

REDMOND PAIRED WATERSHED STUDY

WATER YEAR 2018 DATA SUMMARY REPORT

**Prepared for
City of Redmond**

**Prepared by
Herrera Environmental Consultants, Inc.**



Note:

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REDMOND PAIRED WATERSHED STUDY

WATER YEAR 2018 DATA SUMMARY REPORT

**Prepared for
City of Redmond
15670 Northeast 85th Street
Redmond, Washington 98052**

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September 9, 2019

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INTRODUCTION

The Redmond Paired Watershed Study (RPWS) is one of several effectiveness monitoring studies that was selected for implementation starting in 2014 for the Stormwater Action Monitoring (SAM) program for Puget Sound. The goal of effectiveness monitoring under the SAM program is to provide widely applicable information for improving stormwater management in the region. Phase I and Phase II Municipal Stormwater Permittees in the Puget Sound Region contribute to a Pooled Stormwater Resources Fund that supports the SAM program and associated effectiveness monitoring studies. Selection of the RPWS for implementation under the SAM program was made based on a monitoring proposal that was presented to permittee representatives at workshops that were held on March 20, 2014, and May 6, 2014. The specific study question to be addressed through the RPWS is as follows:

How effective are watershed rehabilitation efforts at improving receiving water conditions at the watershed scale?

To address this study question, a conceptual experimental design for the RPWS was subsequently developed and summarized in the *Redmond Paired Watershed Study Experimental Design Report* (Herrera 2015a). This conceptual experimental design was informed by a literature review (Herrera 2015b) that was conducted to identify lessons learned from past studies that have been implemented to achieve similar objectives. The conceptual experimental design was also developed based on input from a technical advisory committee that was formed for the study. This technical advisory committee includes representation from the following jurisdictions and agencies:

City of Redmond

City of Seattle

King County

Kitsap County

US Environmental Protection Agency

US Geological Society

Washington State Department of Ecology (Ecology)

Building on this previous work, a Quality Assurance Project Plan (QAPP) was developed to guide the implementation of all subsequent phases of the RPWS (Herrera 2015c). This QAPP

documents the experimental design and procedures that will be used during data collection, processing, and analysis to ensure all results obtained for the RPWS are scientifically defensible.

Monitoring pursuant to this QAPP initiated in 2016 and is anticipated to continue for a 10-year timeframe. Data summary reports will be prepared on an annual basis over this period to summarize compiled monitoring data collected through each of the major components of the RPWS. These reports will also document any quality assurance issues associated with these data and resultant limitations (if any) on their use or interpretation. Finally, these reports will document all rehabilitation efforts that have been implemented by the City of Redmond (City) or King County (County) over the previous year. Included will be detailed information on the design and operational status of structural stormwater controls and the frequency and geographic extent of nonstructural stormwater control implementation. Each annual data summary report will document this information based on monitoring that was conducted over the previous water year (i.e., October through September). Data summary reports (Herrera 2017, 2018) were prepared previously for data collected over water year 2016 (WY2016) and water year 2017 (WY2017), respectively.

In years 4, 6, 8, and 10 of the RPWS' implementation, trend analyses reports will also be prepared as companion documents to the data summary reports described above. These reports will summarize the results of statistical analyses that will be performed on the compiled data from all previous years of monitoring to detect potential relationships between rehabilitation efforts and improved receiving water conditions. Each report will also present major conclusions from these analyses.

This document represents the data summary report for monitoring that occurred over water year 2018 (WY2018) for the RPWS. It is organized to include the following sections:

- **Background** – An explanation of why the project is needed
- **Experimental Design** – The sampling process design for the study, including sample types, monitoring locations, and sampling frequency
- **Sampling Procedures** – A description of any major deviations from the sampling procedures that were identified in the QAPP for the study (Herrera 2015c).
- **Rehabilitation Effort Summary** – A description of all watershed rehabilitation efforts that were implemented by the City or County over the preceding water year.
- **Monitoring Results Summary** – A summary of compiled monitoring data collected through each of the major components of the study over the preceding water year.

BACKGROUND

Municipal Stormwater Permits are issued by Ecology to regulate discharges from separated storm sewers owned or operated by Phase I and Phase II cities and counties. The Municipal Stormwater Permits establish the minimum requirements for permittees to address existing and future impacts to receiving waters from urbanization. Municipal Stormwater Permits require cities and counties to execute programmatic (nonstructural) activities and establish design standards for stormwater structural controls triggered by development (onsite stormwater management, runoff treatment, and flow control facilities). In theory, if all developed land in a watershed is equipped with nonstructural and structural stormwater controls, the receiving water would be protected from hydrologic and water quality impacts caused by urbanization. However, while the effectiveness of nonstructural and structural controls has been well documented at the site and parcel scale, limited data exists on the effectiveness of these controls in aggregate for improving conditions in receiving waters at the watershed scale (Herrera 2015b).

In February 2014, Ecology approved a Citywide Watershed Management Plan (WMP) (Herrera 2013) for the City that coordinates stormwater management efforts from the Municipal Stormwater Permit, Section 303(d) of the Clean Water Act, and salmon recovery to allow use of a watershed approach for improving receiving water conditions. Through the implementation of this WMP, the City will focus stormwater best management practices (BMPs) in a subset of priority watersheds that are moderately impacted by urbanization and therefore expected to respond more quickly to rehabilitation efforts. This provides a unique opportunity to study the effectiveness of stormwater BMPs for improving receiving water conditions on an accelerated time frame and at a watershed scale. Recognizing this opportunity, the City is implementing the RPWS to quantify improvements in receiving water conditions with support from the SAM program.

EXPERIMENTAL DESIGN

As described in the *Introduction* to this report, the specific study question to be addressed through the RPWS is as follows:

How effective are watershed rehabilitation efforts at improving receiving water conditions at the watershed scale?

In this context, rehabilitation efforts could include any of the following practices:

- Stormwater management retrofits in upland areas that would include facilities for onsite stormwater management (e.g., low impact development [LID] practices), runoff treatment, and flow control
- Riparian and in-stream habitat improvements
- Programmatic practices for stormwater management

To answer the study question identified above, the experimental design for the RPWP has two primary components:

- **Status and Trends Monitoring:** Routine and continuous measurements of various hydrologic, chemical, physical habitat, and biological indicators of stream health over an extended time frame to quantify improvements in receiving water conditions in response to watershed rehabilitation efforts.
- **Effectiveness Monitoring:** Measurements of hydrologic and chemical parameters over a relatively short timeframe to document the effectiveness of specific structural stormwater controls that have been constructed to improve receiving water conditions.

The Status and Trends Monitoring utilizes a “paired watershed” experimental design that involves collecting these measurements in seven watersheds categorized as follows:

- Three “Application” watersheds with wadeable lowland streams that are moderately impacted by urbanization and prioritized for rehabilitation efforts.
- Two “Reference” watersheds with relatively pristine wadeable lowland streams that do not require rehabilitation.
- Two “Control” watersheds with wadeable lowland streams that are significantly impacted by urbanization and not currently prioritized for rehabilitation.

Table 1 identifies the name, predominant land use/cover, and size of each watershed; the location of all the watersheds is shown in Figure 1. A detailed summary of conditions within each watershed is also provided in the QAPP that was prepared for the study (Herrera 2015c) with information on planned rehabilitation efforts in the Application watersheds as applicable.

| Table 1. Application, Reference, and Control Watersheds for the Redmond Paired Watershed Study. | | | | |
|--|-----------------------|--------------------------------|-------------------------------------|--|
| Watershed Name | Watershed Type | Dominant Land Use/Cover | Watershed Total Area (acres) | Watershed Area Inside Redmond (acres) |
| Evans Creek Tributary 108 | Application | Residential | 397 | 0 ^a |
| Monticello Creek | Application | Residential/Commercial | 345 | 264 |
| Tosh Creek | Application | Residential/Commercial | 299 | 276 |
| Colin Creek | Reference | Forest | 1,990 | 90 |
| Seidel Creek | Reference | Forest | 1,188 | 615 |
| Country Creek | Control | Residential/Commercial | 212 | 212 |
| Tyler's Creek | Control | Residential/Commercial | 168 | 167 |

^a Watershed is in unincorporated King County.

Fixed monitoring stations were established in each watershed for monitoring various indicators of stream health. Due to the scale of the RPWP and the anticipated lag between applying stormwater controls and resultant improvements in receiving water conditions, quantifying a cause and effect relationship between these events may take many years. Therefore, monitoring at the fixed monitoring stations will occur over an anticipated 10-year timeframe. Furthermore, because the effectiveness of watershed rehabilitation practices (e.g., stormwater retrofits, in-stream habitat improvements, and programmatic practices) may vary for different types of receiving water impairments, a broad suite of indicators for assessing potential improvements are being monitored within the following categories: hydrologic, water quality, physical habitat, sediment quality, and biological. The pattern of interest will be evidence that receiving water conditions are improving based on one or more of these indicators in the Application watersheds while conditions in the Reference and Control watersheds remain relatively static.

The following subsections provide more detailed information on the Status and Trends Monitoring and Effectiveness Monitoring, respectively, including the monitoring stations, measurement frequency, indicators, and data analysis methods where applicable.

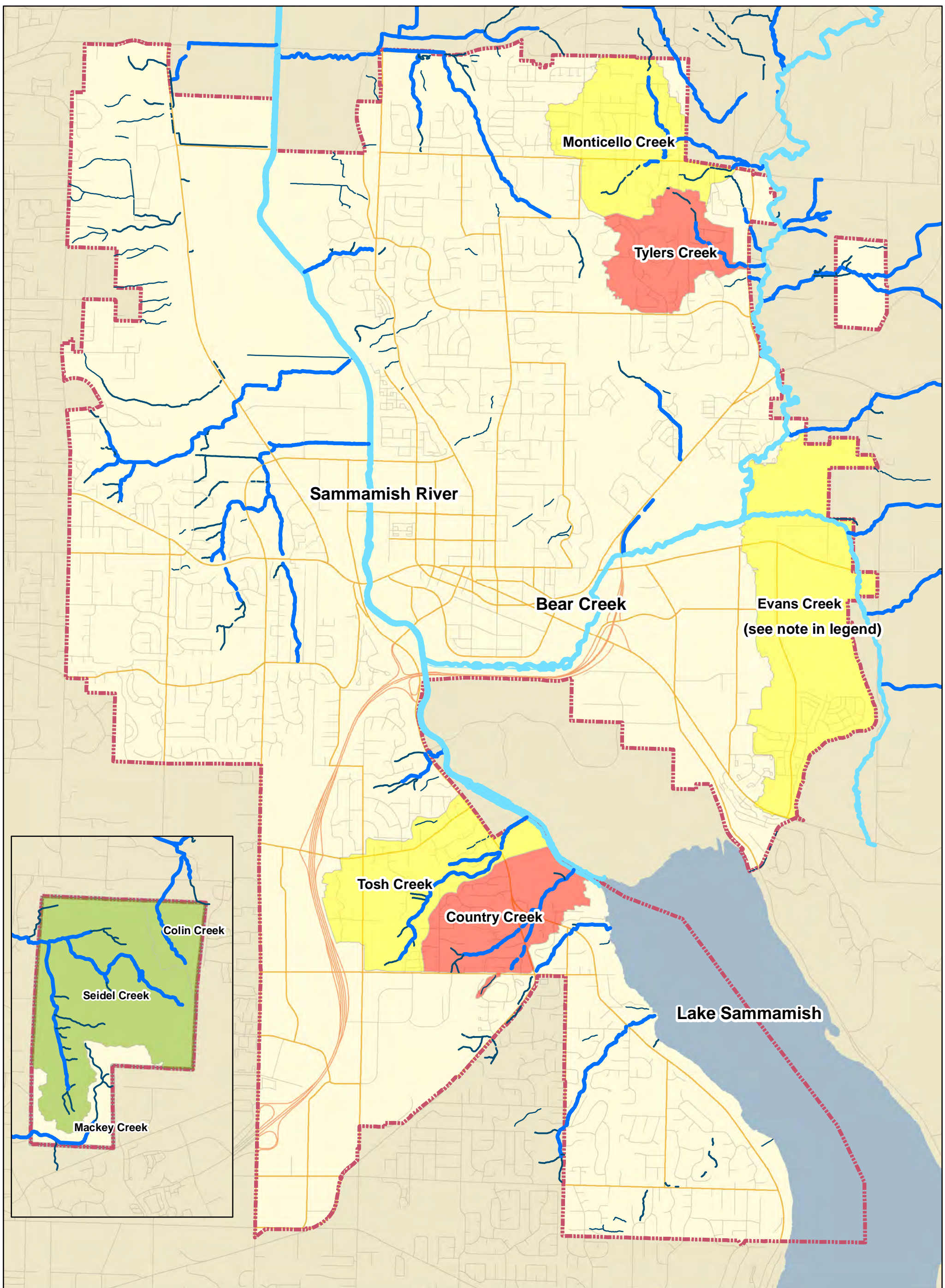
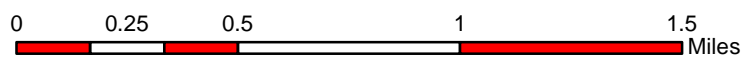


Figure 1. Application, Reference, and Control Watersheds.

City of Redmond, Washington
06/18/2015



Legend

- Class I Stream
- Class II Stream
- Class III Stream
- Class IV Stream
- City Limits
- Reference Watersheds
- Application Watersheds
- Control Watersheds

This figure shows Evans Creek watershed within Redmond. Evans 108 is east of Redmond and illustrated in Figure 2.

Disclaimer: This map is created and maintained by the Natural Resources Division of the City of Redmond, Washington, for reference purposes only. The City makes no guarantee as to the accuracy or completeness of the features shown on this map.

STATUS AND TRENDS MONITORING

This section describes the monitoring stations, measurement frequency, indicators, and data analysis methods that will be used for the Status and Trends Monitoring component of the RPWS. This information is organized under separate subsections for the following monitoring categories: hydrologic, water quality, physical habitat, sediment quality, and biological. The specific indicators of stream health that will be evaluated in these categories are also summarized in Table 2 with their associated measurement frequency.

| Table 2. Indicators of Stream Health for the Redmond Paired Watershed Study. | | |
|---|---|--|
| Indicator | Measurement Frequency | |
| Hydrology Monitoring | | |
| Flow | Continuous | |
| High pulse count | Post-processed from continuous flow measurements | |
| High pulse duration | | |
| High pulse range | | |
| Low pulse count | | |
| Low pulse duration | | |
| Low pulse range | | |
| Flow reversal | | |
| Richards-Baker (RB) flashiness index | | |
| TQ Mean | | |
| Storm flow volume | | |
| Base flow volume | | |
| Total flow volume | | |
| Water Quality Monitoring | | |
| Total suspended solids | Twelve grab samples collected annually during storm events (three each quarter) | |
| Turbidity | | |
| Conductivity | | Four grab samples collected annually during base flow (one each quarter) |
| Hardness | | |
| Dissolved organic carbon | | |
| Fecal coliform bacteria | | |
| Total phosphorus | | |
| Total nitrogen | | |
| Copper, total and dissolved | | |
| Zinc, total and dissolved | | |
| Temperature | Continuous | |
| Conductivity | | |
| Physical Habitat Monitoring | | |
| Bank-full width | Annually | |
| Wetted width | | |
| Cumulative bar width | | |

Table 2 (continued). Indicators of Stream Health for the Redmond Paired Watershed Study.

| Indicator | Measurement Frequency |
|--|--|
| Physical Habitat Monitoring (continued) | |
| Bank-full depth Wetted depth Substrate class Substrate embeddedness Fish cover Thalweg depth Presence of bars Presence of edge pools Main channel slope and bearing Large woody debris tally, including notation of diameter, length, category, zone, and key-pieces Evidence of vegetation colonization below OHWM that persists more than 1 year Slopes vegetated over the crown of the bank Presence of desirable native plant species Presence of invasive plant species Presence of good-habitat indicator liverwort species Channel incision or aggradation Channel widening, narrowing, or migration Changes in channel slope, sinuosity, and/or bed-form type | Annually |
| Sediment Quality Monitoring | |
| Total organic carbon; sieved, 2 mm Copper; sieved, 63 µm Zinc; sieved, 63 µm Polycyclic aromatic hydrocarbons; sieved, 2 mm Phthalates; sieved, 2 mm | Annually |
| Biological Monitoring | |
| Benthic macroinvertebrates | Annually |
| Benthic Index of Biotic Integrity Taxa Richness Ephemeroptera Richness Plecoptera Richness Trichoptera Richness Clinger Percent Long-Lived Richness Intolerant Richness Percent Dominant Predator Percent Tolerant Percent | Post-processed from benthic macroinvertebrate data |

OHWM = Ordinary high water mark

Hydrologic Monitoring

A total of 14 fixed monitoring stations were established to facilitate hydrologic monitoring in each of the study watersheds. As noted in the literature review (Herrera 2001b) that was performed to inform the experimental design for the RPWS, numerous studies have been conducted with similar goals, but they have generally been conducted at the subbasin scale. In these studies, a hydrologic monitoring station was typically located at the outlet of the study subbasin. Therefore, efforts were made to establish hydrologic monitoring stations at the outlet of each of the study watersheds. However, because the watersheds are relatively large and because much of the rehabilitation will occur in the upper reaches of the Application watersheds, efforts were made to establish hydrologic monitoring stations at a mid-point location in each of the study watersheds as well. This goal could not be achieved for all of the study watersheds due to issues relating to their size and drainage patterns. The following deviations are specifically noted:

- Monticello Creek has two major tributaries that will be the target of rehabilitation efforts; therefore, three hydrologic monitoring stations were established in the watershed at the outlet and on each of the tributaries.
- The relatively pristine reach of Colin Creek that was identified for monitoring is confined to the Redmond Watershed Preserve Park. Because the watershed area within this park is relatively small, only one hydrologic monitoring station was established in this study watershed.
- The relatively pristine reach of Seidel Creek that was identified for monitoring is confined to the Redmond Watershed Preserve Park. Within this area, two major tributaries of the creek flow into a large wetland complex near the border of the park. To avoid confounding hydrologic and water quality influences from this wetland, hydrologic monitoring stations were established on each tributary; and no outlet station was identified.

In addition to these considerations, the specific location of each monitoring station was also influenced by safety and property access issues. The monitoring stations established in each of the study watersheds are as follows:

Application Watersheds

- Evans Creek Tributary 108: Two stations designated Lower Stream Station (EVALSS) and Midstream Station (EVAMS), respectively (see locations in Figure 2).
- Monticello Creek: One station at the mouth designated Mont-Mouth (MONM); one station at the approximate midpoint of the watershed on the north tributary designated Mont-Mid-N (MONMN); and one station at the approximate midpoint of the watershed on the south tributary designated Mont-Mid-S (MONMS) (see locations in Figure 3).
- Tosh Creek: One station at the mouth designated Tosh-Mouth (TOSMO); and one station at the approximate midpoint of the watershed designated Tosh-Mid (TOSMI) (see locations in Figure 4).

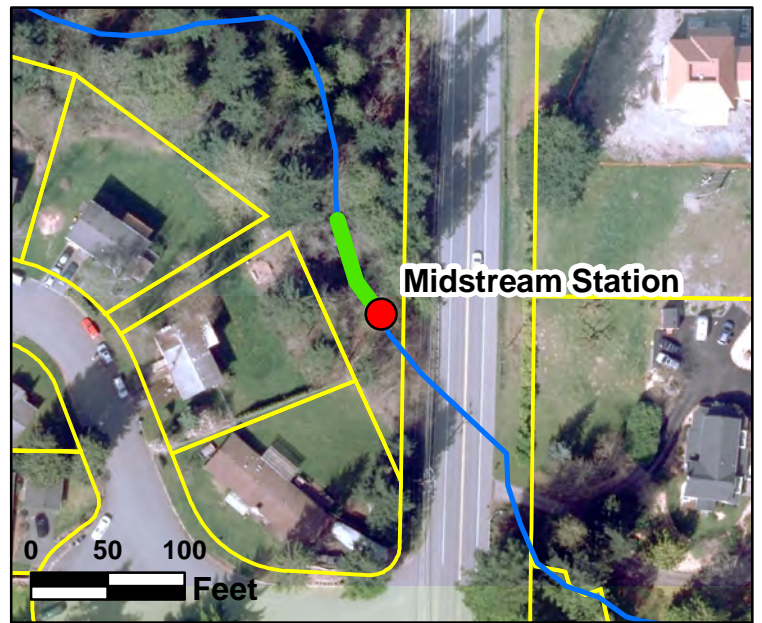
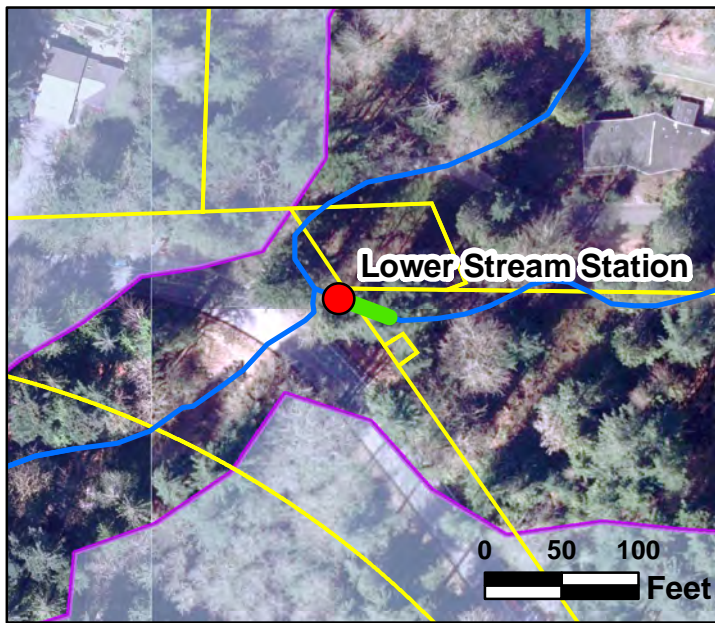
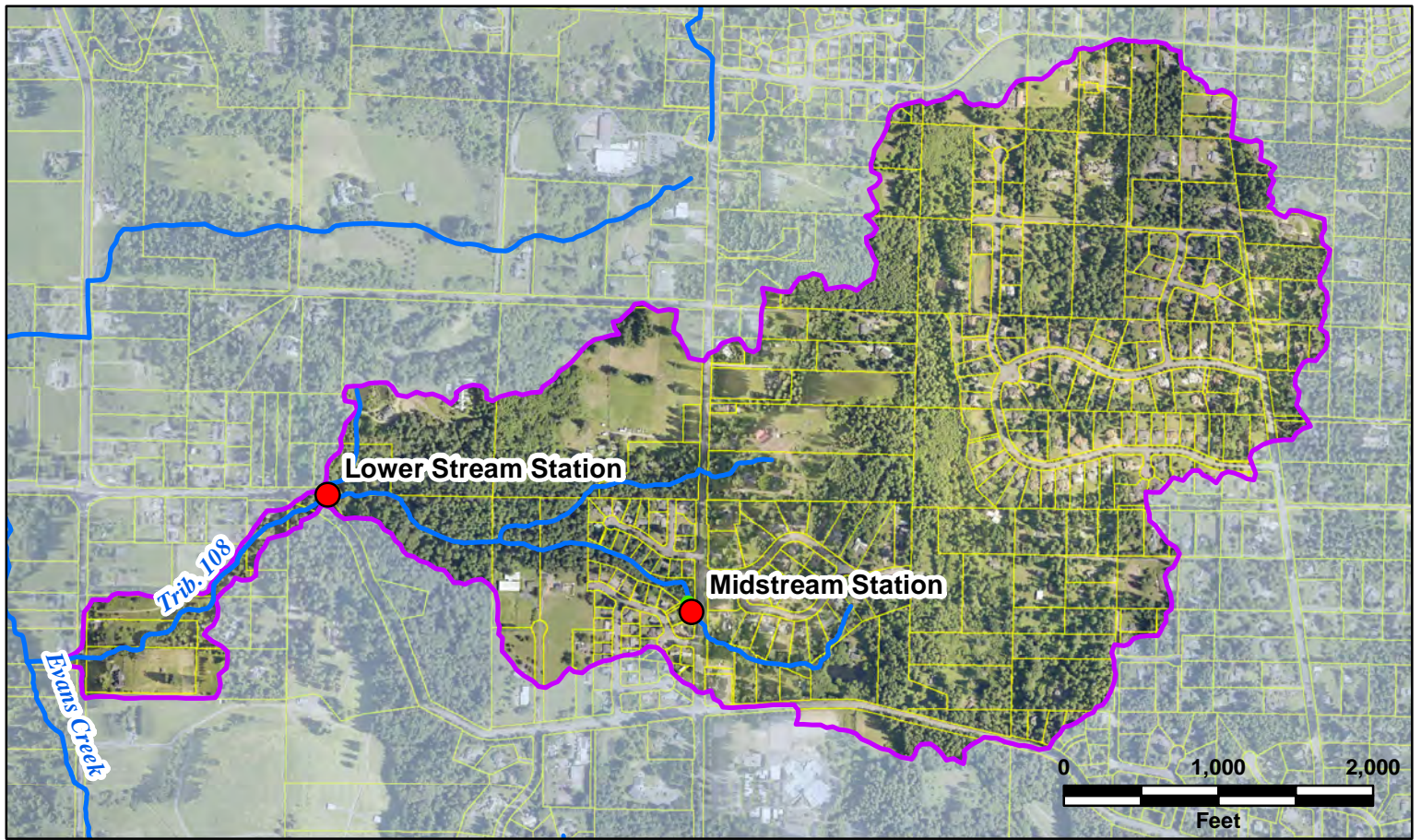


Figure 2. Evans Trib. 108 Paired Watershed Study Monitoring Locations.

King County, Washington

Dec. 17, 2015



Department of Natural Resources and Parks
Water and Land Resources Division

- Flow and WQ Monitoring
- Habitat, Biological, and Sediment Monitoring
- ~ Streams and Rivers
- King County Parcels
- Basin Boundary

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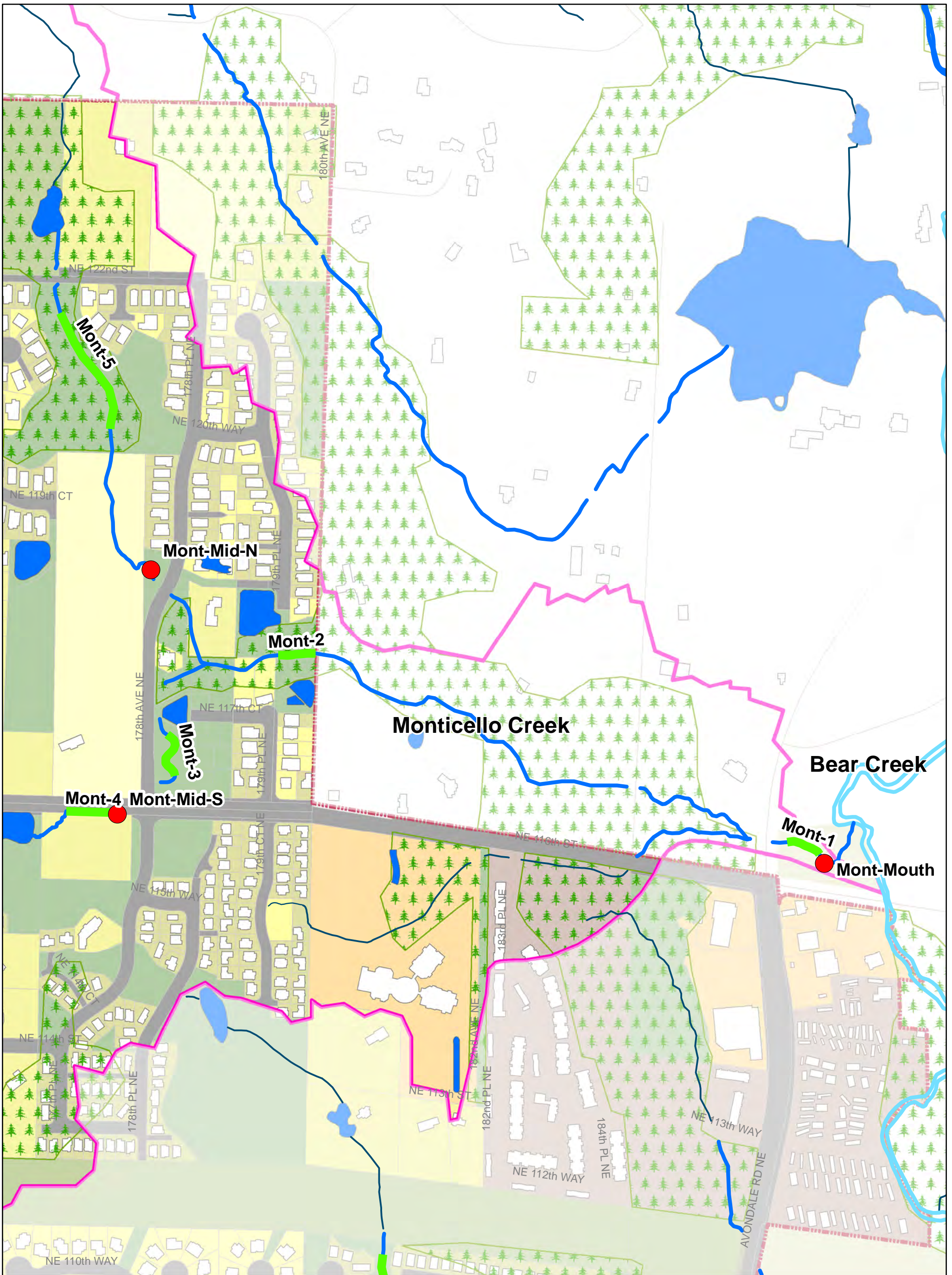


Figure 3. Monticello Creek Paired Watershed Study Monitoring Locations.

City of Redmond, Washington
6/25/2015

0 0.0375 0.075 0.15 Miles

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Legend

- Class I Stream
- Class II Stream
- Class III Stream
- Class IV Stream
- Ponds
- City Limits
- Watershed Boundary
- Commercial
- Industrial
- Multifamily
- Park / Undeveloped
- Public ROW
- Single Family High Density
- Single Family Low Density
- Single Family Medium Density
- Single Family Rural Density
- Flow & WQ Monitoring
- Habitat, Sediment & Biological Monitoring

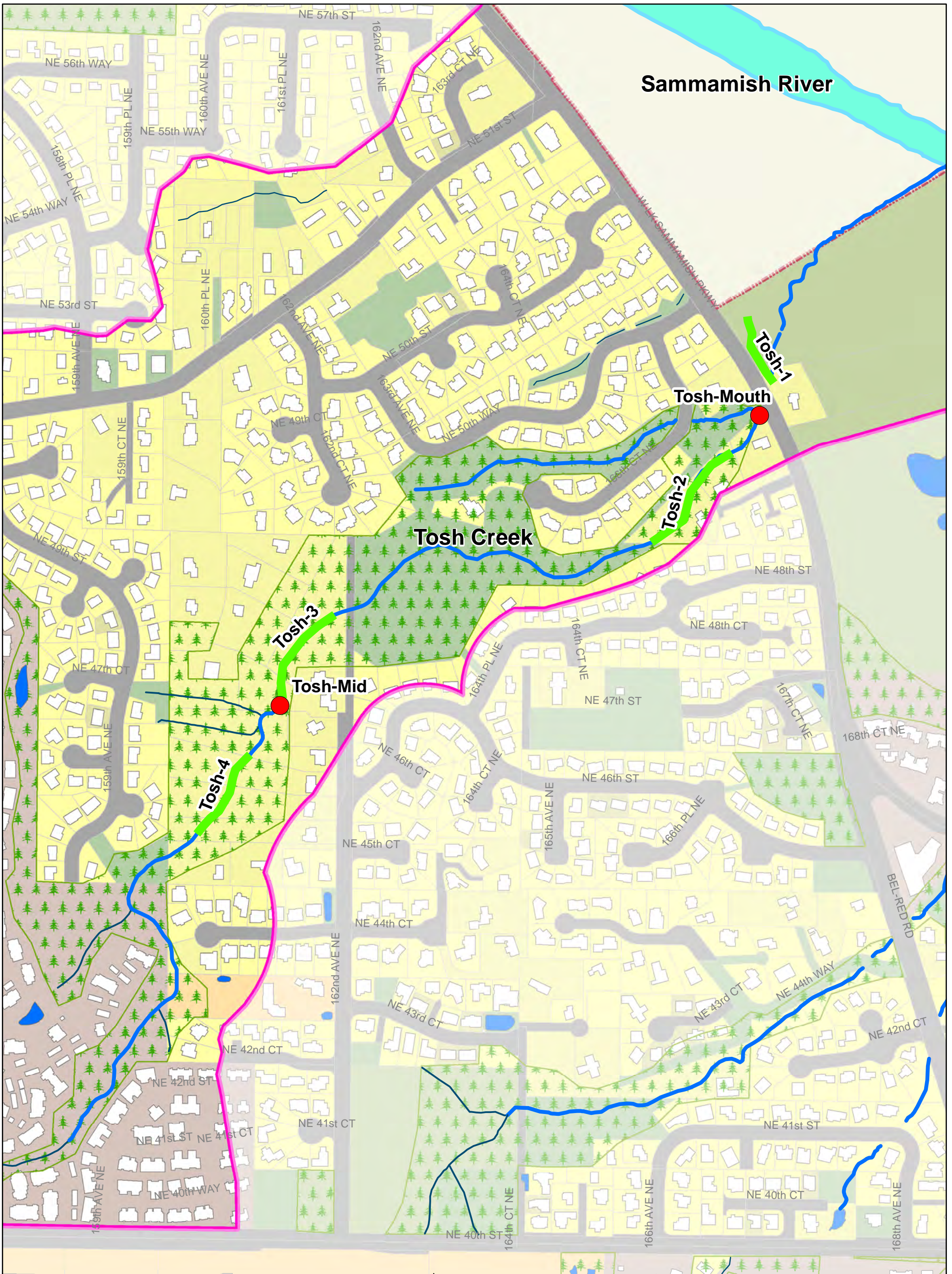


Figure 4. Tosh Creek Paired Watershed Study Monitoring Locations.

City of Redmond, Washington
11/22/2013



0 0.0375 0.075 0.15 Miles



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Legend

- | | | | |
|--------------------|--------------------|------------------------------|---|
| Class I Stream | Commercial | Single Family High Density | Hydrology & WQ Monitoring |
| Class II Stream | Industrial | Single Family Low Density | Physical Habitat, sediment & B-IBI Monitoring |
| Class III Stream | Multifamily | Single Family Medium Density | |
| Class IV Stream | Park / Undeveloped | Single Family Rural Density | |
| Ponds | Public ROW | | |
| City Limits | | | |
| Watershed Boundary | | | |

Reference Watersheds

- Colin Creek: One station at the approximate midpoint of the watershed designated Colin-Mid (COLM) (see locations in Figure 5).
- Seidel Creek: One station at the approximate midpoint of the watershed on the north tributary designated Seidel-Mid-N (SEIMN); one station at the approximate midpoint of the watershed on the south tributary designated Seidel-Mid-S (SEIMS) (see locations in Figure 6).

Control Watersheds

- Country Creek: One station at the mouth designated Country-Mouth (COUMO); and one station at the approximate midpoint of the watershed designated Country-Mid (COUMI) (see locations in Figure 7).
- Tyler's Creek: One station at the mouth designated Tylers-Mouth (TYLMO); and one station at the approximate midpoint of the watershed designated Tylers-Mid (TYLMI) (see locations in Figure 8).

Continuous flow monitoring will occur at all 14 monitoring stations for the duration of the RPWS. Data from the continuous flow monitoring will be processed to calculate the following indicators for evaluating hydrologic impacts from urban development as described in DeGasperi et al. (2009):

- **High flow pulse:** Occurrence of daily average flows that are equal to or greater than a threshold set at twice (two times) the long-term daily average flow rate.
 - **High pulse count:** Number of days each water year that discrete high flow pulses occur.
 - **High pulse duration:** Annual average duration (in days) of high flow pulses during a water year.
 - **High pulse range:** Range in days between the start of the first high flow pulse and the end of the last high flow pulse during a water year.
- **Low pulse count:** Occurrence of daily average flows that are equal to or less than a threshold set at 50 percent of the long-term daily average flow rate.
 - **Low pulse count:** Number of times each calendar year that discrete low flow pulses occurred.
 - **Low pulse duration:** Annual average duration (in days) of low flow pulses during a calendar year.

- **Low pulse range:** Range in days between the start of the first low flow pulse and the end of the last low flow pulse during a calendar year.
- **Flow Reversal:** The number of times that the flow rate changed from an increase to a decrease or vice versa during a water year. Flow changes of less than 2 percent are not considered.
- **Richards-Baker (RB) flashiness index:** A dimensionless index of flow oscillations relative to total flow based on daily average discharge measured during a water year.
- **TQ Mean:** The fraction of a year that mean daily discharge exceeds annual mean discharge.
- **Storm flow volume:** Total discharge volume during storm events over a water year.
- **Base flow volume:** Total discharge volume during base flow over a water year.
- **Total flow volume:** Total discharge volume over a water year.

Trends over time at each monitoring station will be evaluated using parametric (Pearson's r) and nonparametric (Kendall's tau or Spearman's rho) tests of correlation between these indicators and time. Statistical significance of the correlation coefficients will be evaluated based on an α -level of 0.05 for a one-tailed test. The pattern of interest will be evidence that receiving water conditions are improving based on the detection of statistically significant trends in the data for one or more of these indicators in the Application watersheds while these same trends are not detected in the data for the same indicators in the Reference and Control watersheds.

In addition to the correlation analyses, separate analyses will be performed to compare measured flows in Tosh Creek and Monticello Creek to modeled flows for forested and existing conditions in these watersheds that were derived using Hydrological Simulation Program—Fortran (HSPF) models. For these analyses, local rainfall data collected concurrently with the measured flows will serve as model input for predicting flows for forested and existing conditions. Using a custom program that is described in the QAPP for the study (Herrera 2015c), both the measured and modeled flows will be post-processed to delineate individual periods of base and storm flow, respectively, across the entire time series for a given water year. Separate statistical analyses (Paired Wilcoxon signed rank tests or Paired T-tests) will then be performed to determine if measured peak flows and flow volumes, respectively, during storm flow are significantly different from modeled flows for either the forested or existing conditions. Statistical significance in these tests will be evaluated based on an α -level of 0.05 for a one-tailed test. If watershed rehabilitation efforts are effective, measured peak flows and flow volumes should depart from the modeled equivalent for existing conditions and more closely resemble those for forested conditions.

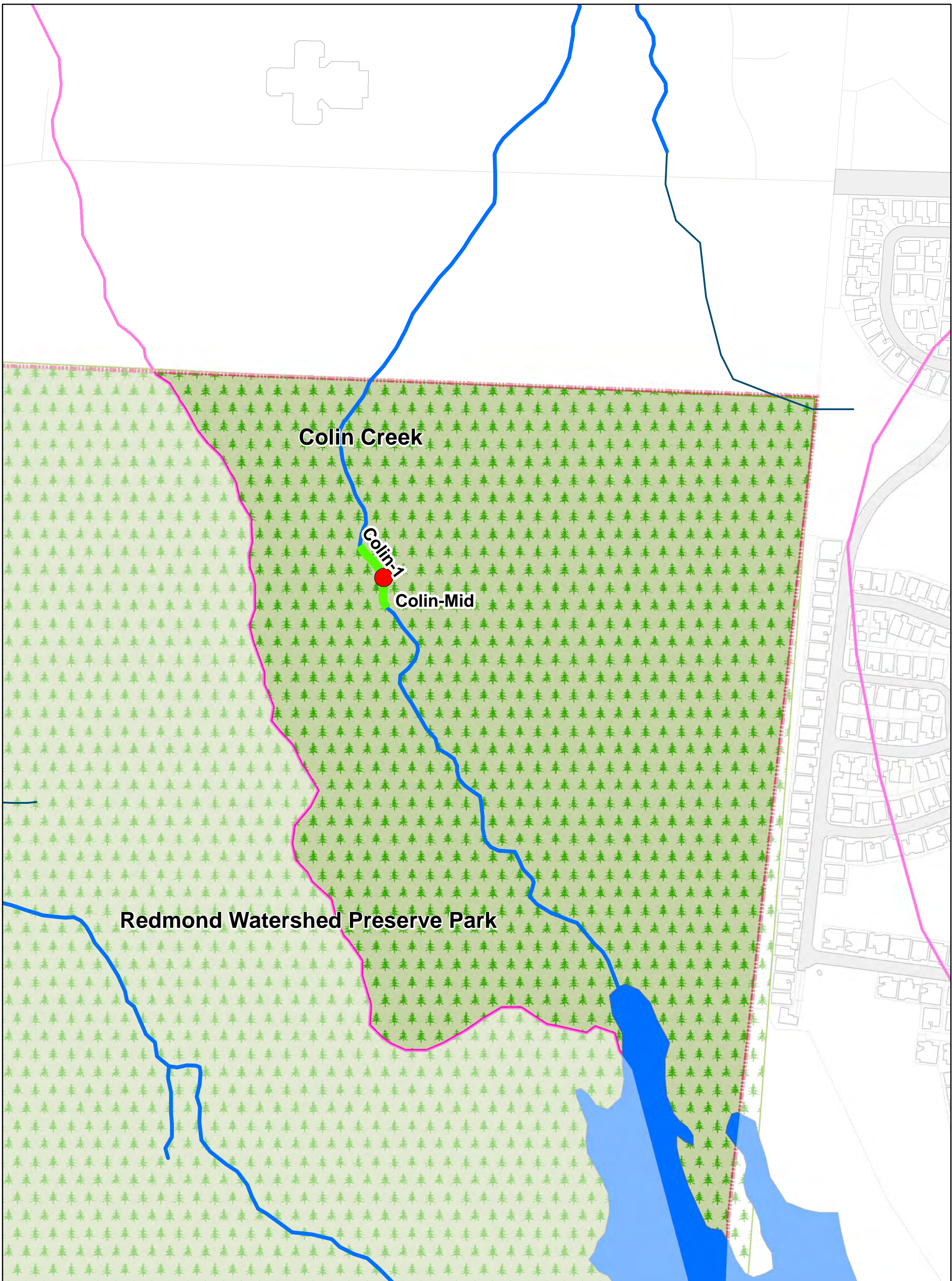


Figure 5. Colin Creek Paired Watershed Study Monitoring Locations.

City of Redmond, Washington
6/25/2015



0 0.0325 0.065 0.13 Miles

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Legend

- | | | | |
|--------------------|--------------------|------------------------------|---|
| Class I Stream | Commercial | Single Family High Density | Flow & WQ Monitoring |
| Class II Stream | Industrial | Single Family Low Density | Habitat, sediment & Biological Monitoring |
| Class III Stream | Multifamily | Single Family Medium Density | |
| Class IV Stream | Park / Undeveloped | Single Family Rural Density | |
| Ponds | Public ROW | | |
| City Limits | | | |
| Watershed Boundary | | | |

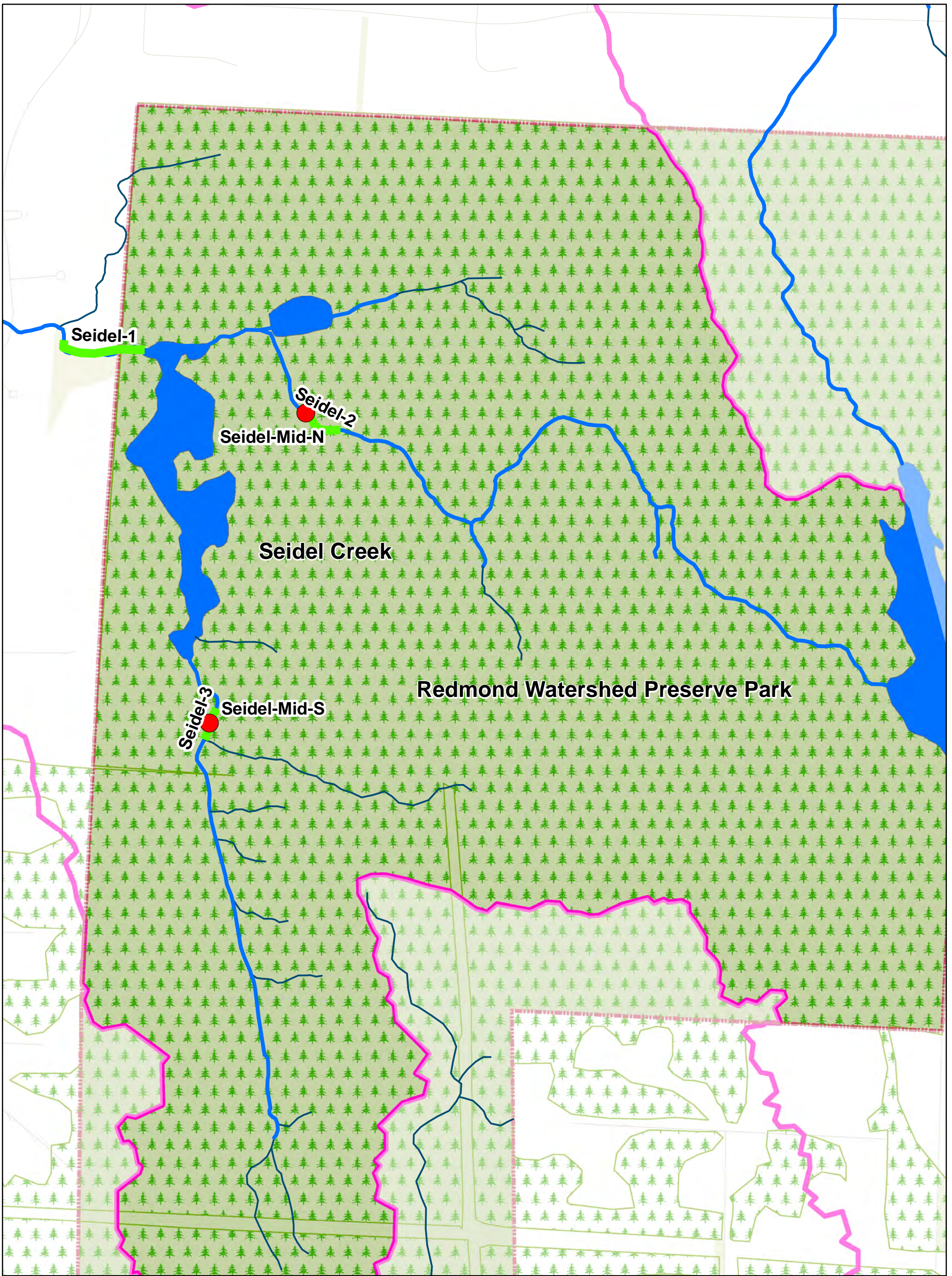


Figure 6. Seidel Creek Paired Watershed Study Monitoring Locations.

City of Redmond, Washington
11/22/2013



0 0.05 0.1 0.2 Miles

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Legend

- | | | | |
|--------------------|--------------------|------------------------------|---|
| Class I Stream | Commercial | Single Family High Density | Flow & WQ Monitoring |
| Class II Stream | Industrial | Single Family Low Density | Habitat, Sediment & Biological Monitoring |
| Class III Stream | Multifamily | Single Family Medium Density | |
| Class IV Stream | Park / Undeveloped | Single Family Rural Density | |
| Ponds | Public ROW | | |
| City Limits | | | |
| Watershed Boundary | | | |

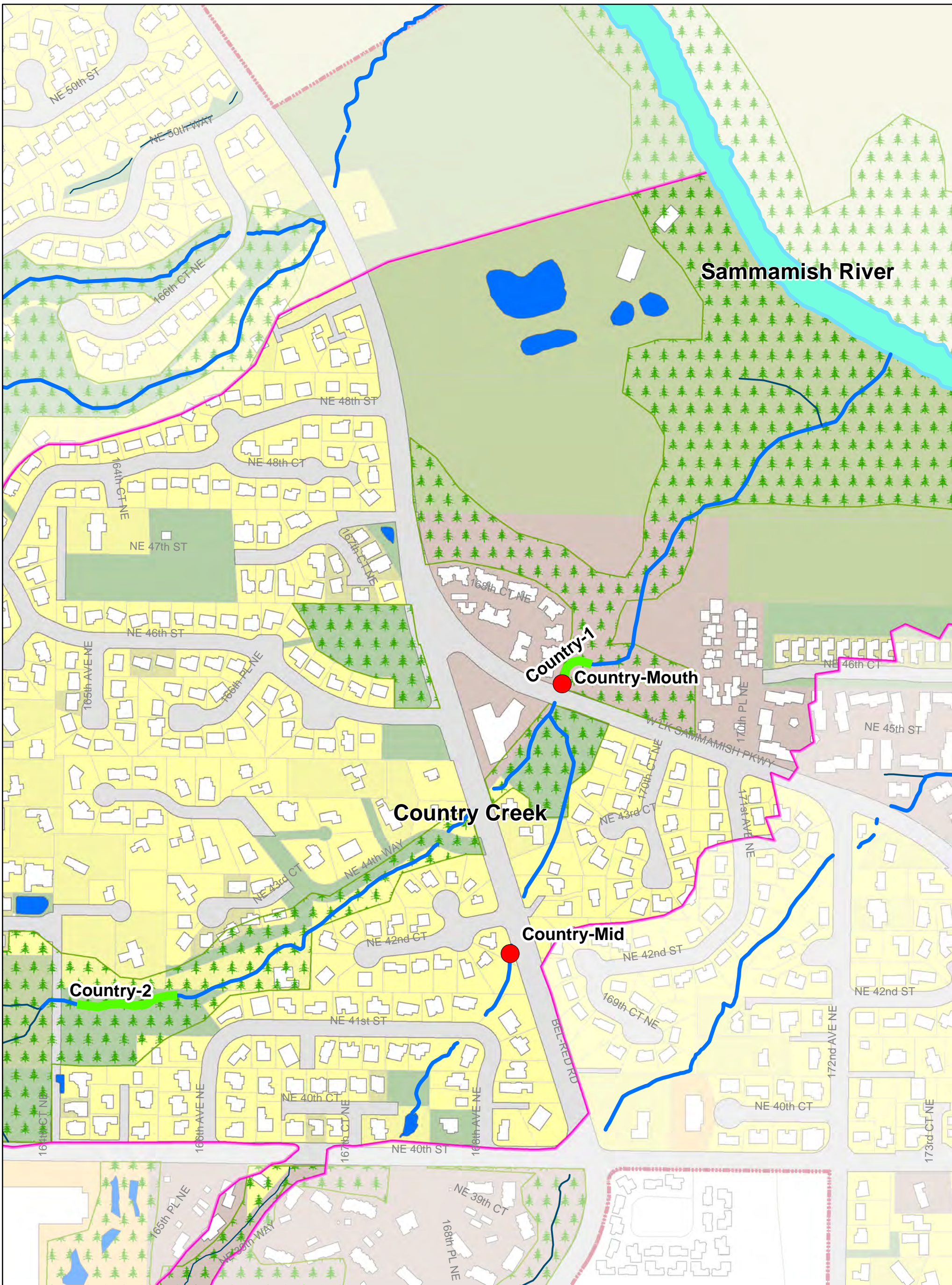


Figure 7. Country Creek Paired Watershed Study Monitoring Locations.

City of Redmond, Washington
6/25/2015



0 0.0325 0.065 0.13 Miles

Disclaimer: This map is created and maintained by the Natural Resources Division of the City of Redmond, Washington, for reference purposes only. The City makes no guarantee as to the accuracy or completeness of the features shown on this map.

Legend

- | | | | |
|--------------------|--------------------|------------------------------|--|
| Class I Stream | Commercial | Single Family High Density | Flow & WQ Monitoring |
| Class II Stream | Industrial | Single Family Low Density | Habitat, Sediment, & Biological Monitoring |
| Class III Stream | Multifamily | Single Family Medium Density | |
| Class IV Stream | Park / Undeveloped | Single Family Rural Density | |
| Ponds | Public ROW | | |
| City Limits | | | |
| Watershed Boundary | | | |

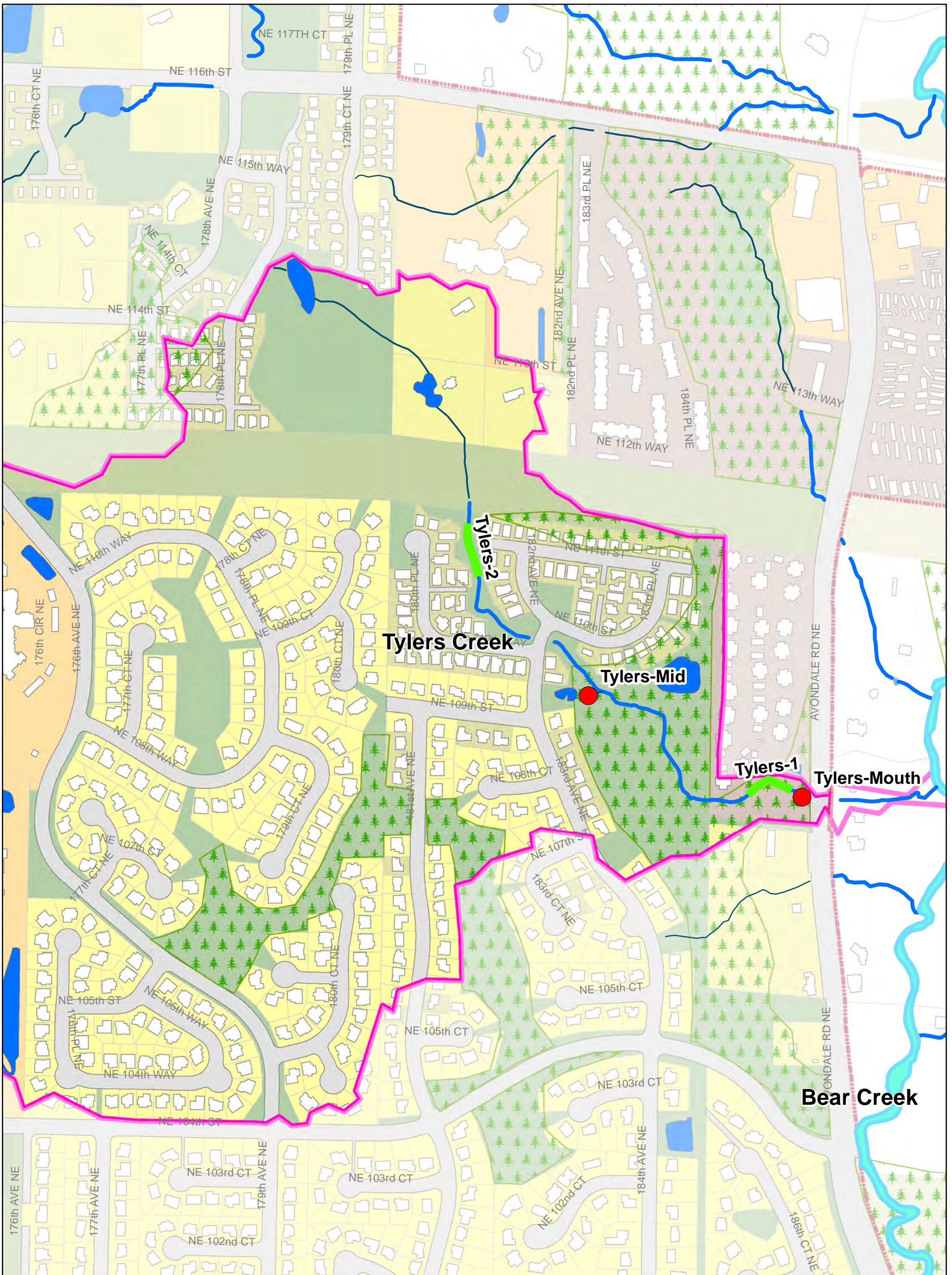


Figure 8. Tyler's Creek Paired Watershed Study Monitoring Locations.

City of Redmond, Washington
6/25/2015



0 0.0375 0.075 0.15 Miles



Disclaimer: This map is created and maintained by the Natural Resources Division of the City of Redmond, Washington, for reference purposes only. The City makes no guarantee as to the accuracy or completeness of the features shown on this map.

Legend

- | | | | |
|--------------------|--------------------|------------------------------|---|
| Class I Stream | Commercial | Single Family High Density | Flow & WQ Monitoring |
| Class II Stream | Industrial | Single Family Low Density | Habitat, Sediment & Biological Monitoring |
| Class III Stream | Multifamily | Single Family Medium Density | |
| Class IV Stream | Park / Undeveloped | Single Family Rural Density | |
| Ponds | Public ROW | | |
| City Limits | | | |
| Watershed Boundary | | | |

Water Quality Monitoring

A total of 14 fixed monitoring stations were established to facilitate water quality monitoring in each of the study watersheds. These stations were co-located with the monitoring stations described above for hydrologic monitoring (see Figures 2 through 8). Twelve grab samples will be collected annually during storm events (three each quarter) at all 14 monitoring stations for the duration of the RPWS. In addition, four grab samples will also be collected annually during base flow (one each quarter) at these stations. Each sample will be analyzed for the following indicators for evaluating water quality impacts from urban development:

- Total suspended solids
- Turbidity
- Conductivity
- Hardness
- Dissolved organic carbon
- Fecal coliform bacteria
- Total phosphorus
- Total nitrogen
- Copper, total and dissolved
- Zinc, total and dissolved

In addition, *in situ* probes will be used to continuously measure temperature at each station and conductivity at the following subset of stations: EVALSS, EVAMS, MONM, MONMS, TOSMO, SEIMN, SEIMS, COUMO, and TYLMO.

Trends over time at each monitoring station will be evaluated using parametric (Pearson's r) and nonparametric (Kendall's tau or Spearman's rho) tests of correlation between these indicators and time. Where possible, variation in the indicator data related to changes in stream flow will be removed prior to performing the correlation analyses using methods described in Helsel and Hirsch (2002). Use of these methods is generally applicable for indicators that tend to increase (or decrease) as a function of flow (e.g., total suspended solids). By removing this variation, trends in the indicator data can be more readily detected in the correlation analyses. In all cases, statistical significance of the correlation coefficients will be evaluated based on an α -level of 0.05 for a one-tailed test.

The sample frequency identified above for water quality monitoring was evaluated using power tests that were performed for totals suspended solids and total zinc. Power tests are used to determine the probability of detecting a trend given: 1) sample size, 2) the desired α -level, 3) magnitude of the trend, and 4) amount of variation within the data. With 16 samples collected annually (12 samples during storm events and 4 samples during base flow) over a 10-year period and a desired α -level of 0.05, results from these tests showed there was a 66 to 100 percent probability of detecting a 4 milligram per liter (mg/L) decrease in total suspended solids concentrations depending on the variability that is assumed for the data and characteristics of the trend over time (i.e., linear or non-linear). These same tests showed there is a 38 to 100 percent probability of detecting a 2 microgram per liter ($\mu\text{g/L}$) decrease in total zinc concentrations. Results from these tests are documented in the QAPP that was prepared for the study (Herrera 2015c).

Annual mass load estimates will also be derived for the following subset of indicators using the nonparametric “smearing” approach described in Helsel and Hirsch (2002): total suspended solids, total phosphorus, total nitrogen, total copper, and total zinc. Trends over time at each monitoring station will again be evaluated using parametric (Pearson’s r) and nonparametric (Kendall’s tau or Spearman’s rho) tests of correlation between these mass load estimates and time. Statistical significance of the correlation coefficients will be evaluated based on an α -level of 0.05 for a one-tailed test. These analyses will be used to detect potential improvements in receiving water conditions from the combined effects of improved water quality and reduced stormwater runoff.

In all cases, the pattern of interest will be evidence that receiving water conditions are improving based on the detection of statistically significant trends in the data for one or more of these indicators in the Application watersheds while the same trends are not detected in the data for the same indicators in the Reference and Control watersheds.

Physical Habitat Monitoring

A total of 19 fixed monitoring stations were established to facilitate physical habitat monitoring in each of the study watersheds. As described in the literature review (Herrera 2001b) that was performed to inform the experimental design for the RPWS, most past studies that have been performed to assess physical habitat response to watershed rehabilitation were conducted in reaches where channel rehabilitation measures were directly applied. Consequently, they were designed to only assess the localized effects of these efforts. The RPWS involves both localized channel rehabilitation and watershed scale rehabilitation through the application of structural and programmatic practices for stormwater management. Therefore, a synoptic approach was applied for establishing monitoring stations for physical habitat monitoring where stations were established in the Application watersheds in reaches that will be restored and in reaches where no physical alterations to the channel are planned. In this way, the RPWS can assess physical habitat response to both localized and basin-wide rehabilitation efforts. In addition to these considerations, the specific location of each monitoring station was also influenced by safety

and property access issues. The monitoring stations established in each of the study watersheds are as follows:

Application Watersheds

- Evans Creek Tributary 108: Two stations designated Lower Stream Station (EVALSS) and Midstream Station (EVAMS), respectively (see locations in Figure 2).
- Monticello Creek: Five stations designated Mont-1, Mont-2, Mont-3, Mont-4, and Mont-5, respectively (see locations in Figure 3).
- Tosh Creek: Four stations designated Tosh-1, Tosh-2, Tosh-3, and Tosh-4, respectively (see locations in Figure 4).

Reference Watersheds

- Colin Creek: One designated Colin-1 (see locations in Figure 5).
- Seidel Creek: Three stations designated Seidel-1, Seidel-2, and Seidel-3, respectively (see locations in Figure 6).

Control Watersheds

- Country Creek: Two stations designated Country-1 and Country-2, respectively (see locations in Figure 7).
- Tyler's Creek: Two stations designated Tylers-1 and Tylers-2, respectively (see locations in Figure 8).

The following monitoring stations were specifically selected to measure the localized physical habitat response in reaches that have either been recently restored or are likely to be restored in the future:

- Mont-3
- Mont-4
- Mont-5
- Tosh-1
- Tosh-3
- Tosh-4

Physical habitat monitoring will be conducted annually at each monitoring station for the duration of the RPWS. The characteristic bed-form type will be recorded at each monitoring station as a whole, and physical habitat quality indicators will be measured at 11 cross-sections (transects) and thalweg (line of steepest descent along the streambed) profile for each habitat monitoring station.

The following indicators will be measured at each transect:

- Bank-full width, wetted width, and cumulative bar width
- Bank-full depth, wetted depth, substrate class and embeddedness at 11 or more stations across the section
- Fish cover
- Human influence
- Riparian shading
- Riparian vegetation structure
- Presence of desirable/undesirable plant species

The following indicators will be measured along the thalweg profile:

- Thalweg depth and the presence of bars and/or edge pools
- Large woody debris and habit unit descriptions
- Side-channel descriptions
- Main channel slope and bearing
- Presence, source, size, of culvert or pipes draining to creek

Post-processing of recorded physical habitat indicators will allow monitoring of:

- Channel incision or aggradation
- Channel widening, narrowing, or migration
- Changes in channel slope, sinuosity, and/or bed-form type

The pattern of interest will be evidence that receiving water conditions are improving based on the detection of trends in the data for one or more of these indicators in the Application

watersheds while the same trends are not detected in the data for the same indicators in the Reference and Control watersheds.

Sediment Quality Monitoring

A total of 19 fixed monitoring stations were established to facilitate sediment quality monitoring in each of the study watersheds. These stations were co-located with the monitoring stations described above for physical habitat monitoring (see Figures 2 through 8). Sediment samples will be collected annually at all 19 monitoring stations for the duration of the RPWS. Each sample will be analyzed for the following indicators for evaluating sediment quality impacts from urban development:

- Total organic carbon
- Copper
- Zinc
- Polycyclic aromatic hydrocarbons
- Phthalates

Trends over time at each monitoring station will be evaluated using parametric (Pearson's r) and nonparametric (Kendall's tau or Spearman's rho) tests of correlation between these indicators and time. Statistical significance of the correlation coefficients will be evaluated based on an α -level of 0.05 for a one-tailed test. The pattern of interest will be evidence that receiving water conditions are improving based on the detection of statistically significant trends in the data for one or more of these indicators in the Application watersheds while the same trends are not detected in the data for the same indicators in the Reference and Control watersheds.

Biological Monitoring

A total of 19 fixed monitoring stations were established to facilitate biological monitoring in each of the study watersheds. These stations were co-located with the monitoring stations described above for physical habitat monitoring (see Figures 2 through 8). Benthic macroinvertebrate samples will be collected annually at each monitoring station for the duration of the RPWS. Each sample will be processed to calculate the following indicators for use in evaluating stream health:

- Benthic Index of Biotic Integrity (B-IBI)
- Taxa Richness
- Ephemeroptera Richness

- Plecoptera Richness
- Trichoptera Richness
- Clinger Percent
- Long-Lived Richness
- Intolerant Richness
- Percent Dominant
- Predator Percent
- Tolerant Percent

Trends over time at each monitoring station will be evaluated using parametric (Pearson's r) and nonparametric (Kendall's tau or Spearman's rho) tests of correlation between these indicators and time. Statistical significance of the correlation coefficients will be evaluated based on an α -level of 0.1 for a one-tailed test. The pattern of interest will be evidence that receiving water conditions are improving based on the detection of statistically significant trends in the data for one or more of these indicators in the Application watersheds while the same trends are not detected in the data for the same indicators in the Reference and Control watersheds.

The sampling frequency identified above for biological monitoring was evaluated using the power tests described above in the *Water Quality Monitoring* subsection. With samples collected annually over a 10-year period and a desired α -level of 0.05, results from these tests showed there was a 63 to 96 percent probability of detecting a 9-unit increase in B-IBI scores (equivalent to a change from "fair" to "good" in biological condition) depending on the variability that is assumed for the data and characteristics of the trend over time (i.e., linear or non-linear). Results from these tests are documented in the QAPP that was prepared for study (Herrera 2015c).

Effectiveness Monitoring

As described above, roving stations will be established for the Effectiveness Monitoring component of the RPWS to verify specific structural stormwater controls are constructed properly and performing as designed. The roving stations will be moved from one year to the next once a facility's effectiveness has been verified and new facilities come online. The specific types of monitoring to be performed at each roving station will depend on the type of structural stormwater control that is being evaluated. For example, it is anticipated that only hydrologic monitoring would be performed at roving stations for facilities that are only designed for flow control (e.g., vaults). In these cases, a facility's performance would be verified based on comparisons of measured flow from the roving station to the facility's predicted flow from models used in its design. For facilities that are designed for runoff treatment, monitoring will follow guidelines from Ecology's Technology Assessment Protocol-Ecology (TAPE) (Ecology

2011) and include both hydrologic (e.g., influent and effluent flow) and water quality monitoring. In these cases, a facility's performance would be verified based on comparisons of its measured pollutant removal efficiency relative to targets that are identified in TAPE for specific treatment categories.

At present, no new structural stormwater controls have come online in an Application watershed that are suitable for Effectiveness Monitoring. For planning purposes, it is anticipated that two separate facilities will be completed and made available for monitoring in year 6 of the study, respectively. For each facility, detailed information on the procedures that will be used for data collection, quality assurance and control, management, and analysis will be provided in separate addendums to the QAPP that was prepared for the study (Herrera 2015c).

REHABILITATION EFFORT SUMMARY

As noted in the previous section, the pattern of interest for this study will be evidence that receiving water conditions are improving based on one or more indicators in the Application watersheds while conditions in the Reference and Control watersheds remain relatively static. To increase the likelihood of detecting this trend, conditions in the Application watersheds were characterized over a "baseline" period prior to the implementation of any rehabilitation efforts that generally spanned WY2016. Rehabilitation efforts that have subsequently been implemented by the City or County in each of the Application watersheds are described below.

Evans Creek Tributary 108:

- In WY2017, the County constructed two stormwater detention vaults within the Evans Creek Tributary 108 watershed; one was in front of addresses 20620 and 20626 NE 76th Place, and the other was in front of address 20508 NE 78th Street.

Monticello Creek:

- Using funding from a King County WaterWorks grant, the City initiated street sweeping in the Monticello Creek watershed in August of WY2017. The street sweeping initially occurred once a month on all public roads in the watershed. Beginning in October of WY2018, the frequency of street sweeping increased from once per month to twice per month. This street sweeping is being implemented to meet the specific goal of improving water quality in the creek and is being conducted in addition to street sweeping that occurs in the watershed for other operational reasons, such as collecting leaves in fall.
- In WY2017, large woody debris was installed on an approximately 400-foot-long reach of Monticello Creek that extends downstream from NE 122nd Street. Approximately 400 feet of additional large woody debris was installed in July of WY2018 on the downstream end of the installation from WY2017.

Tosh Creek:

- Large woody debris was installed on an approximately 300-foot-long reach of Tosh Creek in WY2017, downstream of West Lake Sammamish Parkway. In July of WY2018, adjustments were made to this large woody debris and minor slash was added to the reach.
- The high flow bypass pipe weir for the Tosh Creek watershed was adjusted in July of WY2017 to divert more high flow stormwater from Tosh Creek.

SAMPLING PROCEDURES

The QAPP that was prepared for the RPWS (Herrera 2015c) provides detailed information on the sampling procedures that are being used for each of the following monitoring categories: hydrologic, water quality, physical habitat, sediment quality, and biological. The following deviations from these sampling procedures are noted for monitoring that took place in WY2018:

- The YSI Pro Model 2030 that was used to make discrete *in situ* measurements of water temperature and conductivity was calibrated using a 1,000 μS standard instead of a 100 μS standard as specified in the QAPP. This change was made based on manufacturer recommendations for meter calibration. Given this change, the calibration of the meter was subsequently checked before and after each sampling event using both the 100 and 1,000 μS standards to confirm the method quality objective identified in the QAPP for meter accuracy (± 5 percent) was met. Results from these calibration checks were documented on standardized field forms.
- Guidelines in the QAPP indicated storm sampling should occur after a period of at least 24 hours preceding the event with less than 0.04 inches of precipitation. However, this guideline was deemed too restrictive following monitoring that occurred over WY2016. Based on input from the SAM program coordinator and technical advisory committee for the RPWS, this criterion was changed to allow storm event sampling after a period of at least 12 hours preceding the event with less than 0.04 inches of precipitation.

MONITORING RESULTS SUMMARY

This section summarizes results for the Status and Trends Monitoring component of the RPWS from monitoring that was conducted over WY2018; as noted previously, no monitoring for the Effectiveness Monitoring component of the study occurred over this period. The presentation of these results is organized under separate subsections for the following monitoring categories: hydrologic, water quality, physical habitat, sediment quality, and biological. As noted in the *Introduction* section of this document, trend analyses reports will be prepared in years 4, 6, 8, and 10 of the RPWS' implementation to summarize the results of statistical analyses that will be performed on the compiled data from all previous years of monitoring to detect potential relationships between rehabilitation efforts and improved receiving water conditions. Therefore, this data summary report does not provide detailed analyses of the monitoring results from WY2018.

HYDROLOGIC MONITORING

Hydrologic monitoring for WY2018 initiated on October 1, 2017, at the 14 fixed monitoring stations that are identified in the *Experimental Design* section of this document and continued through September 30, 2018. In addition, continuous precipitation monitoring occurred over the same period at four separate precipitation monitoring stations: three stations were established for the RPWS – Tosh, Monticello, and Evans; and one station is maintained by the County for other purposes – Trilogy. Each station is used for measuring precipitation in the watershed for a specific creek as follows:

- Tosh station: Tosh Creek and Country Creek
- Monticello station: Tyler Creek and Monticello Creek
- Evans station: Evans Creek
- Trilogy station: Seidel Creek and Colin Creek.

Line plots showing the continuous flow and precipitation data collected at each of these stations (grouped by watershed) are provided in Appendix A. The quality assurance review memorandum for these data is provided in Appendix B, while Appendix C documents the discharge rating curves that were used to estimate flow at each station. In general, the quality assurance review memorandum indicates there were no serious quality assurance problems associated with these data that would impose severe limitations on their use and interpretation. As documented in the quality assurance review memorandum, the continuous flow data at each station was rated as either “fair” or “good” with the following exceptions:

- COUMI: Record poor. Scour and fill at this site necessitates rating shifts. Observed channel hydraulics during the April 14 and 15, 2018, storm made water level record unreliable. The main gage water level sensor seemed to work poorly in May and June so the 15-minute record from the backup sensor was used. Maintenance improved the subsequent readings. Low resolution hydraulic control.
- MONMN: Record poor. Channel not conducive to stable rating. Peak discharge was 23 cubic feet per second (cfs) for the period; the highest flow measurement was 12 cfs. There were many non-storm related discharges to the channel.
- TOSMI: Record poor. The channel here gives a low resolution rating. Access to the site is difficult. Peak recorded discharge was 14 cfs; highest discharge measurement was 5.1 cfs.
- TYLMI: Record poor. Water level measured at the outlet to a 4.5-foot-diameter culvert, behind a rock control. The stream reacts quickly to rainfall due to nearby street runoff directed to the channel. The site has suffered numerous alterations to the channel by unknown parties, which necessitates many rating corrections. Peak recorded discharge was 4.5 cfs; highest discharge measurement was 2.3 cfs.

Finally, there were minor gaps in the continuous flow data at COUMI and SEIMN as shown in Table 3.

| Station | Gap Start Date, Time^a | Gap Stop Date, Time^a | Gap Duration in Hours | Flow Estimation Method |
|----------------|---|--|------------------------------|--|
| COUMI | 4/14/18, 16:00 | 4/15/18, 7:00 | 15.0 | Scaled dated from COLM. |
| SEIMN | 4/8/18, 13:00 | 4/8/18, 14:45 | 1.8 | Freehand correction generating points every 5.0 minutes. |
| SEIMN | 4/12/18, 14:10 | 4/12/18, 17:50 | 3.7 | Freehand correction generating points every 5.0 minutes. |
| SEIMN | 4/19/18, 13:50 | 4/19/18, 18:10 | 4.3 | Freehand correction generating points every 5.0 minutes. |

^a All times are reported as Pacific Standard Time.

To facilitate future analyses of hydrologic trends, the gaps identified in Table 3 were filled using estimated flow data. These estimates were derived by first importing the continuous flow data from all stations into the Aquarius Continuous Data Management System software package (Aquarius software package). Using the Aquarius software package’s built-in capabilities, gaps of fewer than 10 hours were filled using freehand correction and best professional judgement. Longer gaps were filled using models that were developed to estimate missing flow data for one station based on measured flow data from another station having a similar hydrograph form and response. Specifically, the Aquarius software package was used to copy and adjust the hydrograph from one station with no gap to another with a gap. After the data were copied, adjustments were made to scale the data appropriately.

Once a complete data record was available for all the stations using either estimated or measured flow, the continuous flow data from each station and the applicable precipitation data were post-processed using a custom program written in Visual Basic that delineates the start and stop time of individual storm events based on user selectable storm criteria (e.g., antecedent dry period, minimum rainfall, interevent dry period, etc.). The program then computes the following suite of summary statistics for each storm event:

- Precipitation start and stop time
- Precipitation duration
- Precipitation depth
- Precipitation average intensity
- Precipitation maximum intensity
- Precipitation antecedent dry period
- Flow start and stop time
- Flow duration
- Average flow rate
- Maximum flow rate
- Flow volume

Appendix D provides these summary statistics for the individual storm events that were delineated based on the continuous flow data from each station. Summary statistics computed across all the events for each station are provided in Table 4.

As described in the *Experimental Design* section of this document, data from the continuous flow monitoring are processed to calculate the following suite of thirteen indicators for evaluating hydrologic impacts from urban development:

- High pulse count
- High pulse duration
- High pulse range
- Flow reversal
- Richards-Baker flashiness index
- TQ Mean

Table 4. Summary Statistics for Storm Events by Monitoring Station.

| Station | Watershed Type | Median Average Flow Rate (cfs) | Maximum Flow Rate (cfs) | Median Flow Volume (cf) | Maximum Flow Volume (cf) |
|---------|----------------|--------------------------------|-------------------------|-------------------------|--------------------------|
| EVALSS | A | 2.64 | 20.31 | 209,322 | 1,245,547 |
| EVAMS | A | 0.96 | 5.75 | 76,573 | 463,986 |
| MONM | A | 2.20 | 32.04 | 184,808 | 1,732,231 |
| MONMN | A | 0.76 | 23.17 | 64,789 | 499,056 |
| MONMS | A | 0.27 | 3.92 | 22,510 | 195,453 |
| TOSMO | A | 1.00 | 18.03 | 84,484 | 726,708 |
| TOSMI | A | 0.71 | 13.64 | 60,927 | 457,572 |
| COLM | R | 2.48 | 15.62 | 211,401 | 1,683,982 |
| SEIMN | R | 0.76 | 6.41 | 63,254 | 536,005 |
| SEIMS | R | 0.75 | 6.83 | 61,484 | 496,447 |
| COUMO | C | 0.72 | 17.27 | 62,016 | 637,224 |
| COUMI | C | 0.24 | 6.24 | 20,426 | 295,846 |
| TYLMO | C | 0.86 | 14.94 | 75,470 | 671,214 |
| TYLMI | C | 0.35 | 4.51 | 31,117 | 276,099 |

cfs = cubic feet per second

cf = cubic feet

A = Application

R = Reference

C = Control

Values for the following three indicators were derived using a hydrograph separation algorithm that has been successfully used in several other studies (Herrera 2004, 2011) for this purpose:

- Storm flow volume
- Base flow volume
- Total flow volume

The computed values for these nine of these indicators are shown in Table 5.

Table 5. Computed Indicator Values for Evaluating Hydrologic Impacts.

| Station | Watershed Type | High Pulse Count (count) | High Pulse Duration (days) | High Pulse Range (days) | Low Pulse Count ^a (Count) | Low Pulse Duration ^a (days) | Low Pulse Range ^a (days) | Flow Reversal (count) | Richards-Baker Flashiness Index | TQ Mean (fraction of year) | Storm Flow Volume (cf) | Base Flow Volume (cf) | Total Flow Volume (cf) |
|---------|----------------|--------------------------|----------------------------|-------------------------|--------------------------------------|--|-------------------------------------|-----------------------|---------------------------------|----------------------------|------------------------|-----------------------|------------------------|
| VALSS | A | 12 | 1.6 | 160 | 5 | 2.4 | 63 | 118 | 0.37 | 0.16 | 9,731,246 | 53,345,938 | 63,077,184 |
| EVAMS | A | 16 | 1.6 | 160 | 5 | 4.0 | 182 | 153 | 0.33 | 0.20 | 4,216,936 | 18,202,931 | 22,419,867 |
| MONM | A | 12 | 4.8 | 175 | 8 | 23.0 | 214 | 130 | 0.32 | 0.35 | 16,581,882 | 21,968,220 | 38,550,102 |
| MONMN | A | 11 | 5.7 | 175 | 15 | 14.2 | 318 | 121 | 0.29 | 0.40 | 6,847,731 | 6,051,912 | 12,899,643 |
| MONMS | A | 18 | 2.5 | 221 | 9 | 16.7 | 195 | 111 | 0.34 | 0.37 | 1,850,786 | 3,066,526 | 4,917,312 |
| TOSMO | A | 19 | 1.6 | 177 | 24 | 6.5 | 265 | 135 | 0.28 | 0.43 | 7,204,861 | 11,923,853 | 19,128,714 |
| TOSMI | A | 20 | 1.8 | 178 | 20 | 8.7 | 230 | 147 | 0.27 | 0.52 | 5,991,422 | 6,410,554 | 12,401,976 |
| COLM | R | 8 | 8.9 | 142 | 9 | 22.6 | 281 | 71 | 0.27 | 0.31 | 21,901,400 | 17,139,856 | 39,041,256 |
| SEIMN | R | 15 | 3.1 | 142 | 6 | 28.8 | 203 | 103 | 0.39 | 0.21 | 4,539,591 | 12,126,736 | 16,666,327 |
| SEIMS | R | 13 | 2.3 | 144 | 3 | 4.7 | 40 | 124 | 0.33 | 0.20 | 3,589,092 | 14,102,802 | 17,691,894 |
| COUMO | C | 21 | 1.9 | 177 | 19 | 11.3 | 284 | 153 | 0.28 | 0.50 | 6,358,189 | 6,634,470 | 12,992,659 |
| COUMI | C | 17 | 2.6 | 158 | 9 | 15.2 | 204 | 115 | 0.30 | 0.36 | 1,926,353 | 2,785,388 | 4,711,741 |
| TYLMO | C | 24 | 2.3 | 238 | 24 | 9.3 | 333 | 149 | 0.30 | 0.57 | 8,317,445 | 5,099,350 | 13,416,795 |
| TYLMI | C | 24 | 2.4 | 330 | 24 | 9.5 | 334 | 121 | 0.26 | 0.60 | 3,821,093 | 1,779,904 | 5,600,997 |

^a Indicator calculated based on data collected over the calendar year (January 1, 2018, through December 31, 2018).

cf = cubic feet
A = Application
R = Reference
C = Control

WATER QUALITY MONITORING

Pursuant to the QAPP that was prepared for the study (Herrera 2015c), 12 grab samples are to be collected during storm events (three each quarter) at the 14 fixed monitoring stations that are identified in the *Experimental Design* section of this document for water quality monitoring. In addition, four grab samples are to be collected during base flow (one each quarter) at these same stations. The dates when samples were collected during storm events are identified in Table 6. Four and seven storm events were sampled in the first and second quarters of WY2018, respectively, to make up for events that were missed in WY2016 and WY2017 due to dry conditions. Only one storm event was sampled in the third quarter of WY2018 and no storm events were sampled in the fourth quarter due to extremely dry conditions. Additional storm events will be sampled in water year 2019 (WY2019) to make up for these missed events.

Note also that only the COLM station was sampled during the December 11, 2017, and March 20, 2018, base flow events to make up for events that were missed during the fourth quarter of WY2017 and first quarter of WY2018 because the channel was dry. At the end of WY2018, all 14 stations have samples from an equivalent number of base flow events.

The following criteria from the QAPP serve as guidelines for defining the acceptability of specific storm events for sampling:

- **Target precipitation depth:** A minimum of 0.25 inches of precipitation over a 24-hour period
- **Antecedent conditions:** A period of at least 6 hours preceding the event with less than 0.04 inches of precipitation

Table 6 compares these criteria to data collected in WY2018 during each sampled storm event from the precipitation monitoring stations described in the previous section (Tosh, Monticello, Evans, and Trilogy). As shown, these criteria were met for all storm events sampled over WY2018, except for the June 8, 2018, storm event where the Trilogy rain gauge recorded only 0.24 inches, just below the goal of 0.25 inches. This affected the following stations: COLM, SEIMN, SEIMS. To provide additional information for assessing the acceptability of sampled storm events, line plots showing the actual time samples were collected at each station relative to the storm event hydrograph are provided in Appendix E; storm event hydrographs in these plots are shaded grey to distinguish them from periods of base flow. These plots show that most samples were collected early on the rising limb or peak of the hydrograph with the following exceptions:

- During the storm event on November 12, 2017, samples were collected after rainfall was observed but before there was an appreciable rise in the hydrograph at EVAMS, EVALSS, COUMO, and COLM.
- During the storm event on November 19, 2017, samples were collected after rainfall was observed but before there was an appreciable rise in the hydrograph at EVAMS, EVALSS, and COLM.

- During the storm event on June 8, 2018, samples were collected after rainfall was observed but before there was an appreciable rise in the hydrograph at EVAMS, EVALSS, SEIMN, and SEIMS.

The representativeness of the data from these samples for assessing water quality during storm events will be more thoroughly assessed prior to their use in trend analyses for the study. If necessary, they may be reclassified as base flow samples for these analyses to avoid introducing bias in the associated results. In all cases, they will be used with extreme caution. In WY2019, care will be taken to sample stations in the Evans Creek watershed later in the storm event to ensure an appreciable rise in the hydrograph has occurred from inputs of stormwater.

As described in the QAPP for the RPWS (Herrera 2015c), base flow samples should be collected following a period of at least 48 hours without rain. Table 6 shows the dates when samples were collected during base flow with a comparison to this criterion using data from the precipitation monitoring stations described in the previous section. This comparison shows the criterion was met during all base flow sampling events.

Field data collection forms, chain-of-custody records, laboratory reports, and data quality audit forms from the storm event and base flow sampling during WY2018 are provided in Appendix F. The memorandum documenting results from the quality assurance review that was performed on these data is provided in Appendix G. Based on this review, 35 values were qualified as estimates as documented in Table 7, and no values were rejected. The majority of the qualified values were related to field duplicates that did not meet the criteria established in the QAPP (Herrera 2015a). Estimated values will be used with caution in subsequent trend analyses that will be performed for the study.

Appendix H presents tables with the following summary statistics for pollutant concentrations measured in storm event and base flow samples over WY2018:

- N (sample size)
- Minimum
- 25th Percentile
- Median
- 75th Percentile
- Maximum
- Quartile range
- Percent detected
- Percent exceeding the water quality standard for surface waters of the state of Washington (Ecology 2016), where applicable

Table 6. Sampling Dates and Comparison to Criteria for Storm Event and Base Flow Sampling.

| Water Year Quarter | Event Type | Event Date | Tosh Station ^a | | | Monticello Station ^b | | | Evans Station ^c | | | Trilogy Station ^d | | |
|--------------------|------------|-------------------------|-------------------------------|---|---|---------------------------------|---|---|-------------------------------|---|---|-------------------------------|---|---|
| | | | Precipitation Duration (hour) | Precipitation Depth ^e (inch) | Antecedent Dry Period ^f (hour) | Precipitation Duration (hour) | Precipitation Depth ^e (inch) | Antecedent Dry Period ^f (hour) | Precipitation Duration (hour) | Precipitation Depth ^e (inch) | Antecedent Dry Period ^f (hour) | Precipitation Duration (hour) | Precipitation Depth ^e (inch) | Antecedent Dry Period ^f (hour) |
| 1 | Base | 10/6/2017 ^g | NA | NA | 137.3 | NA | NA | 136.1 | NA | NA | 133.7 | NA | NA | 136.4 |
| 1 | Storm | 10/18/2017 | 41.3 | 1.63 | 22.1 | 36.6 | 1.55 | 22.8 | 41.3 | 1.65 | 22.3 | 50.3 | 1.89 | 22.7 |
| 1 | Storm | 11/12/2017 | 16.2 | 0.38 | 7.3 | 15.8 | 0.37 | 7.7 | 16.7 | 0.39 | 7.5 | 17.0 | 0.40 | 7.3 |
| 1 | Storm | 11/19/2017 | 25.5 | 1.01 | 75.3 | 24.8 | 0.87 | 76.4 | 24.2 | 0.93 | 77.0 | 25.2 | 0.98 | 76.1 |
| 1 | Base | 12/11/2017 ^h | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | 204.8 |
| 1 | Storm | 12/19/2017 | 30.8 | 1.96 | 31.5 | 32.0 | 1.96 | 30.8 | 31.1 | 1.92 | 31.6 | 31.7 | 2.02 | 25.7 |
| 2 | Storm | 1/11/2018 | 23.5 | 1.02 | 16.4 | 23.8 | 1.09 | 16.6 | 26.9 | 1.16 | 16.2 | 24.1 | 1.20 | 16.0 |
| 2 | Storm | 1/17/2018 | 14.8 | 1.22 | 33.5 | 14.3 | 1.19 | 33.2 | 14.6 | 1.13 | 33.2 | 14.8 | 1.18 | 32.8 |
| 2 | Storm | 1/23/2018 | 18.4 | 0.86 | 27.2 | 18.1 | 0.81 | 27.5 | 17.8 | 0.75 | 27.8 | 18.0 | 0.80 | 27.5 |
| 2 | Storm | 1/29/2018 | 9.8 | 0.82 | 30.8 | 9.7 | 0.78 | 30.5 | 9.0 | 0.78 | 31.0 | 9.0 | 0.70 | 32.1 |
| 2 | Storm | 2/1/2018 | 41.2 | 0.88 | 64.8 | 31.3 | 0.84 | 64.5 | 38.0 | 0.91 | 64.2 | 32.1 | 0.96 | 43.4 |
| 2 | Base | 2/12/2018 | NA | NA | 74.3 | NA | NA | 76.2 | NA | NA | 87.0 | NA | NA | 77.1 |
| 2 | Storm | 2/28/2018 | 12.6 | 0.40 | 16.2 | 13.3 | 0.36 | 15.8 | 12.1 | 0.35 | 17.2 | 13.9 | 0.45 | 15.7 |
| 2 | Storm | 3/8/2018 | 12.8 | 0.48 | 8.5 | 12.3 | 0.64 | 8.5 | 13.2 | 0.48 | 8.5 | 10.8 | 0.67 | 8.7 |
| 2 | Base | 3/20/2018 ^h | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | 151.8 |
| 3 | Base | 5/21/2018 | NA | NA | 310.1 | NA | NA | 267.6 | NA | NA | 268.6 | NA | NA | 259.6 |
| 3 | Storm | 6/8/2018 | 10.25 | 0.33 | 99.8 | 11.4 | 0.32 | 700.1 | 11.5 | 0.34 | 99.9 | 19.8 | 0.24 | 694.3 |
| 4 | Base | 8/8/2018 | NA | NA | 788.7 | NA | NA | 126.8 | NA | NA | 703.6 | NA | NA | 124.7 |

^a Station is used for measuring precipitation in the watersheds for Tosh Creek and Country Creek.

^b Station is used for measuring precipitation in the watersheds for Tyler Creek and Monticello Creek.

^c Station is used for measuring precipitation in the watershed for Evans Creek.

^d Station is used for measuring precipitation in the watersheds for Seidel Creek and Colin Creek.

^e Criteria for precipitation total is ≥ 0.25 inches in 12 hours for storm event sampling.

^f Criteria for antecedent dry period is ≥ 6 hours with < 0.04 inches of rain for storm event sampling and ≥ 48 hours with no rain for base flow sampling.

^g COLM not sampled for this base flow event due to a lack of flowing water at the station.

^h Only COLM was sampled for this base flow event so antecedent dry period is only reported for the corresponding Trilogy rain gauge.

NA = not applicable

Bold values indicate events which did not meet criteria for storm event or base flow sampling.

Table 7. Qualified Results from Discrete Water Quality Sampling.

| Event Date | Station | Water Quality Indicator | Reason for Qualification | Data Flag |
|------------|---------------|--|---------------------------------|-----------|
| 6/8/2018 | All locations | Fecal coliform bacteria | Holding time exceedance | J |
| 12/11/17 | COLM | Dissolved copper | Filter blank exceedance | J |
| 12/11/17 | COLM | Turbidity | Transfer blank exceedance | J |
| 12/11/17 | COLM | TKN | Transfer blank exceedance | J |
| 12/11/17 | COLM | Total copper | Transfer blank exceedance | J |
| 12/11/17 | COLM | Dissolved copper | Transfer blank exceedance | J |
| 3/20/18 | COLM | Nitrate + nitrite | Transfer blank exceedance | J |
| 10/06/17 | COUMI | Fecal coliform | Laboratory duplicate exceedance | J |
| 1/11/18 | COLM | Fecal coliform | Laboratory duplicate exceedance | J |
| 6/08/18 | EVALSS | TSS | Laboratory duplicate exceedance | J |
| 8/08/18 | COLM | Nitrate + nitrite | Laboratory duplicate exceedance | J |
| 10/06/17 | SEIMS | Nitrate + nitrite | Field duplicate exceedance | J |
| 10/18/17 | COUMI | Turbidity and TKN | Field duplicate exceedance | J |
| 11/12/17 | COUMO | Nitrate + nitrite | Field duplicate exceedance | J |
| 11/19/17 | TYLMO | TSS, turbidity, TKN, nitrate + nitrite, total copper, and total zinc | Field duplicate exceedance | J |
| 12/19/17 | EVAMS | Turbidity and TP | Field duplicate exceedance | J |
| 1/23/18 | SEIMN | Nitrate + nitrite | Field duplicate exceedance | J |
| 1/29/18 | MONMN | TSS and turbidity | Field duplicate exceedance | J |
| 2/01/18 | MONMS | Nitrate + nitrite and fecal coliform | Field duplicate exceedance | J |
| 2/12/18 | TYLMI | TSS and turbidity | Field duplicate exceedance | J |
| 2/28/18 | TOSMO | TP and TKN | Field duplicate exceedance | J |
| 5/21/18 | SEIMS | Fecal coliform | Field duplicate exceedance | J |
| 6/08/18 | COLM | TKN | Field duplicate exceedance | J |
| 8/08/18 | MONM | Nitrate + nitrite | Field duplicate exceedance | J |

J = Value qualified as an estimate based on quality assurance review.

DOC = dissolved organic carbon

TKN = Total Kjeldahl nitrogen

TSS = total suspended solids

In addition, Appendix I presents box and whisker plots that were developed from these same data that show the minimum and maximum values (lower and upper whiskers, respectively), 25th and 75th percentile values (lower and upper box edges, respectively), and median value (line in box). When nondetect values were present in the data, a value of one-half the detection limit was used in the computation of summary statistics.

In addition to the collection of grab samples during storm events and base flow, continuous monitoring of temperature was performed at all 14 of the fixed monitoring stations that are identified in the *Experimental Design* section of this document for water quality monitoring. Continuous monitoring of conductivity was also performed at the following subset of stations:

EVALSS, EVAMS, MONM, MONMS, TOSMO, SEIMN, SEIMS, COUMO, and TYLMO. Line plots showing the continuous temperature and conductivity data collected at each of these stations are provided in Appendices J and K, respectively. The line plots for the continuous temperature data also show the 7-day average of the daily maximum temperatures (7-DADMAX) relative to the applicable aquatic life temperature criterion for surface waters of the state of Washington (Ecology 2016).

Based on reviews of the continuous temperature and conductivity data presented in Appendices J and K, the following quality assurance issues were identified in connection with these data:

- No continuous conductivity data are available for the COUMO station over the period from May 8, 2018, through May 10, 2018.
- No continuous conductivity data are available for the MONMS station over the period from January 30, 2018, through April 12, 2018.
- No continuous conductivity data are available for the SEIMN station over the period from April 12, 2018, through May 4, 2018.
- No continuous conductivity data are available for the TYLMO station over the period from September 13, 2018, through September 30, 2018.

PHYSICAL HABITAT MONITORING

Physical habitat monitoring for WY2018 was completed at the 19 fixed monitoring stations that are identified in the *Experimental Design* section of this document on the following dates:

- EVALSS 9/10/2018
- EVAMS 9/10/2018
- MONT-1 9/6/2018
- MONT-2 9/6/2018
- MONT-3 7/26/2018
- MONT- 4 7/25/2018
- MONT-5 7/6/2018
- TOSH-1 8/3/2018
- TOSH-2 9/11/2018

- TOSH-3 7/20/2018
- TOSH-4 9/11/2018
- COLIN-1 7/5/2018
- SIDL-1 9/12/2018
- SIDL-2 8/23/2018
- SIDL-3 7/16/2018
- CTRY-1 8/22/2018
- CTRY-2 8/9/2018
- TYLR-1 7/13/2018
- TYLR-2 8/2/2018

Compiled field data from this monitoring are presented in Appendix L and the computed indicators for evaluating physical habitat quality are presented in Appendix M. Finally, Appendix N provides tables with summary statistics for the indicators that are organized in the following categories:

- Bed stability (Table N-1)
- Channel dimensions (Table N-2)
- Fish cover (Table N-3)
- Habitat dimensions (Table N-4)
- Habitat unit extents (Table N-5)
- Large woody debris (Table N-6)
- Riparian cover (Table N-7)
- Riparian Disturbance (Table N-8)
- Riparian vegetation structure (Table N-9)
- Sinuosity (Table N-10)
- Substrate (Table N-11)

SEDIMENT QUALITY MONITORING

Sediment quality monitoring for WY2018 was completed at the 19 fixed monitoring stations that are identified in the *Experimental Design* section of this document on the following dates:

- EVALSS 9/10/2018
- EVAMS 9/10/2018
- MONT-1 9/6/2018
- MONT-2 9/6/2018
- MONT-3 7/26/2018
- MONT-4 7/25/2018
- MONT-5 7/6/2018
- TOSH-1 8/3/2018
- TOSH-2 9/11/2018
- TOSH-3 7/20/2018
- TOSH-4 9/11/2018
- COLIN-1 7/5/2018
- SIDL-1 9/12/2018
- SIDL-2 8/23/2018
- SIDL-3 7/16/2018
- CTRY-1 8/22/2018
- CTRY-2 8/9/2018
- TYLR-1 7/13/2018
- TYLR-2 8/2/2018

Field data laboratory reports and data quality audit forms from sediment quality sampling in WY2018 are provided in Appendix O. The memorandum documenting results from the quality assurance review that was performed on these data is provided in Appendix P. The values for

polycyclic aromatic hydrocarbons (PAHs) and phthalates from the sample collected from the CTRY-2 station on November 9, 2018, were qualified as estimates based on this review because holding time for extraction (14 days) was exceeded. No other values were qualified as estimates or rejected.

Total organic carbon, zinc, and copper concentrations measured in sediment samples are presented in Table 8. Concentrations of PAHs and phthalates are presented in Tables 9 and 10, respectively.

| Table 8. Concentrations of Total Organic Carbon, Copper, and Zinc Measured in Sediment Samples.^a | | | | |
|--|-----------------------|---------------------------------------|-----------------------|---------------------|
| Station | Watershed Type | Total Organic Carbon (percent) | Copper (mg/Kg) | Zinc (mg/Kg) |
| EVALSS | A | 12 | 38 | 100 |
| EVAMS | A | 4.8 | 22 | 91 |
| MONT-1 | A | 3.7 | 32 | 260 |
| MONT-2 | A | 1.4 | 40 | 560 |
| MONT-3 | A | 4.9 | 65 | 1200 |
| MONT-4 | A | 12 | 56 | 410 |
| MONT-5 | A | 1.9 | 39 | 250 |
| TOSH-1 | A | 2.4 | 32 | 290 |
| TOSH-2 | A | 3.6 | 33 | 340 |
| TOSH-3 | A | 2.9 | 41 | 500 |
| TOSH-4 | A | 3.4 | 54 | 920 |
| COLIN-1 | R | 1.3 | 21 | 94 |
| SIDL-1 | R | 2.1 | 32 | 98 |
| SIDL-2 | R | 2.3 | 40 | 80 |
| SIDL-3 | R | 2.2 | 20 | 78 |
| CTRY-1 | C | 9 | 45 | 440 |
| CTRY-2 | C | 3.7 | 27 | 90 |
| TYLR-1 | C | 1.1 | 57 | 370 |
| TYLR-2 | C | 4 | 110 | 780 |

^a Samples were processed (sieved) in the field to make two unique samples. The first sample was sieved to less than 2.0 mm and analyzed for multiple organic compounds (PAHs and phthalates) and total-organic carbon. The second sample was sieved to less than 63 µm and analyzed for metals (copper and zinc).

mg/Kg = milligram/kilogram

A = Application

R = Reference

C = Control

Table 9. Concentrations of Polycyclic Aromatic Hydrocarbons Measured in Sediment Samples.^a

| Station | Watershed Type | 1-Methyl-naphthalene (mg/Kg) | 2-Methyl-naphthalene (mg/Kg) | Ace-naphthene (mg/Kg) | Ace-naphthylene (mg/Kg) | Anthracene (mg/Kg) | Benz[a]-anthracene (mg/Kg) | Benzo(a)-pyrene (mg/Kg) | Benzo(b)-fluoranthene (mg/Kg) | Benzo(ghi)-perylene (mg/Kg) | Benzo(j,k)-fluoranthene (mg/Kg) | Chrysene (mg/Kg) | Dibenzo(a,h)-anthracene (mg/Kg) | Fluoranthene (mg/Kg) | Fluorene (mg/Kg) | Indeno-(1,2,3cd)-pyrene (mg/Kg) | Naphthalene (mg/Kg) | Phenanthrene (mg/Kg) | Pyrene (mg/Kg) | Total PAHs (mg/Kg) | |
|---------|----------------|------------------------------|------------------------------|-----------------------|-------------------------|--------------------|----------------------------|-------------------------|-------------------------------|-----------------------------|---------------------------------|------------------|---------------------------------|----------------------|------------------|---------------------------------|---------------------|----------------------|----------------|--------------------|----------|
| VALSS | A | 0.0150 U | 0.0150 U | 0.0150 U | 0.0150 U | 0.0150 U | 0.0150 U | 0.0150 U | 0.0150 U | 0.0150 U | 0.0150 U | 0.0150 U | 0.0150 U | 0.0180 | 0.0150 U | 0.0150 U | 0.0150 U | 0.0150 U | 0.0180 | 0.3600 | |
| EVAMS | A | 0.0085 U | 0.0085 U | 0.0085 U | 0.0085 U | 0.0085 U | 0.0380 | 0.0420 | 0.0530 | 0.0200 | 0.0190 | 0.0430 | 0.0085 U | 0.0320 | 0.0085 U | 0.0260 | 0.0085 U | 0.0085 U | 0.0480 | 0.3210 | |
| MONT-1 | A | 0.0073 U | 0.0073 U | 0.0073 U | 0.0073 U | 0.0073 U | 0.0073 U | 0.0073 U | 0.0073 U | 0.0073 U | 0.0073 U | 0.0073 U | 0.0073 U | 0.0073 U | 0.0073 U | 0.0073 U | 0.0073 U | 0.0073 U | 0.0073 U | 0.0073 J | 0.0073 J |
| MONT-2 | A | 0.0057 U | 0.0057 U | 0.0057 U | 0.0057 U | 0.0057 U | 0.0057 U | 0.0057 U | 0.0057 U | 0.0057 U | 0.0057 U | 0.0057 U | 0.0057 U | 0.0057 U | 0.0057 U | 0.0057 U | 0.0057 U | 0.0057 U | 0.0057 U | 0.0057 J | 0.0057 J |
| MONT-3 | A | 0.0250 U | 0.0250 U | 0.0250 U | 0.0250 U | 0.0250 U | 0.0250 U | 0.0260 | 0.0260 | 0.0270 | 0.0250 U | 0.0250 U | 0.0250 U | 0.0250 U | 0.0250 U | 0.0250 U | 0.0250 U | 0.0250 U | 0.0250 U | 0.0250 J | 0.079 |
| MONT-4 | A | 0.0210 U | 0.0210 U | 0.0210 U | 0.0210 U | 0.0210 U | 0.0210 U | 0.0210 U | 0.0210 U | 0.0210 U | 0.0210 U | 0.0210 U | 0.0210 U | 0.0210 U | 0.0210 U | 0.0210 U | 0.0210 U | 0.0210 U | 0.0210 U | 0.0210 J | 0.0210 J |
| MONT-5 | A | 0.0077 U | 0.0077 U | 0.0077 U | 0.0077 U | 0.0077 U | 0.0077 U | 0.0077 U | 0.0077 U | 0.0077 U | 0.0077 U | 0.0077 U | 0.0077 U | 0.0077 U | 0.0077 U | 0.0077 U | 0.0077 U | 0.0077 U | 0.0077 U | 0.0077 J | 0.0077 J |
| TOSH-1 | A | 0.0170 U | 0.0170 U | 0.0170 U | 0.0170 U | 0.0170 U | 0.0430 | 0.0480 | 0.0650 | 0.0340 | 0.0210 | 0.0490 | 0.0170 U | 0.1100 | 0.0170 U | 0.0360 | 0.0170 U | 0.0570 | 0.0850 | 0.5480 | |
| TOSH-2 | A | 0.0084 U | 0.0084 U | 0.0084 U | 0.0084 U | 0.0084 U | 0.0370 | 0.0400 | 0.0600 | 0.0310 | 0.0180 | 0.0450 | 0.0084 U | 0.0680 | 0.0084 U | 0.0330 | 0.0084 U | 0.0460 | 0.0710 | 0.4490 | |
| TOSH-3 | A | 0.0150 U | 0.0150 U | 0.0150 U | 0.0150 U | 0.0150 U | 0.0530 | 0.0720 | 0.0970 | 0.0610 | 0.0270 | 0.0760 | 0.0150 U | 0.1400 | 0.0150 U | 0.0580 | 0.0150 U | 0.0640 | 0.1100 | 0.7580 | |
| TOSH-4 | A | 0.0076 U | 0.0076 U | 0.0076 U | 0.0076 U | 0.0076 U | 0.0076 U | 0.0076 U | 0.0087 | 0.0110 | 0.0076 U | 0.0087 | 0.0076 U | 0.0091 | 0.0076 U | 0.0076 U | 0.0076 U | 0.0076 U | 0.0100 | 0.0475 | |
| COLIN-1 | R | 0.0065 U | 0.0065 U | 0.0065 U | 0.0065 U | 0.0065 U | 0.0065 | 0.0065 | 0.0065 U | 0.0065 U | 0.0065 U | 0.0065 U | 0.0065 U | 0.0065 U | 0.0065 U | 0.0065 U | 0.0065 U | 0.0065 U | 0.0065 U | 0.0065 U | |
| SIDL-1 | R | 0.0082 U | 0.0082 U | 0.0082 U | 0.0082 U | 0.0082 U | 0.0140 | 0.0160 | 0.0150 | 0.0082 U | 0.0082 U | 0.0160 | 0.0082 U | 0.0170 | 0.0082 U | 0.0091 | 0.0082 U | 0.0090 | 0.0240 | 0.1201 | |
| SIDL-2 | R | 0.0130 U | 0.0130 U | 0.0130 U | 0.0130 U | 0.0130 U | 0.0130 U | 0.0130 U | 0.0130 U | 0.0130 U | 0.0130 U | 0.0130 U | 0.0130 U | 0.0130 U | 0.0130 U | 0.0130 U | 0.0130 U | 0.0130 U | 0.0130 U | 0.0130 J | 0.0130 J |
| SIDL-3 | R | 0.0110 U | 0.0110 U | 0.0110 U | 0.0110 U | 0.0110 U | 0.0140 | 0.0180 | 0.0140 | 0.0110 U | 0.0110 U | 0.0140 | 0.0110 U | 0.0230 | 0.0110 U | 0.0110 U | 0.0110 U | 0.0260 | 0.0360 | 0.1450 | |
| CTRY-1 | C | 0.0140 U | 0.0140 U | 0.0140 U | 0.0140 U | 0.0530 | 0.2500 | 0.2500 | 0.3800 | 0.2000 | 0.0980 | 0.2900 | 0.0310 | 0.6400 | 0.0220 | 0.2000 | 0.0140 U | 0.3000 | 0.5900 | 3.3040 | |
| CTRY-2 | C | 0.0200 J | 0.0130 J | 0.0340 J | 0.0320 J | 0.1200 J | 0.1700 J | 0.1500 J | 0.1300 J | 0.0720 J | 0.0470 J | 0.1700 J | 0.0110 J | 0.3300 J | 0.0730 J | 0.0690 J | 0.0150 J | 0.5600 J | 0.4700 J | 2.486 J | |
| TYLR-1 | C | 0.0067 U | 0.0067 U | 0.0067 U | 0.0067 U | 0.0067 U | 0.0070 | 0.0120 | 0.0140 | 0.0096 | 0.0067 U | 0.0098 | 0.0067 U | 0.0170 | 0.0067 U | 0.0084 | 0.0067 U | 0.0079 | 0.0150 | 0.1007 | |
| TYLR-2 | C | 0.0110 U | 0.0110 U | 0.0110 U | 0.0110 U | 0.0110 U | 0.0160 | 0.0240 | 0.0250 | 0.0150 | 0.0110 U | 0.0170 | 0.0110 U | 0.0360 | 0.0110 U | 0.0140 | 0.0110 U | 0.0230 | 0.0270 | 0.1970 | |

^a Samples were processed (sieved) in the field to make two unique samples. The first sample was sieved to less than 2.0 mm and analyzed for multiple organic compounds (PAHs and phthalates) and total-organic carbon. The second sample was sieved to less than 63 µm and analyzed for metals (copper and zinc).

mg/Kg = milligram/kilogram

A = Application

R = Reference

C = Control

U = Undetected at the detection limit noted

J = estimated value

Table 10. Concentrations of Phthalates Measured in Sediment Samples.^a

| Station | Watershed Type | bis(2-Ethylhexyl)-phthalate (mg/Kg) | Butylbenzyl-phthalate (mg/Kg) | Diethyl-phthalate (mg/Kg) | Dimethyl-phthalate (mg/Kg) | Di-n-butylphthalate (mg/Kg) | Di-n-octylphthalate (mg/Kg) |
|---------|----------------|-------------------------------------|-------------------------------|---------------------------|----------------------------|-----------------------------|-----------------------------|
| EVALSS | A | 2.1 | 0.38 U | 0.38 U | 0.075 U | 0.49 | 0.38 U |
| EVAMS | A | 0.64 | 0.21 U | 0.21 U | 0.043 U | 0.28 | 0.21 U |
| MONT-1 | A | 0.18 U | 0.18 U | 0.18 U | 0.036 U | 0.36 | 0.18 U |
| MONT-2 | A | 0.14 U | 0.14 U | 0.14 U | 0.028 U | 0.17 | 0.14 U |
| MONT-3 | A | 3.1 U | 3.1 U | 3.1 U | 0.62 U | 3.1 U | 3.1 U |
| MONT-4 | A | 0.57 | 0.53 U | 0.53 U | 0.11 U | 0.53 U | 0.53 U |
| MONT-5 | A | 0.19 U | 0.19 U | 0.19 U | 0.038 U | 0.19 U | 0.19 U |
| TOSH-1 | A | 2.1 U | 2.1 U | 2.1 U | 0.42 U | 2.1 U | 2.1 U |
| TOSH-2 | A | 0.95 | 0.21 U | 0.21 U | 0.042 U | 0.38 | 0.21 U |
| TOSH-3 | A | 1.9 U | 1.9 U | 1.9 U | 0.37 U | 1.9 U | 1.9 U |
| TOSH-4 | A | 1.7 | 0.19 U | 0.19 U | 0.038 U | 0.32 | 0.19 U |
| COLIN-1 | R | 0.16 U | 0.16 U | 0.16 U | 0.032 U | 0.16 U | 0.16 U |
| SIDL-1 | R | 0.21 U | 0.21 U | 0.21 U | 0.041 U | 0.31 | 0.21 U |
| SIDL-2 | R | 0.32 U | 0.32 U | 0.32 U | 0.064 U | 1.3 | 0.32 U |
| SIDL-3 | R | 0.27 U | 0.27 U | 0.27 U | 0.054 U | 0.27 U | 0.27 U |
| CTRY-1 | C | 1.8 U | 1.8 U | 1.8 U | 0.35 U | 1.8 U | 1.8 U |
| CTRY-2 | C | 0.21 UJ | 0.21 UJ | 0.21 UJ | 0.043 UJ | 1 J | 0.21 UJ |
| TYLR-1 | C | 0.17 U | 0.17 U | 0.17 U | 0.033 U | 0.17 U | 0.17 U |
| TYLR-2 | C | 0.28 U | 0.28 U | 0.28 U | 0.057 U | 0.49 | 0.28 U |

^a Samples were processed (sieved) in the field to make two unique samples. The first sample was sieved to less than 2.0 mm and analyzed for multiple organic compounds (PAHs and phthalates) and total-organic carbon. The second sample was sieved to less than 63 µm and analyzed for metals (copper and zinc).

mg/Kg = milligram/kilogram

A = Application

R = Reference

C = Control

U = Undetected at the detection limit noted

J = estimated value

ND = no data

BIOLOGICAL MONITORING

Biological monitoring for WY2018 was completed at the 19 fixed monitoring stations that are identified in the *Experimental Design* section of this document on the following dates:

- EVALSS 9/10/2018
- EVAMS 9/10/2018
- MONT-1 9/6/2018
- MONT-2 9/6/2018
- MONT-3 7/26/2018
- MONT-4 7/25/2018
- MONT-5 7/6/2018
- TOSH-1 8/3/2018
- TOSH-2 9/11/2018
- TOSH-3 7/20/2018
- TOSH-4 9/11/2018
- COLIN-1 7/5/2018
- SIDL-1 9/12/2018
- SIDL-2 8/23/2018
- SIDL-3 9/12/2018
- CTRY-1 8/22/2018
- CTRY-2 8/9/2018
- TYLR-1 7/13/2018
- TYLR-2 8/2/2018

The laboratory report for biological monitoring in WY2018 is provided in Appendix Q. Quality assurance review documentation for these data is provided in Appendix R. Results from this review indicated there were no significant quality assurance issues that would limit the use of the data. The indicators computed from these data for use in evaluating stream health are summarized in Table 11.

Table 11. Computed Biological Indicators for Evaluating Stream Health.

| Station | Watershed Type | Overall Condition | Benthic Index of Biotic Integrity | Total Taxa Richness | Ephemeroptera Richness | Plecoptera Richness | Trichoptera Richness | Clinger Taxa Richness | Long-Lived Taxa Richness | Intolerant Taxa Richness | Percent Dominant (top 3) | Percent Predator Individuals | Percent Tolerant Individuals |
|---------|----------------|-------------------|-----------------------------------|---------------------|------------------------|---------------------|----------------------|-----------------------|--------------------------|--------------------------|--------------------------|------------------------------|------------------------------|
| EVALSS | A | Poor | 36.1 | 31 | 4 | 5 | 8 | 17 | 16 | 7 | 77.8% | 4.2% | 67.6% |
| EVAMS | A | Poor | 38.9 | 25 | 2 | 6 | 3 | 11 | 12 | 10 | 66.8% | 23.9% | 43.7% |
| MONT-1 | A | Fair | 53.5 | 39 | 2 | 5 | 5 | 12 | 17 | 7 | 44.4% | 47.5% | 6.7% |
| MONT-2 | A | Good | 74.0 | 53 | 6 | 6 | 7 | 19 | 23 | 8 | 40.0% | 15.0% | 5.8% |
| MONT-3 | A | Poor | 30.3 | 42 | 2 | 2 | 3 | 7 | 14 | 5 | 57.2% | 8.6% | 22.0% |
| MONT-4 | A | Poor | 36.5 | 43 | 3 | 2 | 3 | 8 | 11 | 5 | 35.3% | 13.1% | 30.4% |
| MONT-5 | A | Fair | 52.9 | 32 | 3 | 4 | 7 | 14 | 12 | 7 | 33.7% | 34.9% | 9.5% |
| TOSH-1 | A | Poor | 30.8 | 29 | 2 | 4 | 0 | 6 | 8 | 4 | 34.3% | 12.4% | 16.3% |
| TOSH-2 | A | Poor | 34.1 | 23 | 2 | 4 | 4 | 10 | 9 | 6 | 40.7% | 14.3% | 25.3% |
| TOSH-3 | A | Poor | 39.8 | 43 | 2 | 4 | 8 | 14 | 14 | 5 | 48.6% | 10.2% | 35.0% |
| TOSH-4 | A | Very Poor | 10.0 | 21 | 0 | 2 | 3 | 5 | 6 | 5 | 77.4% | 5.7% | 69.3% |
| COLIN-1 | R | Poor | 38.5 | 30 | 4 | 4 | 2 | 10 | 9 | 5 | 62.1% | 28.0% | 2.6% |
| SIDL-1 | R | Good | 60.4 | 47 | 5 | 5 | 4 | 14 | 17 | 10 | 43.7% | 7.3% | 7.8% |
| SIDL-2 | R | Fair | 47.0 | 28 | 5 | 5 | 5 | 15 | 13 | 7 | 54.2% | 29.5% | 33.9% |
| SIDL-3 | R | Fair | 42.2 | 27 | 3 | 2 | 6 | 11 | 12 | 5 | 40.4% | 38.4% | 24.2% |
| CTRY-1 | C | Very Poor | 13.2 | 30 | 1 | 3 | 0 | 4 | 7 | 5 | 64.4% | 0.4% | 24.6% |
| CTRY-2 | C | Fair | 46.6 | 46 | 4 | 6 | 5 | 15 | 9 | 5 | 39.2% | 12.4% | 21.6% |
| TYL-1 | C | Fair | 40.6 | 39 | 2 | 4 | 7 | 13 | 12 | 5 | 40.0% | 10.8% | 26.4% |
| TYL-2 | C | Very Poor | 10.5 | 24 | 1 | 2 | 0 | 3 | 3 | 2 | 58.4% | 0.6% | 16.2% |

A = Application

R = Reference

C = Control

ND = no data

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APPENDIX A

Line Plots Showing Continuous Flow Data by Watershed

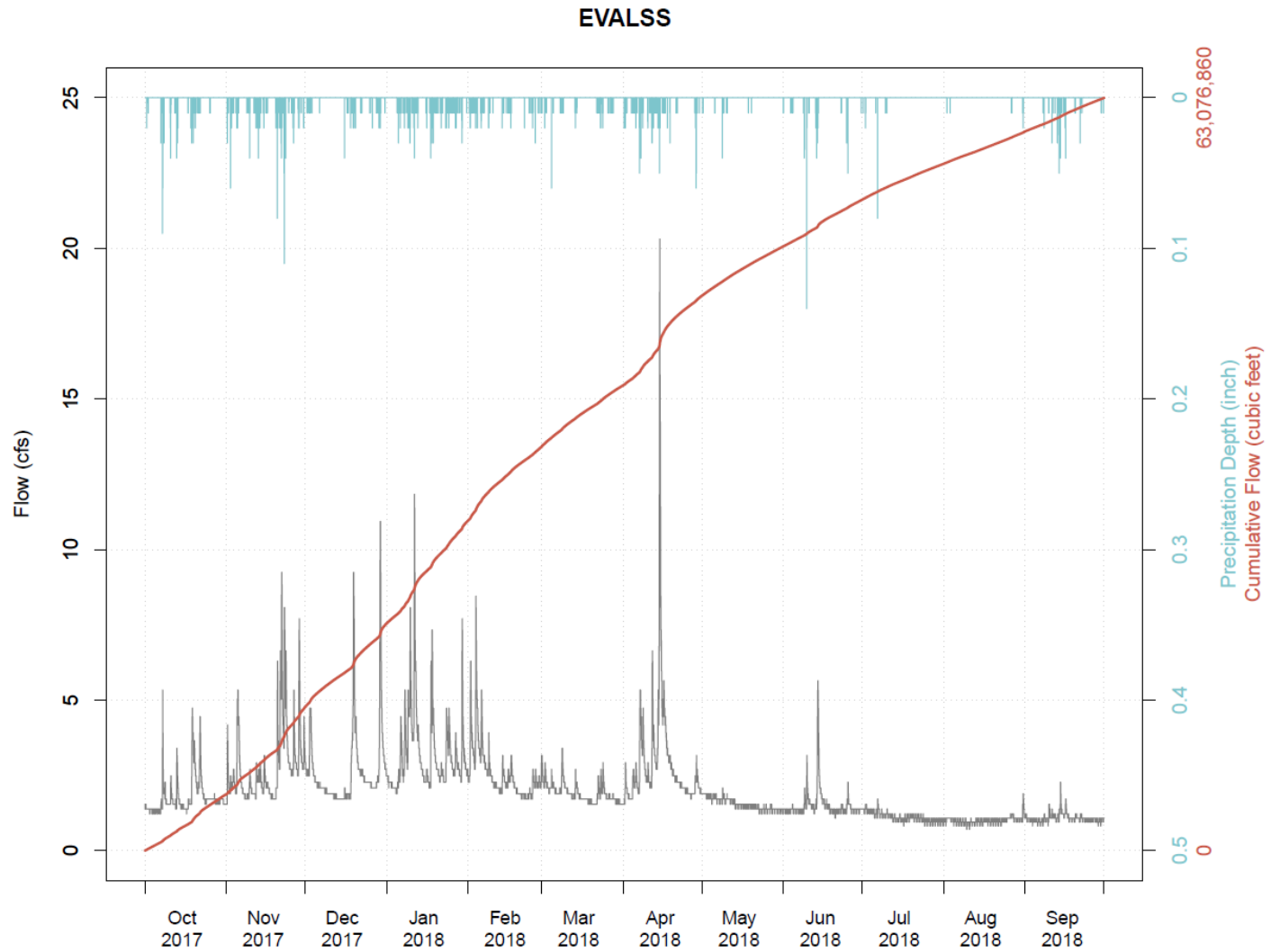


Figure A-1. Continuous Flow, Cumulative Flow, and Precipitation Depth Measured at the EVALSS Station.

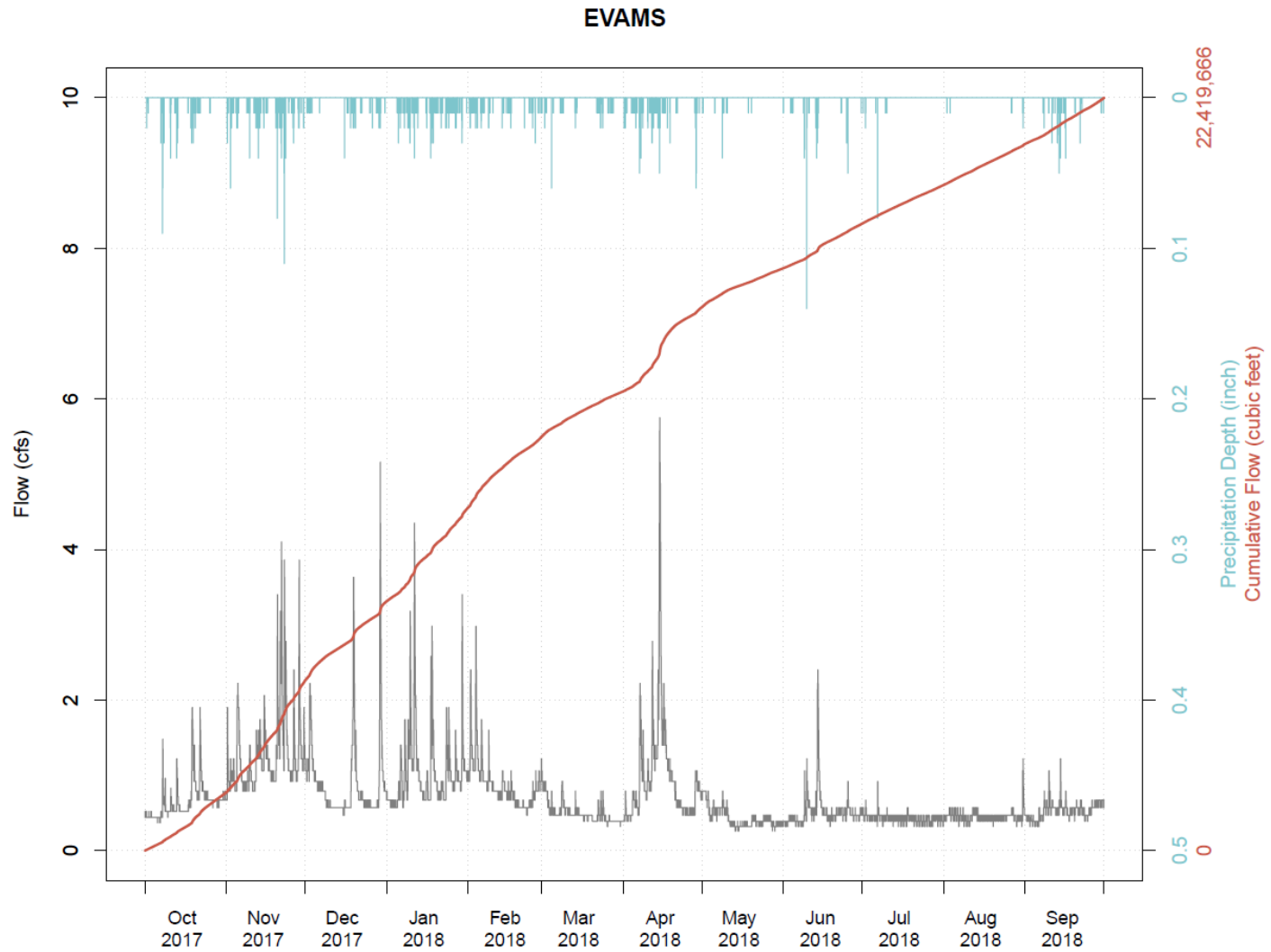


Figure A-2. Continuous Flow, Cumulative Flow, and Precipitation Depth Measured at the EVAMS Station.

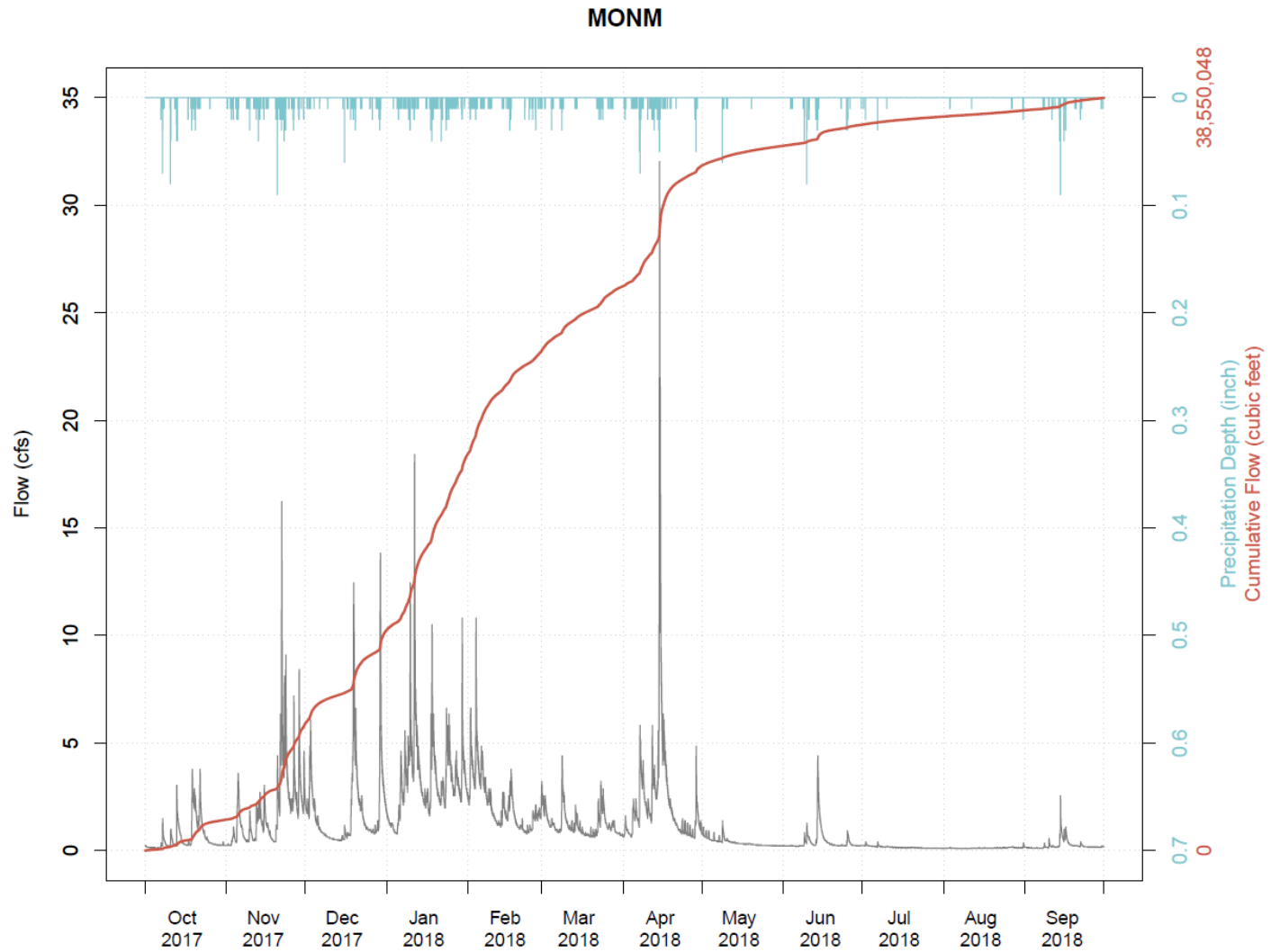


Figure A-3. Continuous Flow, Cumulative Flow, and Precipitation Depth Measured at the MONM Station.

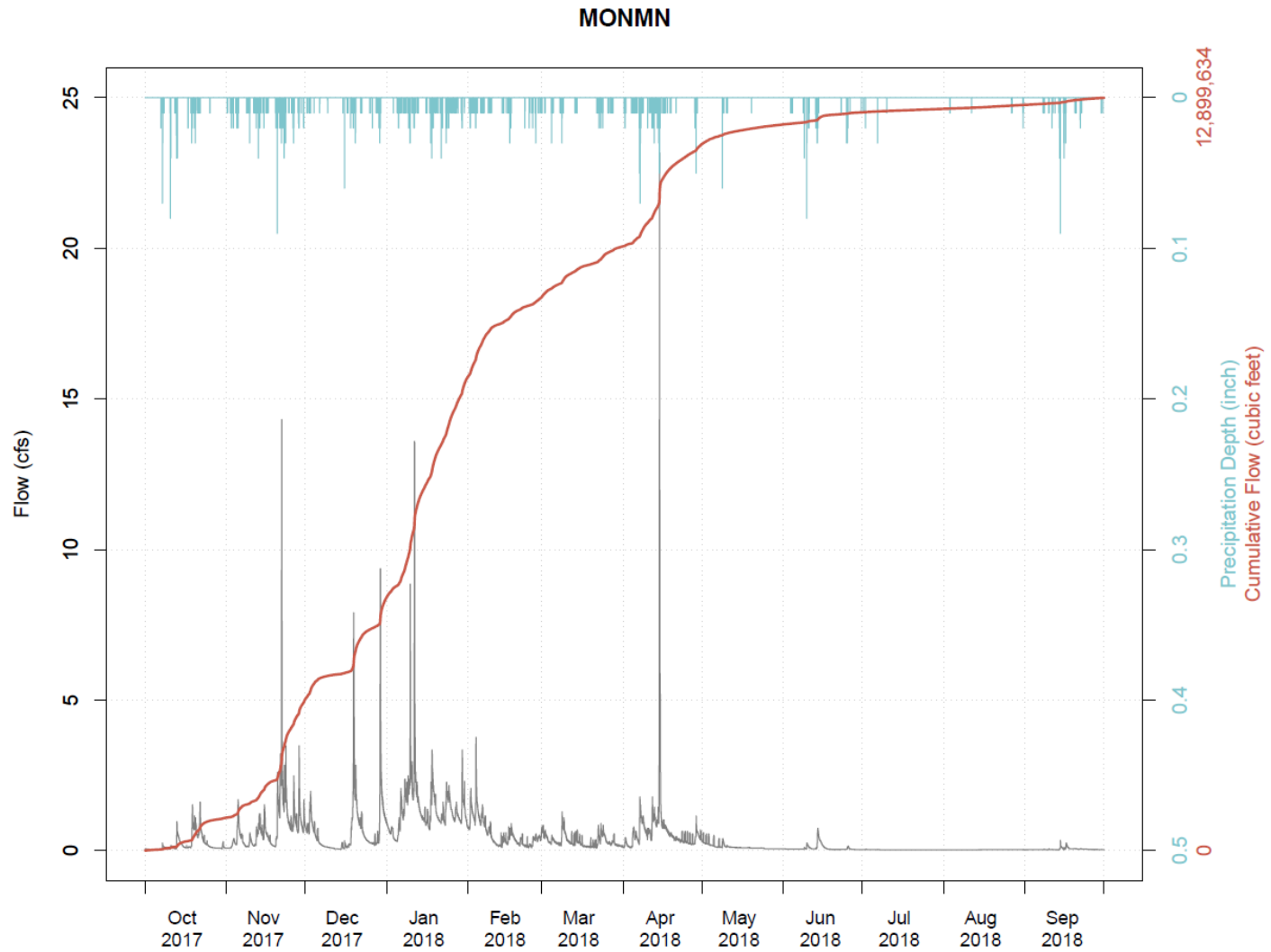


Figure A-4. Continuous Flow, Cumulative Flow, and Precipitation Depth Measured at the MONMN Station.

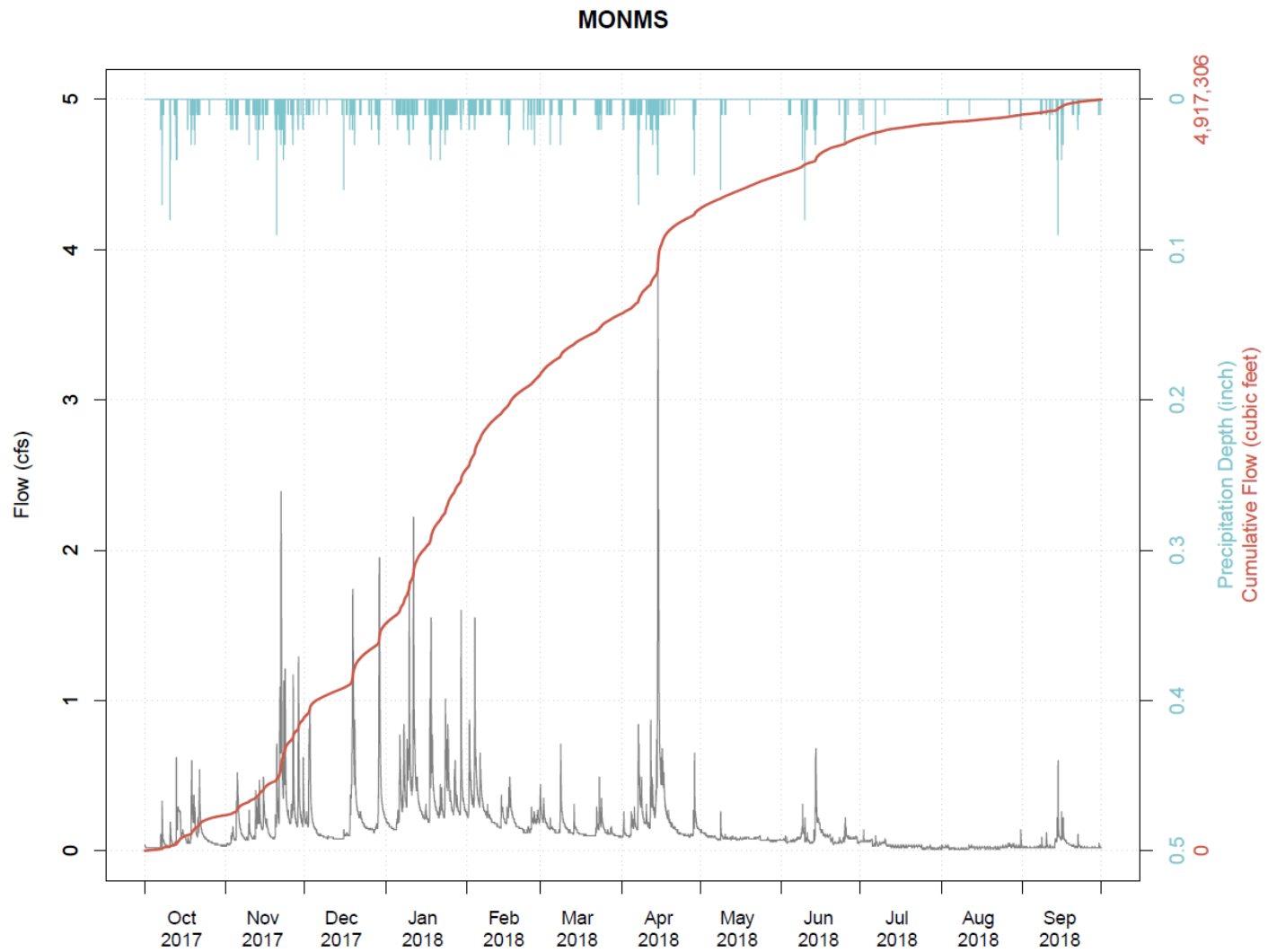


Figure A-5. Continuous Flow, Cumulative Flow, and Precipitation Depth Measured at the MONMS Station.

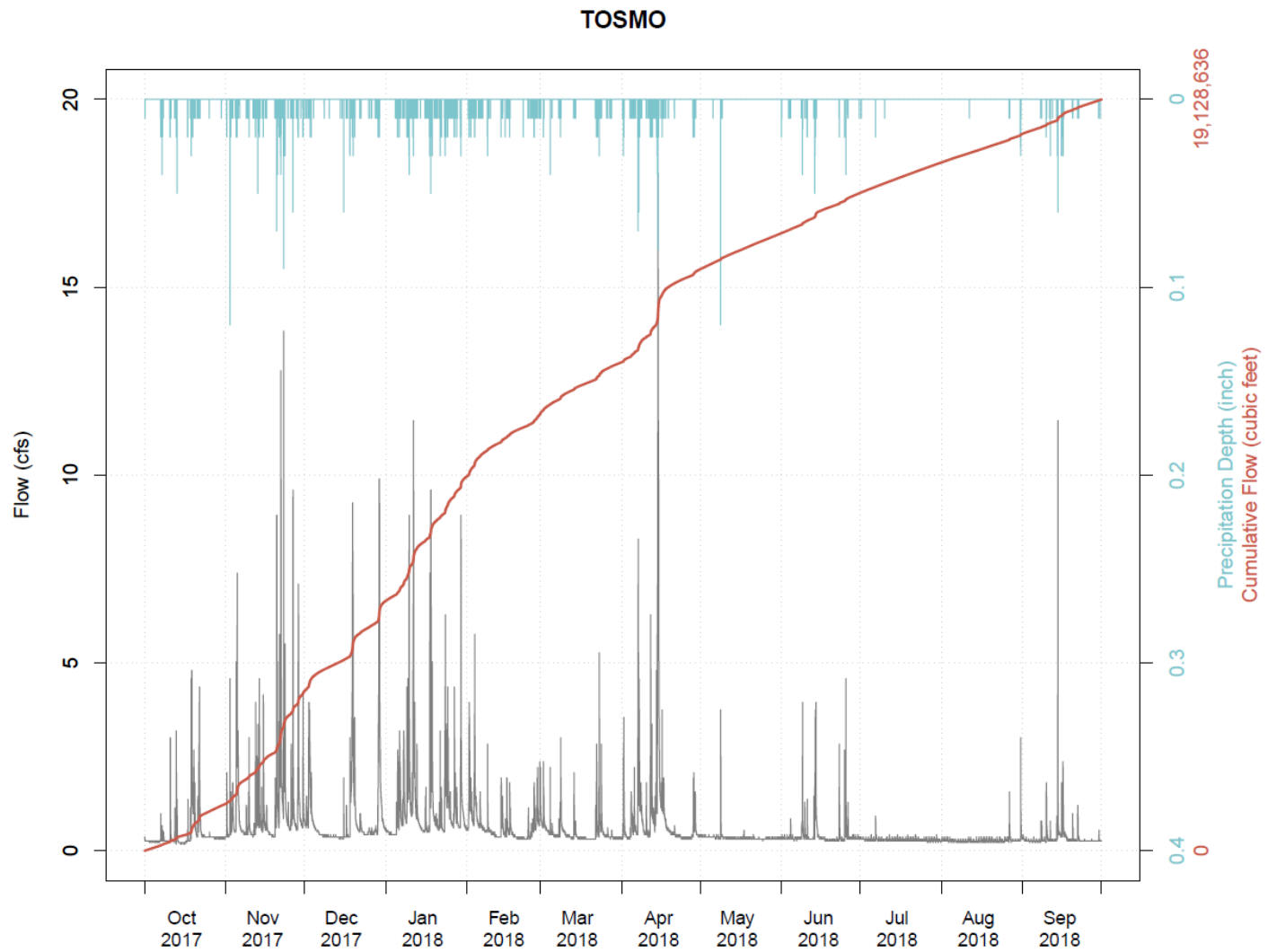


Figure A-6. Continuous Flow, Cumulative Flow, and Precipitation Depth Measured at the TOSMO Station.

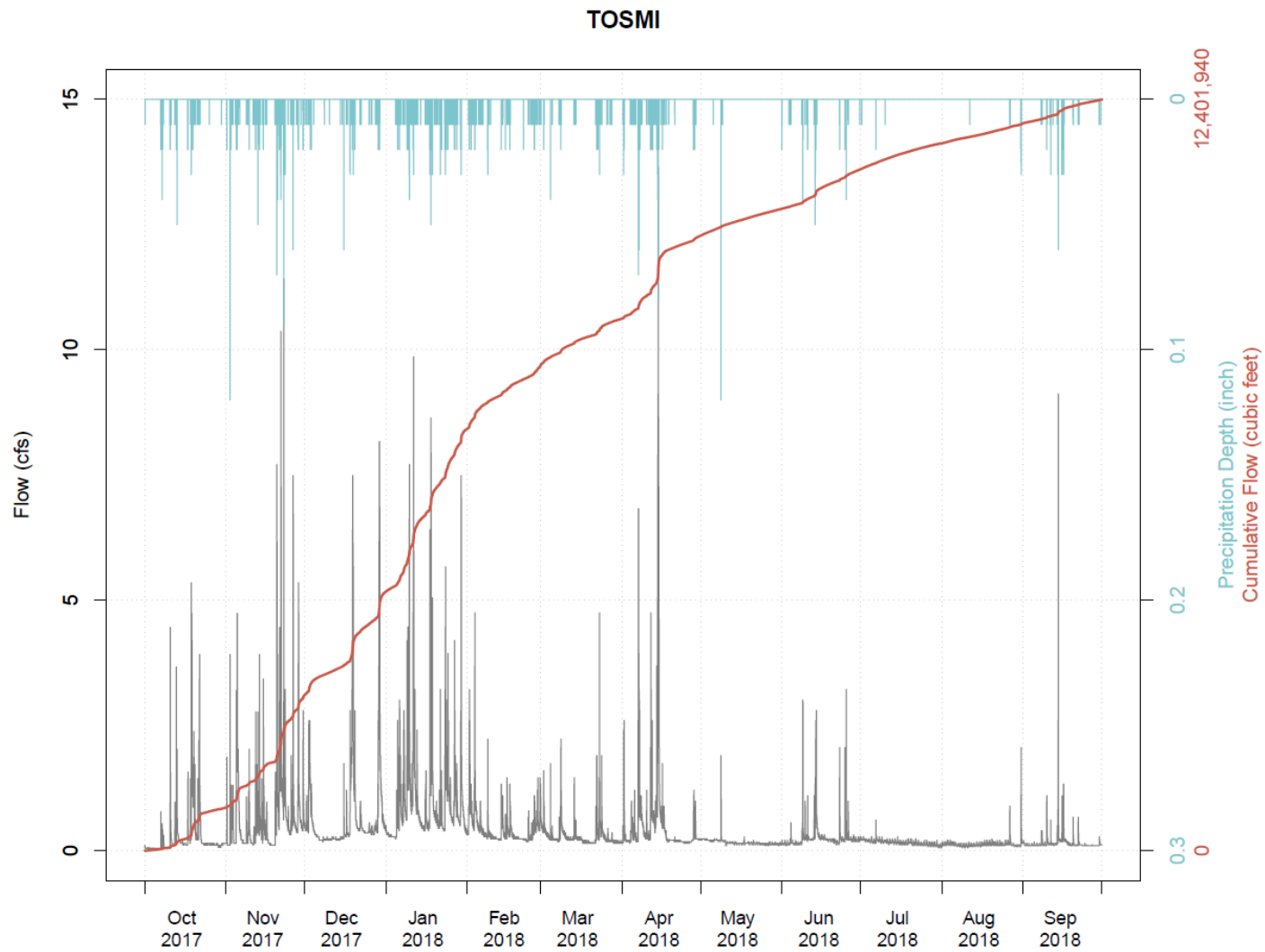


Figure A-7. Continuous Flow, Cumulative Flow, and Precipitation Depth Measured at the TOSMI Station.

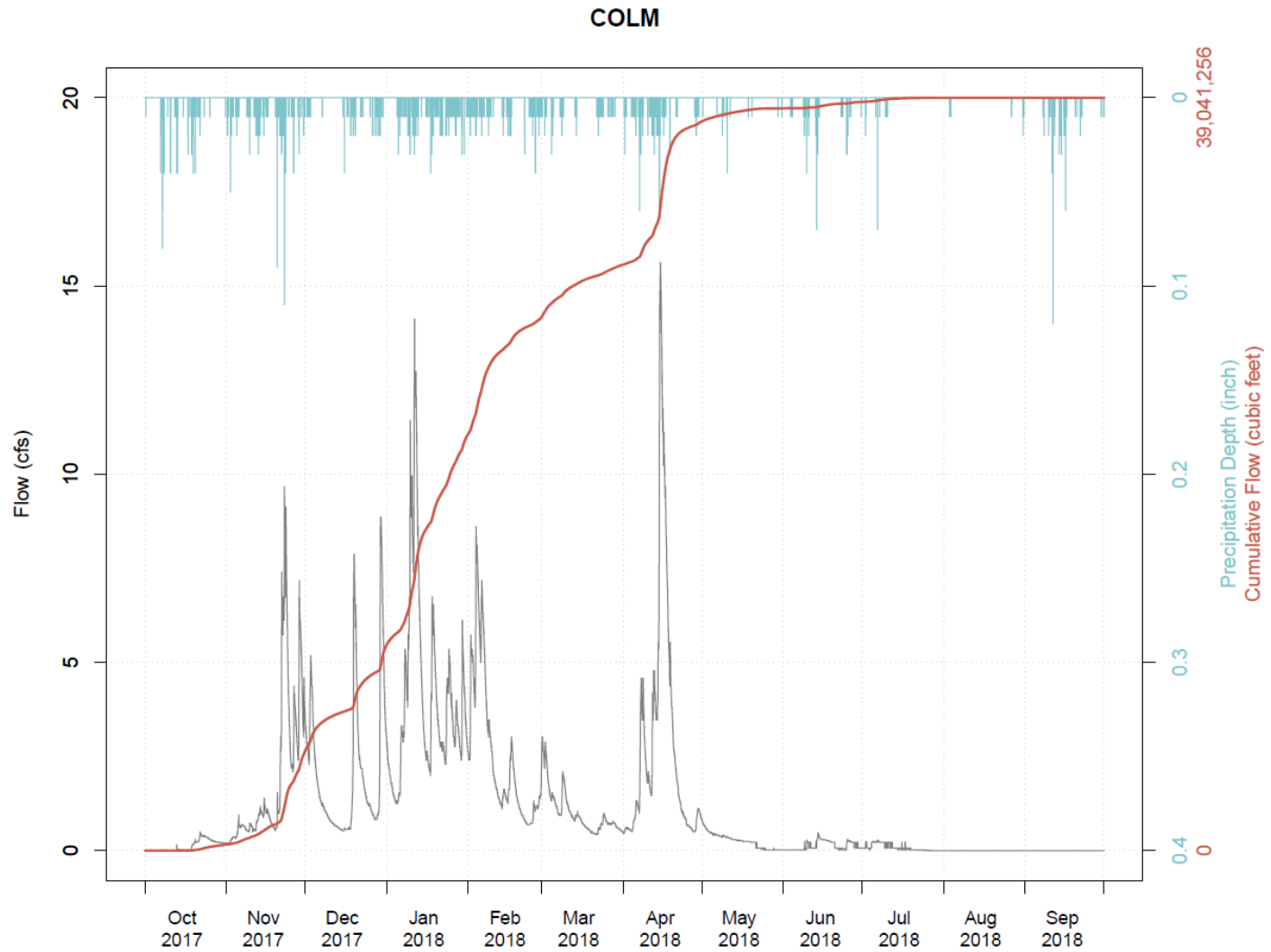


Figure A-8. Continuous Flow, Cumulative Flow, and Precipitation Depth Measured at the COLM Station.

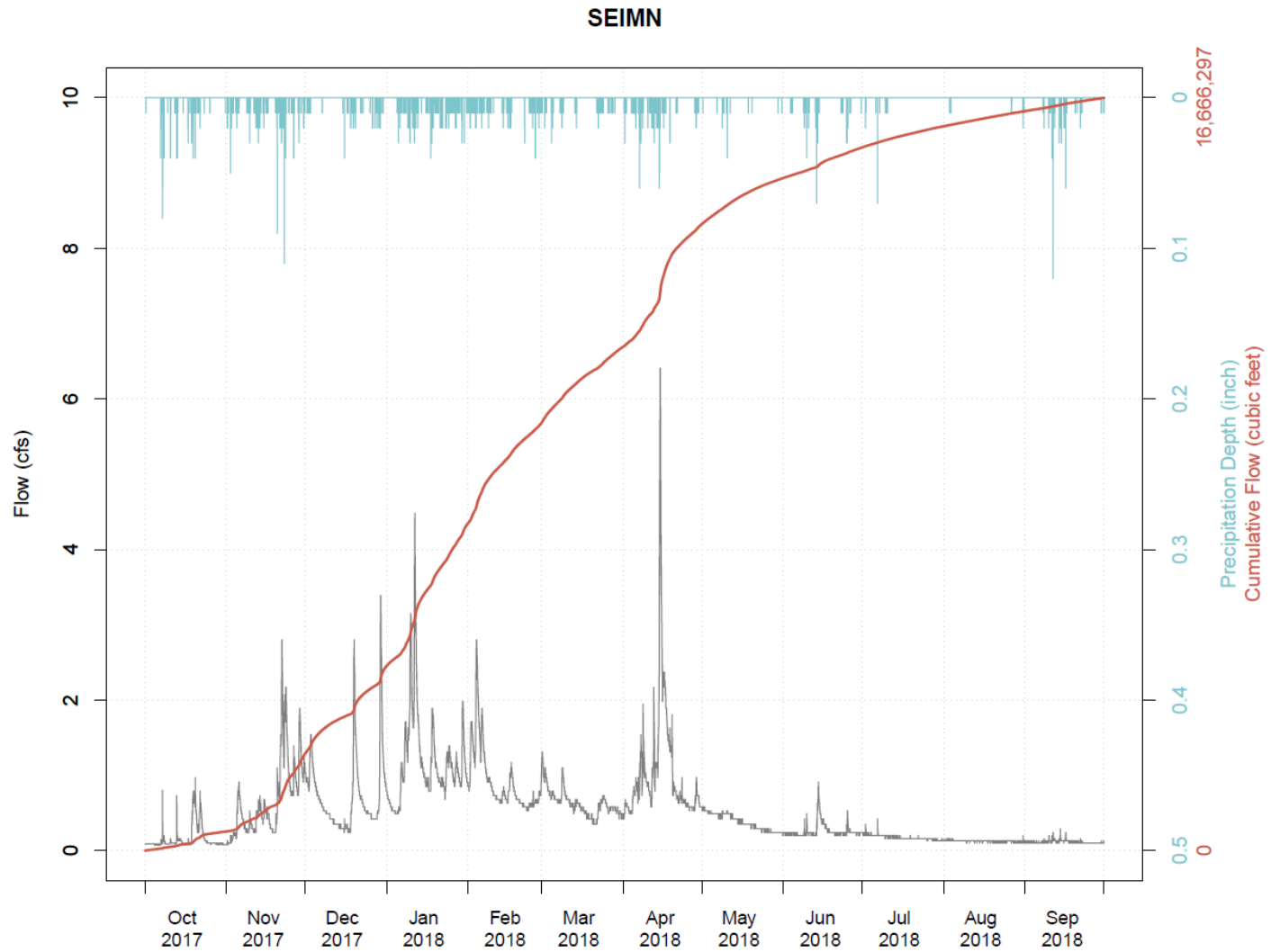


Figure A-9. Continuous Flow, Cumulative Flow, and Precipitation Depth Measured at the SEIMN Station.

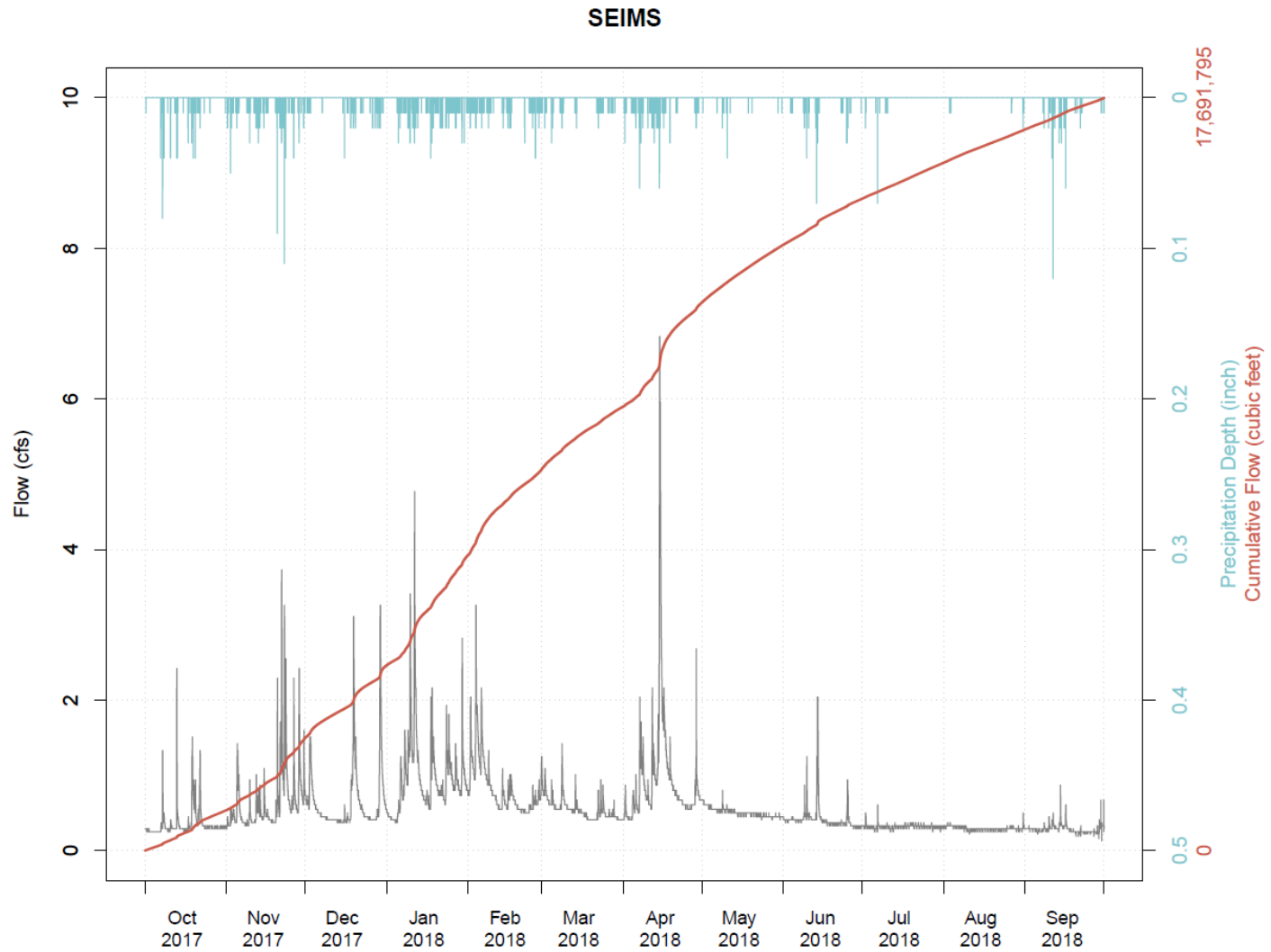


Figure A-10. Continuous Flow, Cumulative Flow, and Precipitation Depth Measured at the SEIMS Station.

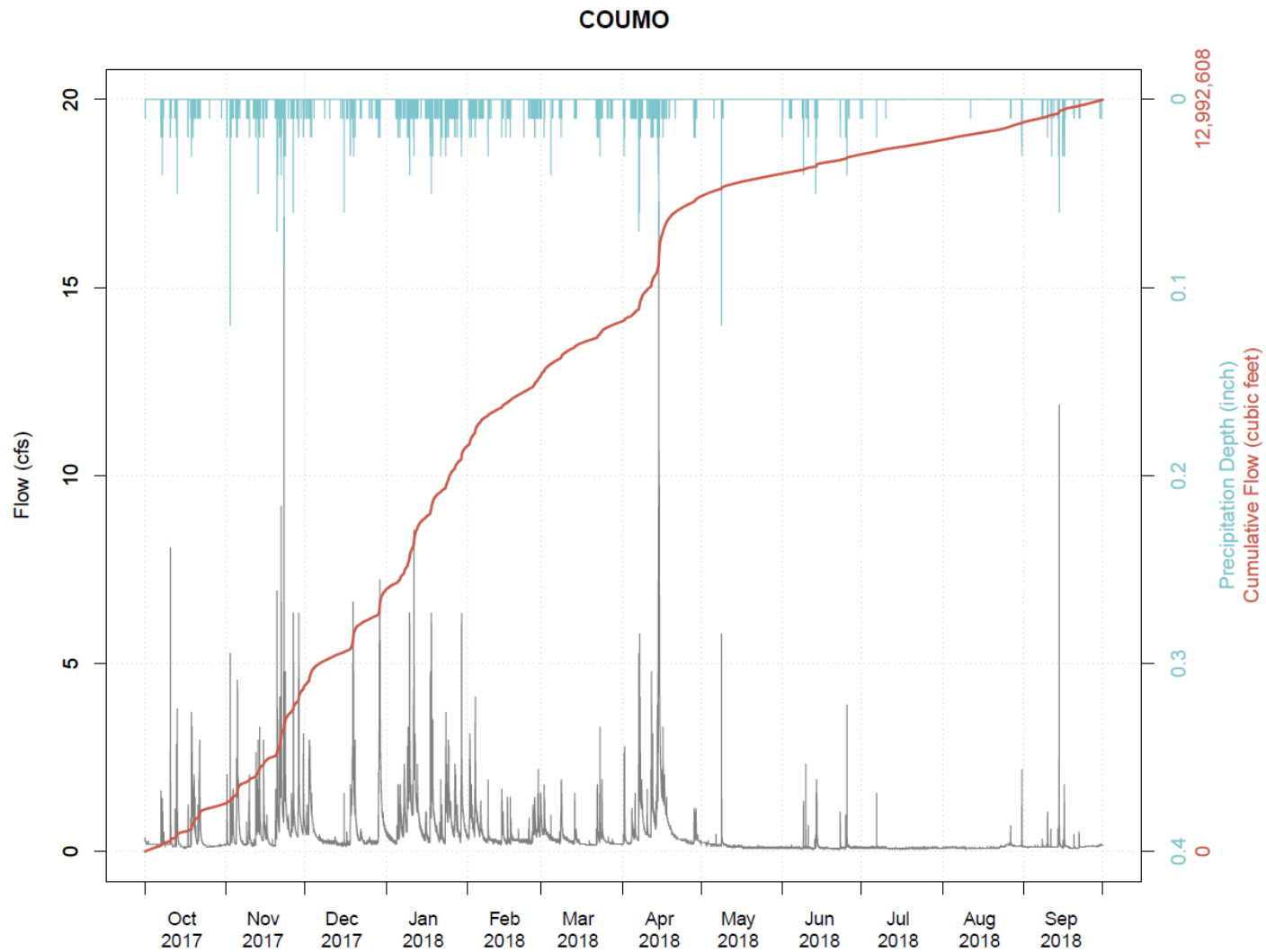


Figure A-11. Continuous Flow, Cumulative Flow, and Precipitation Depth Measured at the COUMO Station.

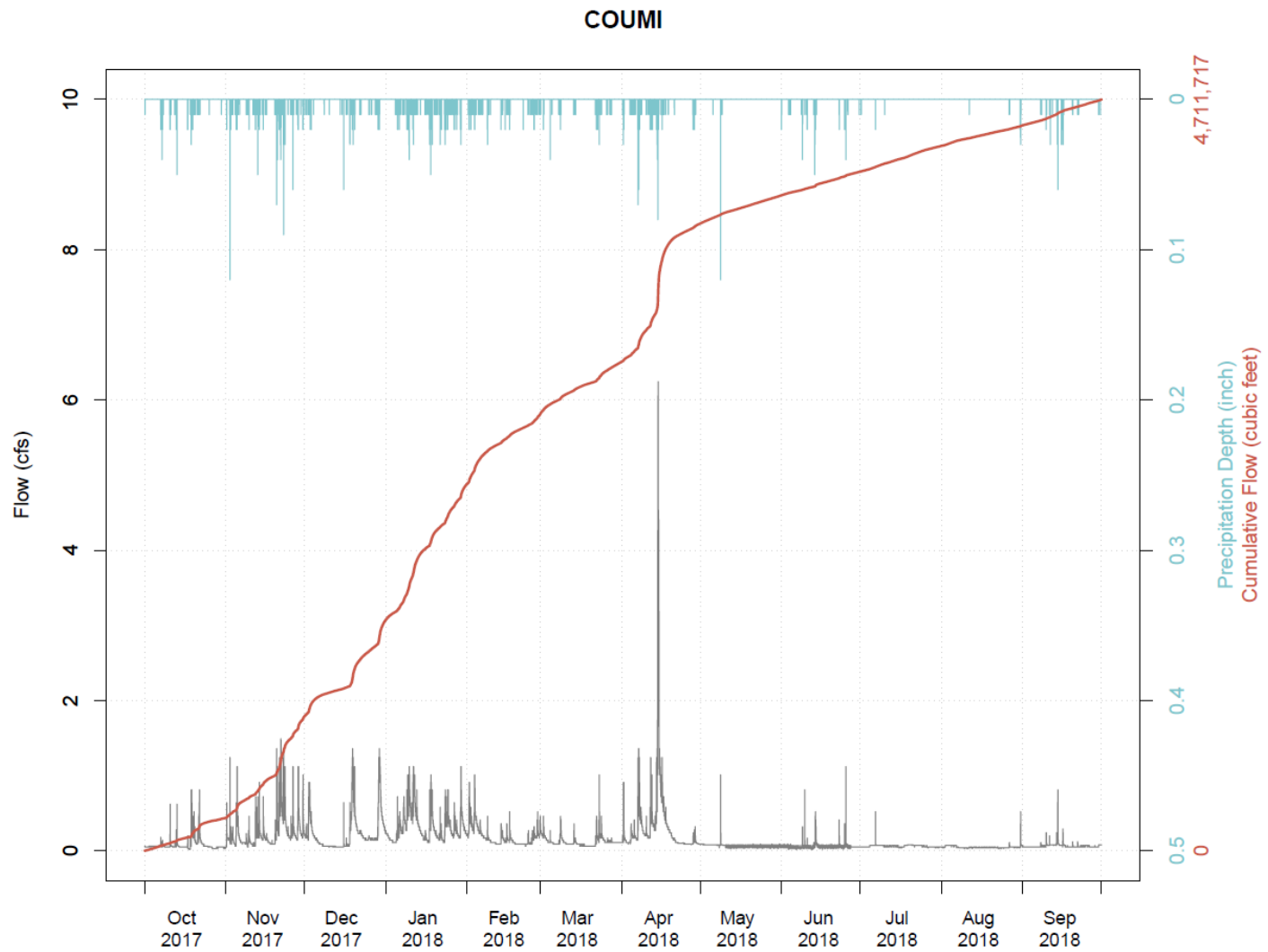


Figure A-12. Continuous Flow, Cumulative Flow, and Precipitation Depth Measured at the COUMI Station.

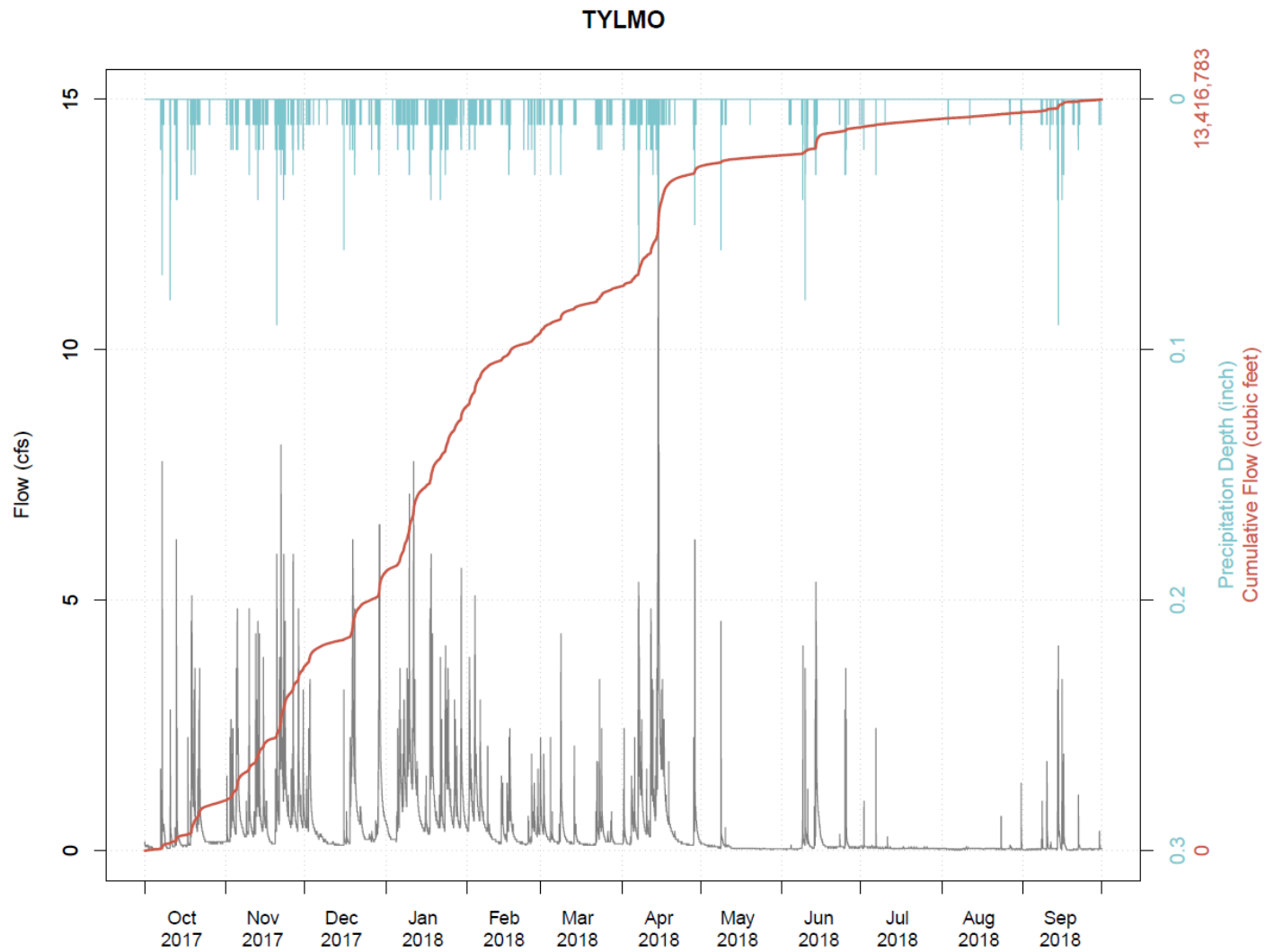


Figure A-13. Continuous Flow, Cumulative Flow, and Precipitation Depth Measured at the TYLMO Station.

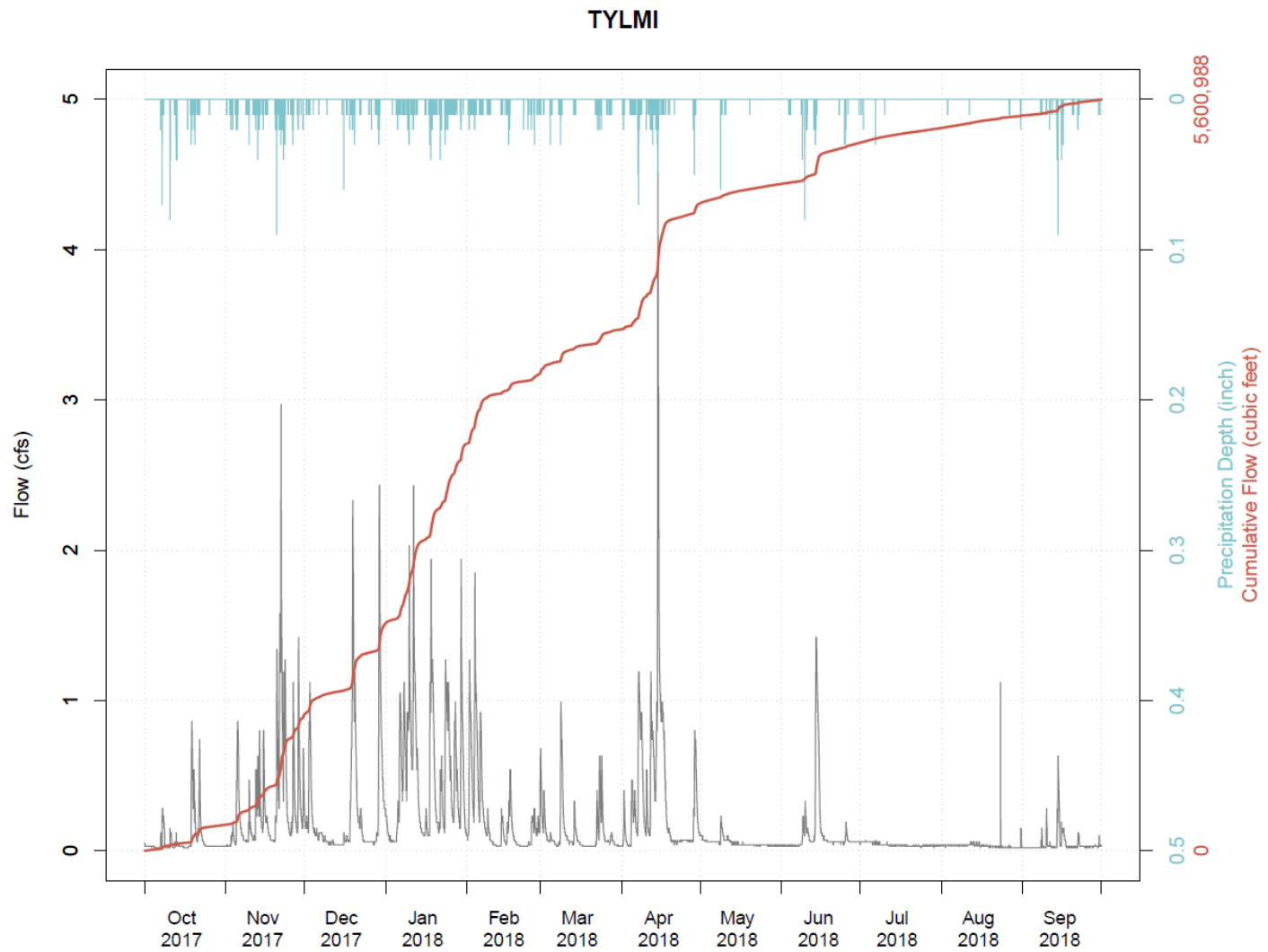


Figure A-14. Continuous Flow, Cumulative Flow, and Precipitation Depth Measured at the TYLMI Station.

APPENDIX B

Data Quality Assurance Review Memorandum for Hydrologic Monitoring



King County

Water and Land Resources Division

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TECHNICAL MEMORANDUM

March 21, 2019

TO: Dylan Ahern, Associate Scientist, Herrera

FM: David Funke, Science and Technical Support Section, Water and Land Resources Division, Department of Natural Resources and Parks

RE: RPWS Hydrologic Data QA Memo

Introduction

This memo summarizes the results of the Quality Assurance review of hydrologic data collected by King County Department of Natural Resources (KCDNRP), Water and Land Resources Division (WLRD), Hydrologic Monitoring Program for the Redmond Paired Watershed Study for the period ending December 31, 2018. Streamflow is determined at 14 sites for the study. Water temperature is recorded at all 14 sites and conductivity loggers were deployed at eight sites for the 2018 water year.

Quality Assurance Review of Data

QA Review Methods

While all 14 project stream gages are updated via telemetry, ultimately the final continuous hydrologic data is input into the King County Hydrologic database with a supervised process using a desktop computer application. The technician works from a plot (printed chart created in a spreadsheet) of the continuous values for a set period, usually 4 to 8 weeks and bracketed by field observations. For discharge data, the water level corrections, rating table and shifts used are noted on the plot, along with explanatory notes. The plot is stored in the project file for the gage along with field notes and other materials. Rating curve development and gage problem solving occurs in a collegial environment with the team staff. Recorded data and field

measurements are reviewed throughout the year to identify problems and target necessary measurements.

Annual review of the water year is performed after the final supervised workup. Data are reviewed by a different team member than who performed the initial workup. A spreadsheet template is used with daily mean, max and min values, rainfall, comparison gages, field observations, and a QC checklist to structure the review. The review process is described in the STREAM GAGE DATA WORKUP QA/QC section below.

RPWS WY 2018 and Calendar Year 2018

Rainfall totals were above average for November 2017, and January and April 2018. Over 2 inches in 24 hours were recorded April 14–15 in the Redmond area, producing the peak flow for the water year and calendar year 2018. Summer 2018 was dry, with less than 4 inches of rain for May through August, with much of it falling over 2 days mid-June.

Ten largest 24-hour rain totals from the Monticello rain gage are listed below with direct measurements of stream discharge were made during the shaded storms:

| End Date | 24 hr total, inch |
|------------|-------------------|
| 4/15/2018 | 2.29 |
| 11/22/2017 | 1.69 |
| 12/19/2017 | 1.56 |
| 12/29/2017 | 1.49 |
| 11/27/2018 | 1.42 |
| 6/14/2018 | 1.40 |
| 10/19/2017 | 1.29 |
| 1/18/2018 | 1.24 |
| 10/28/2018 | 1.22 |
| 1/9/2018 | 1.18 |

COLM Colin Creek Mid Site

The record is fair, with the stream mostly dry in August and September.

COUMO Country Creek at Mouth

Record fair. Frequent scour and fill at this site necessitates rating shifts. Peak recorded discharge 5.3 cfs in April. Sediment affected working of the water level sensor and the back up 15-minute sensor record was used for extensive periods.

COUMI Country Creek Mid Site

Record poor. Scour and fill at this site necessitates rating shifts. Observed channel hydraulics during April 14–15 storm made water level record unreliable. The main gage water level sensor seemed to work poorly in May and June so the 15-minute record from the backup sensor was used. Maintenance improved the subsequent readings. Low resolution hydraulic control.

EVALSS Evans Lower Stream Site

Record good. Peak recorded discharge 20 cfs; highest discharge measurement 11 cfs. The new rating curve after the 2017 scour event is reasonably stable. The instrumentation functioned well throughout the period.

EVAMSS Evans Mid Stream Site

Record fair. Peak flow for period 5.8 cfs; maximum measured was 4.4 cfs. Scour and fill at this site necessitates rating shifts. Low flow periods have potential for large per cent error.

MONMO Monticello Mouth Site

Record good. Water level measured behind a metal weir, but flow is very turbulent during stormflow. Peak recorded discharge 32 cfs; highest discharge measurement 28 cfs.

MONMN Monticello Mid North Site

Record poor. Channel not conducive to stable rating. Peak discharge 23 cfs for period; highest flow measurement 12 cfs. There were many non-storm related discharges to the channel.

MONMS Monticello Mid South Site

Record fair. Flow goes very low at times. Difficult to measure low flows. Peak discharge 4.4 cfs for period; highest discharge measurement 3.6 cfs.

SEIMN Seidel Mid North Site (formerly 02o)

Record fair. Stream gage operated at this site since 2008. Water level measured behind an old existing concrete weir. There is some evidence that the sediment load is increasing in the channel making the weir rating less stable. Two large flow peaks in April likely due to impounded water upstream being released. Peak discharge 11 cfs for period; highest discharge measurement 4.1 cfs.

SEIMS Seidel Mid South Site (formerly 02p)

Record fair. Stream gage operated at this site since 2008. Water level measured behind an old existing concrete flume structure. Peak discharge 6.8 cfs for period; highest discharge measurement 3.1 cfs.

TOSMO Tosh Mouth Site

Record good except for peak flows above 12 cfs. Water level measured behind a concrete weir, but flow is not contained in the notch during high stormflows. Peak recorded discharge 18 cfs; highest discharge measurement 8.3 cfs.

TOSMI Tosh Mid Site

Record poor. The channel here gives a low resolution rating. Access to the site is difficult. Peak recorded discharge 14 cfs; highest discharge measurement 5.1 cfs.

TYLMO Tyler Mouth Site

Record fair. Water level measured behind a metal weir, but the channel is silted in such that there is not a level pool. Very flashy response to rainfall. Peak recorded discharge 15 cfs; highest discharge measurement 3.0 cfs.

TYLMI Tyler Mid Site

Record poor. Water level measured at outlet to 4.5-foot-diameter culvert, behind a rock control. Stream reacts quickly to rainfall due to nearby street runoff directed to the channel. The site has suffered numerous alterations to the channel by unknown parties, which necessitates many rating corrections. Peak recorded discharge 4.5 cfs; highest discharge measurement 2.3 cfs

STREAM GAGE DATA WORKUP QA/QC

A streamflow data workup should be checked by another technician before approving the data for publication. This is not a rote process or simple checklist. It requires an understanding of the basic elements of a data workup as well as a questioning attitude. The check can go pretty quickly if the person doing the original workup has taken good notes, kept the file in good order, made the necessary graphs and reports, and did not make any mistakes. The QA/QC check should be performed by someone other than the person who did the original workup. This ensures that we get a realistic assessment of the coherence and legibility of the workup and documentation. We want to be able to return to the file at a later date and figure out how the flow data were derived from the primary data. We also want to make sure that the data make sense and contain no errors. Of course, we will never know if our flow data are accurate, but we can know that they are the best numbers possible if rating tables are well developed and the rating properly applied to a carefully corrected stage record. The following steps are outlined in the order they should occur.

Three Objectives

1. Well documented work, so in the future we can figure out what was done and why. If the file and notes are a mess and don't make sense, you give it back and tell them to get it together.
2. Careful work, i.e. no stupid or gross mistakes. No gaps, no big jumps in discharge when there shouldn't be, flow in data table matches the discharge measurement made at that time, sensor garbage is cleaned up. Stupid mistake example: the flow record changes 15% in one log between sessions because the initial sensor correction was set incorrectly.
3. Technically defensible work, no errors in judgment. Rating curves make sense, stage corrections are reasonable, rating shifts applied appropriately, estimated periods make sense.

QA/QC Steps to Checking Flow Records

Documentation

There may be some minor problems with the file organization that did not affect the workup quality. These the checker can fix. Make sure that:

- The paper file is organized correctly
- There is a workup cover sheet with session by session notes
- Workup charts are all there and gaps noted, workup detail is written on the chart
- Discharge Measurement Summary form is up to date
- Flows are correctly plotted on rating curve
- Data input files are stored correctly

- Water year QA spreadsheet is complete (use StreamGage_WaterYear_Report.xlsx template). Charts titles should be correct, rain gage and comparison gage data included, also any continuous water temperature or other water quality data if applicable.

Look for Mistakes

- Is water year complete? Complete 15-minute years have 35,040 records; leap years 35,136 (5-minute have 105,120). Missing data will reduce that number. The logs for the year are displayed on the workup screen. Also, missing data will be held with asterisks in the 15-minute report. Dump the report into excel and sort by value.
- Compare the graph of the daily mean and max flow to that of an equivalent gage. You are looking at the timing and relative magnitude of peaks and low flow periods.
- Examine daily mean and min flows chart. You are looking for periods where the flow drops unrealistically, usually due to sensor problems, a negative value, or a mistaken filled value.
- Check the data table at date and time of discharge measurements. The record should match the flow or there should be a good reason why in the notes.
- Check the plotting of each flow measurement on the rating curve. Sometimes the offset is incorrectly added, or it is just put in the wrong place. It can look right and be wrong, so check.
- Give flow measurements a once over to make sure they are sensible, $V \cdot A = Q$, the calculated width seems right given the start and end of the cross section. Pay special attention to high flow measurements or any flow that shifts off the normal rating.
- Does the flow record connect well? No unjustified jumps in the discharge between sessions, stage corrections or other events.
- Are estimate periods flagged correctly?

Technical Quality

- Can you understand what rating curves were used, and what they are based on? What defines the high end?
- If the high end depends on a curve extension, are there indirect discharge calculations made to justify the peak flow estimate? Do you agree? This is a highly subjective area that bears careful examination. We expect, of course, that consultation was done during the initial workup, so there will be no big surprises.
- Are base flows accurate? It may be more accurate to estimate low flow periods or fill the stage record than use stage record with known error.
- Check how daily flow estimates to fill gaps were made.
- Compare mean daily discharge with an appropriate nearby station for timing and magnitude of peaks, baseflow etc.

RPWS WY 2018

3/21/2019

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Final Approval

If everything is in order, or after corrections have been made, complete QC checklist sheet in the Water Year spreadsheet. Printout checklist for the paper file. Include name and date.

APPENDIX C

Discharge Rating Curves

Table C-1. Rating Curves Used to Estimate Discharge at EVALSS.

| EVALSS Table 04 | |
|---------------------|--------------------|
| Water Level (ft) | Discharge (cfs) |
| 0.12 | 0.60 |
| 0.13 | 0.71 |
| 0.14 | 0.82 |
| 0.15 | 0.95 |
| 0.16 | 1.08 |
| 0.17 | 1.22 |
| 0.18 | 1.38 |
| 0.19 | 1.54 |
| 0.20 | 1.71 |
| 0.21 | 1.89 |
| 0.22 | 2.08 |
| 0.23 | 2.27 |
| 0.24 | 2.48 |
| 0.25 | 2.70 |
| 0.26 | 2.92 |
| 0.27 | 3.16 |
| 0.28 | 3.40 |
| 0.29 | 3.65 |
| 0.30 | 3.91 |
| 0.31 | 4.17 |
| 0.32 | 4.45 |
| 0.33 | 4.73 |
| 0.34 | 5.03 |
| 0.35 | 5.33 |
| 0.36 | 5.64 |
| 0.37 | 5.96 |
| 0.38 | 6.29 |
| 0.39 | 6.63 |
| 0.40 | 6.98 |
| 0.41 | 7.33 |
| 0.42 | 7.70 |
| 0.43 | 8.07 |
| 0.44 | 8.45 |
| 0.45 | 8.84 |
| 0.46 | 9.24 |
| 0.47 | 9.65 |
| 0.48 | 10.07 |
| 0.49 | 10.50 |
| 0.50 | 10.93 |
| 0.51 | 11.38 |
| 0.52 | 11.83 |
| 0.53 | 12.30 |
| 0.54 | 12.77 |
| 0.55 | 13.25 |

Table C-1. Rating Curves Used to Estimate Discharge at EVALSS.

| EVALSS Table 04 | |
|---------------------|--------------------|
| Water Level (ft) | Discharge (cfs) |
| 0.56 | 13.74 |
| 0.57 | 14.24 |
| 0.58 | 14.74 |
| 0.59 | 15.26 |
| 0.60 | 15.79 |
| 0.61 | 16.32 |
| 0.62 | 16.87 |
| 0.63 | 17.42 |
| 0.64 | 17.98 |
| 0.65 | 18.55 |
| 0.66 | 19.13 |
| 0.67 | 19.72 |
| 0.68 | 20.31 |
| 0.69 | 20.92 |
| 0.70 | 21.54 |
| 0.71 | 22.16 |
| 0.72 | 22.79 |
| 0.73 | 23.44 |
| 0.74 | 24.09 |
| 0.75 | 24.75 |
| 0.76 | 25.42 |
| 0.77 | 26.10 |
| 0.78 | 26.78 |
| 0.79 | 27.48 |
| 0.80 | 28.18 |
| 0.81 | 28.90 |
| 0.82 | 29.62 |
| 0.83 | 30.35 |
| 0.84 | 31.10 |
| 0.85 | 31.85 |
| 0.86 | 32.60 |
| 0.87 | 33.37 |
| 0.88 | 34.15 |
| 0.89 | 34.94 |
| 0.90 | 35.73 |
| 0.91 | 36.54 |
| 0.92 | 37.35 |
| 0.93 | 38.17 |
| 0.94 | 39.00 |
| 0.95 | 39.84 |
| 0.96 | 40.69 |
| 0.97 | 41.55 |
| 0.98 | 42.42 |
| 0.99 | 43.30 |

Table C-1. Rating Curves Used to Estimate Discharge at EVALSS.

| EVALSS Table 04 | |
|---------------------|--------------------|
| Water Level (ft) | Discharge (cfs) |
| 1.00 | 44.18 |
| 1.01 | 45.08 |
| 1.02 | 45.98 |
| 1.03 | 46.89 |
| 1.04 | 47.81 |
| 1.05 | 48.75 |
| 1.06 | 49.68 |
| 1.07 | 50.63 |
| 1.08 | 51.59 |
| 1.09 | 52.56 |
| 1.10 | 53.53 |
| 1.11 | 54.52 |
| 1.12 | 55.51 |
| 1.13 | 56.52 |
| 1.14 | 57.53 |
| 1.15 | 58.55 |
| 1.16 | 59.58 |
| 1.17 | 60.62 |
| 1.18 | 61.67 |
| 1.19 | 62.73 |
| 1.20 | 63.79 |
| 1.21 | 64.87 |
| 1.22 | 65.95 |
| 1.23 | 67.05 |
| 1.24 | 68.15 |
| 1.25 | 69.26 |
| 1.26 | 70.38 |
| 1.27 | 71.51 |
| 1.28 | 72.65 |
| 1.29 | 73.80 |
| 1.30 | 74.95 |
| 1.31 | 76.12 |
| 1.32 | 77.30 |
| 1.33 | 78.48 |
| 1.34 | 79.67 |
| 1.35 | 80.88 |
| 1.36 | 82.09 |
| 1.37 | 83.31 |
| 1.38 | 84.54 |
| 1.39 | 85.78 |
| 1.40 | 87.02 |
| 1.41 | 88.28 |
| 1.42 | 89.55 |

Table C-1. Rating Curves Used to Estimate Discharge at EVALSS.

| EVALSS Table 04 | |
|---------------------|--------------------|
| Water Level (ft) | Discharge (cfs) |
| 1.43 | 90.82 |
| 1.44 | 92.11 |
| 1.45 | 93.40 |
| 1.46 | 94.70 |
| 1.47 | 96.01 |
| 1.48 | 97.33 |
| 1.49 | 98.66 |
| 1.50 | 100.00 |

Table C-2. Rating Curves Used to Estimate Discharge at EVAMS.

| EVAMS Table 03 | | EVAMS Table 04 | |
|---------------------|--------------------|---------------------|--------------------|
| Water Level (ft) | Discharge (cfs) | Water Level (ft) | Discharge (cfs) |
| 0.14 | 0.10 | 0.13 | 0.10 |
| 0.15 | 0.13 | 0.14 | 0.13 |
| 0.16 | 0.16 | 0.15 | 0.17 |
| 0.17 | 0.20 | 0.16 | 0.21 |
| 0.18 | 0.25 | 0.17 | 0.26 |
| 0.19 | 0.30 | 0.18 | 0.32 |
| 0.20 | 0.37 | 0.19 | 0.39 |
| 0.21 | 0.44 | 0.20 | 0.47 |
| 0.22 | 0.52 | 0.21 | 0.57 |
| 0.23 | 0.61 | 0.22 | 0.67 |
| 0.24 | 0.72 | 0.23 | 0.79 |
| 0.25 | 0.83 | 0.24 | 0.92 |
| 0.26 | 0.96 | 0.25 | 1.06 |
| 0.27 | 1.10 | 0.26 | 1.22 |
| 0.28 | 1.22 | 0.27 | 1.40 |
| 0.29 | 1.35 | 0.28 | 1.60 |
| 0.30 | 1.48 | 0.29 | 1.74 |
| 0.31 | 1.62 | 0.30 | 1.90 |
| 0.32 | 1.78 | 0.31 | 2.06 |
| 0.33 | 1.94 | 0.32 | 2.22 |
| 0.34 | 2.11 | 0.33 | 2.40 |
| 0.35 | 2.29 | 0.34 | 2.58 |
| 0.36 | 2.47 | 0.35 | 2.78 |
| 0.37 | 2.67 | 0.36 | 2.98 |
| 0.38 | 2.88 | 0.37 | 3.18 |
| 0.39 | 3.10 | 0.38 | 3.40 |
| 0.40 | 3.33 | 0.39 | 3.63 |
| 0.41 | 3.57 | 0.40 | 3.86 |
| 0.42 | 3.82 | 0.41 | 4.10 |
| 0.43 | 4.08 | 0.42 | 4.35 |
| 0.44 | 4.35 | 0.43 | 4.61 |
| 0.45 | 4.64 | 0.44 | 4.88 |
| 0.46 | 4.94 | 0.45 | 5.16 |
| 0.47 | 5.24 | 0.46 | 5.45 |
| 0.48 | 5.56 | 0.47 | 5.75 |
| 0.49 | 5.90 | 0.48 | 6.05 |
| 0.50 | 6.24 | 0.49 | 6.37 |
| 0.51 | 6.60 | 0.50 | 6.69 |
| 0.52 | 6.97 | 0.51 | 7.03 |
| 0.53 | 7.36 | 0.52 | 7.38 |
| 0.54 | 7.75 | 0.53 | 7.73 |
| 0.55 | 8.17 | 0.54 | 8.10 |
| 0.56 | 8.59 | 0.55 | 8.47 |
| 0.57 | 9.03 | 0.56 | 8.86 |
| 0.58 | 9.48 | 0.57 | 9.25 |
| 0.59 | 9.95 | 0.58 | 9.66 |
| 0.60 | 10.43 | 0.59 | 10.07 |
| 0.61 | 10.93 | 0.60 | 10.50 |

Table C-2. Rating Curves Used to Estimate Discharge at EVAMS.

| EVAMS Table 03 | | EVAMS Table 04 | |
|---------------------|--------------------|---------------------|--------------------|
| Water Level (ft) | Discharge (cfs) | Water Level (ft) | Discharge (cfs) |
| 0.62 | 11.44 | 0.61 | 11.00 |
| 0.63 | 11.97 | 0.62 | 11.51 |
| 0.64 | 12.51 | 0.63 | 12.04 |
| 0.65 | 13.07 | 0.64 | 12.58 |
| 0.66 | 13.65 | 0.65 | 13.14 |
| 0.67 | 14.24 | 0.66 | 13.72 |
| 0.68 | 14.84 | 0.67 | 14.31 |
| 0.69 | 15.47 | 0.68 | 14.92 |
| 0.70 | 16.11 | 0.69 | 15.54 |
| 0.71 | 16.76 | 0.70 | 16.18 |
| 0.72 | 17.44 | 0.71 | 16.84 |
| 0.73 | 18.13 | 0.72 | 17.51 |
| 0.74 | 18.84 | 0.73 | 18.20 |
| 0.75 | 19.56 | 0.74 | 18.91 |
| 0.76 | 20.31 | 0.75 | 19.63 |
| 0.77 | 21.07 | 0.76 | 20.38 |
| 0.78 | 21.85 | 0.77 | 21.14 |
| 0.79 | 22.65 | 0.78 | 21.92 |
| 0.80 | 23.47 | 0.79 | 22.71 |
| 0.81 | 24.30 | 0.80 | 23.53 |
| 0.82 | 25.16 | 0.81 | 24.36 |
| 0.83 | 26.03 | 0.82 | 25.22 |
| 0.84 | 26.92 | 0.83 | 26.09 |
| 0.85 | 27.84 | 0.84 | 26.98 |
| 0.86 | 28.77 | 0.85 | 27.89 |
| 0.87 | 29.72 | 0.86 | 28.82 |
| 0.88 | 30.69 | 0.87 | 29.77 |
| 0.89 | 31.69 | 0.88 | 30.74 |
| 0.90 | 32.70 | 0.89 | 31.73 |
| 0.91 | 33.73 | 0.90 | 32.74 |
| 0.92 | 34.79 | 0.91 | 33.77 |
| 0.93 | 35.86 | 0.92 | 34.82 |
| 0.94 | 36.96 | 0.93 | 35.90 |
| 0.95 | 38.08 | 0.94 | 36.99 |
| 0.96 | 39.22 | 0.95 | 38.10 |
| 0.97 | 40.38 | 0.96 | 39.24 |
| 0.98 | 41.57 | 0.97 | 40.40 |
| 0.99 | 42.77 | 0.98 | 41.58 |
| 1.00 | 44.00 | 0.99 | 42.78 |
| | | 1.00 | 44.00 |

Table C-3. Rating Curves Used to Estimate Discharge at MONM.

| MONM Table 04 | |
|---------------------|--------------------|
| Water Level (ft) | Discharge (cfs) |
| 0.01 | 0.01 |
| 0.02 | 0.02 |
| 0.03 | 0.03 |
| 0.04 | 0.04 |
| 0.05 | 0.04 |
| 0.06 | 0.05 |
| 0.07 | 0.06 |
| 0.08 | 0.07 |
| 0.09 | 0.08 |
| 0.10 | 0.08 |
| 0.11 | 0.09 |
| 0.12 | 0.10 |
| 0.13 | 0.12 |
| 0.14 | 0.15 |
| 0.15 | 0.18 |
| 0.16 | 0.21 |
| 0.17 | 0.24 |
| 0.18 | 0.28 |
| 0.19 | 0.32 |
| 0.20 | 0.36 |
| 0.21 | 0.41 |
| 0.22 | 0.46 |
| 0.23 | 0.51 |
| 0.24 | 0.57 |
| 0.25 | 0.63 |
| 0.26 | 0.70 |
| 0.27 | 0.77 |
| 0.28 | 0.84 |
| 0.29 | 0.92 |
| 0.30 | 1.00 |
| 0.31 | 1.09 |
| 0.32 | 1.18 |
| 0.33 | 1.28 |
| 0.34 | 1.39 |
| 0.35 | 1.49 |
| 0.36 | 1.61 |
| 0.37 | 1.73 |
| 0.38 | 1.85 |
| 0.39 | 1.98 |
| 0.40 | 2.12 |
| 0.41 | 2.26 |
| 0.42 | 2.40 |
| 0.43 | 2.55 |
| 0.44 | 2.71 |
| 0.45 | 2.87 |
| 0.46 | 3.04 |
| 0.47 | 3.22 |

Table C-3. Rating Curves Used to Estimate Discharge at MONM.

| MONM Table 04 | |
|---------------------|--------------------|
| Water Level (ft) | Discharge (cfs) |
| 0.48 | 3.40 |
| 0.49 | 3.59 |
| 0.50 | 3.78 |
| 0.51 | 3.98 |
| 0.52 | 4.19 |
| 0.53 | 4.40 |
| 0.54 | 4.62 |
| 0.55 | 4.85 |
| 0.56 | 5.08 |
| 0.57 | 5.32 |
| 0.58 | 5.57 |
| 0.59 | 5.82 |
| 0.60 | 6.08 |
| 0.61 | 6.35 |
| 0.62 | 6.62 |
| 0.63 | 6.91 |
| 0.64 | 7.19 |
| 0.65 | 7.49 |
| 0.66 | 7.79 |
| 0.67 | 8.11 |
| 0.68 | 8.42 |
| 0.69 | 8.75 |
| 0.70 | 9.09 |
| 0.71 | 9.43 |
| 0.72 | 9.78 |
| 0.73 | 10.13 |
| 0.74 | 10.50 |
| 0.75 | 10.81 |
| 0.76 | 11.13 |
| 0.77 | 11.45 |
| 0.78 | 11.78 |
| 0.79 | 12.12 |
| 0.80 | 12.45 |
| 0.81 | 12.80 |
| 0.82 | 13.15 |
| 0.83 | 13.50 |
| 0.84 | 13.83 |
| 0.85 | 14.16 |
| 0.86 | 14.49 |
| 0.87 | 14.83 |
| 0.88 | 15.17 |
| 0.89 | 15.52 |
| 0.90 | 15.87 |
| 0.91 | 16.22 |
| 0.92 | 16.58 |
| 0.93 | 16.94 |
| 0.94 | 17.30 |

Table C-3. Rating Curves Used to Estimate Discharge at MONM.

| MONM Table 04 | |
|---------------------|--------------------|
| Water Level (ft) | Discharge (cfs) |
| 0.95 | 17.67 |
| 0.96 | 18.05 |
| 0.97 | 18.42 |
| 0.98 | 18.80 |
| 0.99 | 19.19 |
| 1.00 | 19.58 |
| 1.01 | 19.97 |
| 1.02 | 20.37 |
| 1.03 | 20.77 |
| 1.04 | 21.17 |
| 1.05 | 21.58 |
| 1.06 | 21.99 |
| 1.07 | 22.41 |
| 1.08 | 22.83 |
| 1.09 | 23.25 |
| 1.10 | 23.68 |
| 1.11 | 24.11 |
| 1.12 | 24.54 |
| 1.13 | 24.98 |
| 1.14 | 25.43 |
| 1.15 | 25.87 |
| 1.16 | 26.32 |
| 1.17 | 26.78 |
| 1.18 | 27.24 |
| 1.19 | 27.70 |
| 1.20 | 28.17 |
| 1.21 | 28.64 |
| 1.22 | 29.11 |
| 1.23 | 29.59 |
| 1.24 | 30.07 |
| 1.25 | 30.56 |
| 1.26 | 31.05 |
| 1.27 | 31.54 |
| 1.28 | 32.04 |
| 1.29 | 32.54 |
| 1.30 | 33.04 |
| 1.31 | 33.55 |
| 1.32 | 34.06 |
| 1.33 | 34.58 |
| 1.34 | 35.10 |
| 1.35 | 35.63 |
| 1.36 | 36.15 |
| 1.37 | 36.69 |
| 1.38 | 37.22 |
| 1.39 | 37.76 |
| 1.40 | 38.31 |
| 1.41 | 38.86 |

Table C-3. Rating Curves Used to Estimate Discharge at MONM.

| MONM Table 04 | |
|---------------------|--------------------|
| Water Level (ft) | Discharge (cfs) |
| 1.42 | 39.41 |
| 1.43 | 39.96 |
| 1.44 | 40.52 |
| 1.45 | 41.08 |
| 1.46 | 41.65 |
| 1.47 | 42.22 |
| 1.48 | 42.80 |
| 1.49 | 43.38 |
| 1.50 | 43.96 |
| 1.51 | 44.55 |
| 1.52 | 45.14 |
| 1.53 | 45.73 |
| 1.54 | 46.33 |
| 1.55 | 46.93 |
| 1.56 | 47.54 |
| 1.57 | 48.15 |
| 1.58 | 48.76 |
| 1.59 | 49.38 |
| 1.60 | 50.00 |

Table C-4. Rating Curves Used to Estimate Discharge at MONMN.

| MONMN Table 05 | | MONMN Table 06 | | MONMN Table 07 | |
|---------------------|--------------------|---------------------|--------------------|---------------------|--------------------|
| Water Level (ft) | Discharge (cfs) | Water Level (ft) | Discharge (cfs) | Water Level (ft) | Discharge (cfs) |
| 0.13 | 0.01 | 0.13 | 0.02 | 0.24 | 0.02 |
| 0.14 | 0.02 | 0.14 | 0.03 | 0.25 | 0.03 |
| 0.15 | 0.04 | 0.15 | 0.03 | 0.26 | 0.03 |
| 0.16 | 0.05 | 0.16 | 0.04 | 0.27 | 0.04 |
| 0.17 | 0.06 | 0.17 | 0.05 | 0.28 | 0.05 |
| 0.18 | 0.07 | 0.18 | 0.06 | 0.29 | 0.06 |
| 0.19 | 0.09 | 0.19 | 0.08 | 0.30 | 0.07 |
| 0.20 | 0.11 | 0.20 | 0.09 | 0.31 | 0.09 |
| 0.21 | 0.13 | 0.21 | 0.11 | 0.32 | 0.11 |
| 0.22 | 0.15 | 0.22 | 0.13 | 0.33 | 0.13 |
| 0.23 | 0.17 | 0.23 | 0.15 | 0.34 | 0.15 |
| 0.24 | 0.20 | 0.24 | 0.17 | 0.35 | 0.18 |
| 0.25 | 0.23 | 0.25 | 0.20 | 0.36 | 0.21 |
| 0.26 | 0.26 | 0.26 | 0.22 | 0.37 | 0.25 |
| 0.27 | 0.30 | 0.27 | 0.25 | 0.38 | 0.29 |
| 0.28 | 0.34 | 0.28 | 0.27 | 0.39 | 0.34 |
| 0.29 | 0.38 | 0.29 | 0.30 | 0.40 | 0.40 |
| 0.30 | 0.43 | 0.30 | 0.33 | 0.41 | 0.46 |
| 0.31 | 0.48 | 0.31 | 0.36 | 0.42 | 0.53 |
| 0.32 | 0.53 | 0.32 | 0.40 | 0.43 | 0.61 |
| 0.33 | 0.59 | 0.33 | 0.43 | 0.44 | 0.69 |
| 0.34 | 0.66 | 0.34 | 0.47 | 0.45 | 0.79 |
| 0.35 | 0.73 | 0.35 | 0.51 | 0.46 | 0.90 |
| 0.36 | 0.80 | 0.36 | 0.55 | 0.47 | 1.02 |
| 0.37 | 0.88 | 0.37 | 0.59 | 0.48 | 1.15 |
| 0.38 | 0.96 | 0.38 | 0.64 | 0.49 | 1.30 |
| 0.39 | 1.05 | 0.39 | 0.69 | 0.50 | 1.37 |
| 0.40 | 1.15 | 0.40 | 0.74 | 0.51 | 1.45 |
| 0.41 | 1.25 | 0.41 | 0.79 | 0.52 | 1.53 |
| 0.42 | 1.35 | 0.42 | 0.84 | 0.53 | 1.61 |
| 0.43 | 1.47 | 0.43 | 0.90 | 0.54 | 1.70 |
| 0.44 | 1.59 | 0.44 | 0.96 | 0.55 | 1.79 |
| 0.45 | 1.71 | 0.45 | 1.02 | 0.56 | 1.88 |
| 0.46 | 1.85 | 0.46 | 1.09 | 0.57 | 1.97 |
| 0.47 | 1.99 | 0.47 | 1.15 | 0.58 | 2.07 |
| 0.48 | 2.14 | 0.48 | 1.22 | 0.59 | 2.17 |
| 0.49 | 2.29 | 0.49 | 1.29 | 0.60 | 2.27 |
| 0.50 | 2.46 | 0.50 | 1.37 | 0.61 | 2.38 |
| 0.51 | 2.63 | 0.51 | 1.44 | 0.62 | 2.49 |
| 0.52 | 2.81 | 0.52 | 1.52 | 0.63 | 2.60 |
| 0.53 | 3.00 | 0.53 | 1.61 | 0.64 | 2.72 |
| 0.54 | 3.16 | 0.54 | 1.69 | 0.65 | 2.84 |
| 0.55 | 3.33 | 0.55 | 1.78 | 0.66 | 2.96 |
| 0.56 | 3.50 | 0.56 | 1.87 | 0.67 | 3.08 |
| 0.57 | 3.68 | 0.57 | 1.97 | 0.68 | 3.21 |
| 0.58 | 3.87 | 0.58 | 2.06 | 0.69 | 3.34 |
| 0.59 | 4.06 | 0.59 | 2.16 | 0.70 | 3.48 |
| 0.60 | 4.26 | 0.60 | 2.27 | 0.71 | 3.62 |

Table C-4. Rating Curves Used to Estimate Discharge at MONMN.

| MONMN Table 05 | | MONMN Table 06 | | MONMN Table 07 | |
|---------------------|--------------------|---------------------|--------------------|---------------------|--------------------|
| Water Level (ft) | Discharge (cfs) | Water Level (ft) | Discharge (cfs) | Water Level (ft) | Discharge (cfs) |
| 0.61 | 4.46 | 0.61 | 2.37 | 0.72 | 3.76 |
| 0.62 | 4.67 | 0.62 | 2.48 | 0.73 | 4.02 |
| 0.63 | 4.89 | 0.63 | 2.60 | 0.74 | 4.29 |
| 0.64 | 5.11 | 0.64 | 2.71 | 0.75 | 4.58 |
| 0.65 | 5.34 | 0.65 | 2.83 | 0.76 | 4.88 |
| 0.66 | 5.57 | 0.66 | 2.95 | 0.77 | 5.20 |
| 0.67 | 5.81 | 0.67 | 3.08 | 0.78 | 5.53 |
| 0.68 | 6.06 | 0.68 | 3.21 | 0.79 | 5.88 |
| 0.69 | 6.32 | 0.69 | 3.34 | 0.80 | 6.25 |
| 0.70 | 6.58 | 0.70 | 3.48 | 0.81 | 6.63 |
| 0.71 | 6.85 | 0.71 | 3.62 | 0.82 | 7.04 |
| 0.72 | 7.12 | 0.72 | 3.76 | 0.83 | 7.46 |
| 0.73 | 7.41 | 0.73 | 4.02 | 0.84 | 7.90 |
| 0.74 | 7.70 | 0.74 | 4.29 | 0.85 | 8.37 |
| 0.75 | 7.99 | 0.75 | 4.58 | 0.86 | 8.85 |
| 0.76 | 8.30 | 0.76 | 4.88 | 0.87 | 9.36 |
| 0.77 | 8.61 | 0.77 | 5.20 | 0.88 | 9.89 |
| 0.78 | 8.93 | 0.78 | 5.53 | 0.89 | 10.45 |
| 0.79 | 9.25 | 0.79 | 5.88 | 0.90 | 11.02 |
| 0.80 | 9.59 | 0.80 | 6.25 | 0.91 | 11.63 |
| 0.81 | 9.93 | 0.81 | 6.63 | 0.92 | 12.26 |
| 0.82 | 10.28 | 0.82 | 7.04 | 0.93 | 12.91 |
| 0.83 | 10.64 | 0.83 | 7.46 | 0.94 | 13.59 |
| 0.84 | 11.00 | 0.84 | 7.90 | 0.95 | 14.31 |
| 0.85 | 11.38 | 0.85 | 8.37 | 0.96 | 15.05 |
| 0.86 | 11.76 | 0.86 | 8.85 | 0.97 | 15.82 |
| 0.87 | 12.15 | 0.87 | 9.36 | 0.98 | 16.62 |
| 0.88 | 12.55 | 0.88 | 9.89 | 0.99 | 17.45 |
| 0.89 | 12.96 | 0.89 | 10.45 | 1.00 | 18.32 |
| 0.90 | 13.37 | 0.90 | 11.02 | 1.01 | 19.22 |
| 0.91 | 13.79 | 0.91 | 11.63 | 1.02 | 20.15 |
| 0.92 | 14.23 | 0.92 | 12.26 | 1.03 | 21.12 |
| 0.93 | 14.67 | 0.93 | 12.91 | 1.04 | 22.13 |
| 0.94 | 15.12 | 0.94 | 13.59 | 1.05 | 23.17 |
| 0.95 | 15.57 | 0.95 | 14.31 | 1.06 | 24.26 |
| 0.96 | 16.04 | 0.96 | 15.05 | 1.07 | 25.38 |
| 0.97 | 16.52 | 0.97 | 15.82 | 1.08 | 26.55 |
| 0.98 | 17.00 | 0.98 | 16.62 | 1.09 | 27.75 |
| 0.99 | 17.50 | 0.99 | 17.45 | 1.10 | 29.00 |
| 1.00 | 18.00 | 1.00 | 18.32 | | |
| 1.01 | 18.70 | 1.01 | 19.22 | | |
| 1.02 | 19.43 | 1.02 | 20.15 | | |
| 1.03 | 20.17 | 1.03 | 21.12 | | |
| 1.04 | 20.94 | 1.04 | 22.13 | | |
| 1.05 | 21.73 | 1.05 | 23.17 | | |
| 1.06 | 22.54 | 1.06 | 24.26 | | |
| 1.07 | 23.37 | 1.07 | 25.38 | | |
| 1.08 | 24.22 | 1.08 | 26.55 | | |
| 1.09 | 25.10 | 1.09 | 27.75 | | |
| 1.10 | 26.00 | 1.10 | 29.00 | | |

Table C-5. Rating Curves Used to Estimate Discharge at MONMS.

| MONMS Table 02 | | MONMS Table 03 | |
|---------------------|--------------------|---------------------|--------------------|
| Water Level (ft) | Discharge (cfs) | Water Level (ft) | Discharge (cfs) |
| 0.01 | 0.00 | 0.09 | 0.01 |
| 0.02 | 0.00 | 0.10 | 0.01 |
| 0.03 | 0.00 | 0.11 | 0.02 |
| 0.04 | 0.01 | 0.12 | 0.02 |
| 0.05 | 0.01 | 0.13 | 0.03 |
| 0.06 | 0.01 | 0.14 | 0.04 |
| 0.07 | 0.01 | 0.15 | 0.05 |
| 0.08 | 0.01 | 0.16 | 0.06 |
| 0.09 | 0.02 | 0.17 | 0.07 |
| 0.10 | 0.02 | 0.18 | 0.08 |
| 0.11 | 0.02 | 0.19 | 0.09 |
| 0.12 | 0.03 | 0.20 | 0.10 |
| 0.13 | 0.04 | 0.21 | 0.11 |
| 0.14 | 0.04 | 0.22 | 0.12 |
| 0.15 | 0.05 | 0.23 | 0.14 |
| 0.16 | 0.06 | 0.24 | 0.15 |
| 0.17 | 0.06 | 0.25 | 0.16 |
| 0.18 | 0.07 | 0.26 | 0.18 |
| 0.19 | 0.08 | 0.27 | 0.19 |
| 0.20 | 0.09 | 0.28 | 0.21 |
| 0.21 | 0.10 | 0.29 | 0.22 |
| 0.22 | 0.11 | 0.30 | 0.24 |
| 0.23 | 0.12 | 0.31 | 0.26 |
| 0.24 | 0.14 | 0.32 | 0.27 |
| 0.25 | 0.15 | 0.33 | 0.29 |
| 0.26 | 0.16 | 0.34 | 0.31 |
| 0.27 | 0.18 | 0.35 | 0.33 |
| 0.28 | 0.19 | 0.36 | 0.35 |
| 0.29 | 0.21 | 0.37 | 0.37 |
| 0.30 | 0.22 | 0.38 | 0.40 |
| 0.31 | 0.24 | 0.39 | 0.42 |
| 0.32 | 0.26 | 0.40 | 0.44 |
| 0.33 | 0.27 | 0.41 | 0.47 |
| 0.34 | 0.29 | 0.42 | 0.49 |
| 0.35 | 0.31 | 0.43 | 0.52 |
| 0.36 | 0.33 | 0.44 | 0.54 |
| 0.37 | 0.35 | 0.45 | 0.57 |
| 0.38 | 0.37 | 0.46 | 0.60 |
| 0.39 | 0.39 | 0.47 | 0.62 |
| 0.40 | 0.42 | 0.48 | 0.65 |
| 0.41 | 0.44 | 0.49 | 0.68 |
| 0.42 | 0.46 | 0.50 | 0.71 |
| 0.43 | 0.49 | 0.51 | 0.74 |
| 0.44 | 0.51 | 0.52 | 0.77 |
| 0.45 | 0.54 | 0.53 | 0.81 |
| 0.46 | 0.57 | 0.54 | 0.84 |
| 0.47 | 0.59 | 0.55 | 0.87 |
| 0.48 | 0.62 | 0.56 | 0.91 |

Table C-5. Rating Curves Used to Estimate Discharge at MONMS.

| MONMS Table 02 | | MONMS Table 03 | |
|---------------------|--------------------|---------------------|--------------------|
| Water Level (ft) | Discharge (cfs) | Water Level (ft) | Discharge (cfs) |
| 0.49 | 0.65 | 0.57 | 0.94 |
| 0.50 | 0.68 | 0.58 | 0.98 |
| 0.51 | 0.71 | 0.59 | 1.01 |
| 0.52 | 0.74 | 0.60 | 1.05 |
| 0.53 | 0.77 | 0.61 | 1.09 |
| 0.54 | 0.80 | 0.62 | 1.13 |
| 0.55 | 0.84 | 0.63 | 1.17 |
| 0.56 | 0.87 | 0.64 | 1.21 |
| 0.57 | 0.90 | 0.65 | 1.25 |
| 0.58 | 0.94 | 0.66 | 1.29 |
| 0.59 | 0.98 | 0.67 | 1.33 |
| 0.60 | 1.01 | 0.68 | 1.37 |
| 0.61 | 1.05 | 0.69 | 1.42 |
| 0.62 | 1.09 | 0.70 | 1.46 |
| 0.63 | 1.13 | 0.71 | 1.51 |
| 0.64 | 1.17 | 0.72 | 1.55 |
| 0.65 | 1.21 | 0.73 | 1.60 |
| 0.66 | 1.25 | 0.74 | 1.65 |
| 0.67 | 1.29 | 0.75 | 1.70 |
| 0.68 | 1.33 | 0.76 | 1.74 |
| 0.69 | 1.37 | 0.77 | 1.79 |
| 0.70 | 1.42 | 0.78 | 1.84 |
| 0.71 | 1.46 | 0.79 | 1.89 |
| 0.72 | 1.51 | 0.80 | 1.95 |
| 0.73 | 1.55 | 0.81 | 2.00 |
| 0.74 | 1.60 | 0.82 | 2.05 |
| 0.75 | 1.65 | 0.83 | 2.11 |
| 0.76 | 1.70 | 0.84 | 2.16 |
| 0.77 | 1.75 | 0.85 | 2.22 |
| 0.78 | 1.80 | 0.86 | 2.27 |
| 0.79 | 1.85 | 0.87 | 2.33 |
| 0.80 | 1.90 | 0.88 | 2.39 |
| 0.81 | 1.95 | 0.89 | 2.44 |
| 0.82 | 2.01 | 0.90 | 2.50 |
| 0.83 | 2.06 | 0.91 | 2.56 |
| 0.84 | 2.11 | 0.92 | 2.62 |
| 0.85 | 2.17 | 0.93 | 2.69 |
| 0.86 | 2.23 | 0.94 | 2.75 |
| 0.87 | 2.28 | 0.95 | 2.81 |
| 0.88 | 2.34 | 0.96 | 2.87 |
| 0.89 | 2.40 | 0.97 | 2.94 |
| 0.90 | 2.46 | 0.98 | 3.00 |
| 0.91 | 2.52 | 0.99 | 3.07 |
| 0.92 | 2.58 | 1.00 | 3.14 |
| 0.93 | 2.64 | 1.01 | 3.20 |
| 0.94 | 2.70 | 1.02 | 3.27 |
| 0.95 | 2.77 | 1.03 | 3.34 |
| 0.96 | 2.83 | 1.04 | 3.41 |

Table C-5. Rating Curves Used to Estimate Discharge at MONMS.

| MONMS Table 02 | | MONMS Table 03 | |
|---------------------|--------------------|---------------------|--------------------|
| Water Level (ft) | Discharge (cfs) | Water Level (ft) | Discharge (cfs) |
| 0.97 | 2.90 | 1.05 | 3.48 |
| 0.98 | 2.96 | 1.06 | 3.55 |
| 0.99 | 3.03 | 1.07 | 3.63 |
| 1.00 | 3.10 | 1.08 | 3.70 |
| 1.01 | 3.16 | 1.09 | 3.77 |
| 1.02 | 3.23 | 1.10 | 3.85 |
| 1.03 | 3.30 | 1.11 | 3.92 |
| 1.04 | 3.37 | 1.12 | 4.00 |
| 1.05 | 3.45 | 1.13 | 4.08 |
| 1.06 | 3.52 | 1.14 | 4.15 |
| 1.07 | 3.59 | 1.15 | 4.23 |
| 1.08 | 3.66 | 1.16 | 4.31 |
| 1.09 | 3.74 | 1.17 | 4.39 |
| 1.10 | 3.81 | 1.18 | 4.47 |
| 1.11 | 3.89 | 1.19 | 4.55 |
| 1.12 | 3.97 | 1.20 | 4.63 |
| 1.13 | 4.05 | 1.21 | 4.72 |
| 1.14 | 4.13 | 1.22 | 4.80 |
| 1.15 | 4.20 | 1.23 | 4.89 |
| 1.16 | 4.29 | 1.24 | 4.97 |
| 1.17 | 4.37 | 1.25 | 5.06 |
| 1.18 | 4.45 | 1.26 | 5.14 |
| 1.19 | 4.53 | 1.27 | 5.23 |
| 1.20 | 4.62 | 1.28 | 5.32 |
| 1.21 | 4.70 | 1.29 | 5.41 |
| 1.22 | 4.79 | 1.30 | 5.50 |
| 1.23 | 4.87 | | |
| 1.24 | 4.96 | | |
| 1.25 | 5.05 | | |
| 1.26 | 5.14 | | |
| 1.27 | 5.23 | | |
| 1.28 | 5.32 | | |
| 1.29 | 5.41 | | |
| 1.30 | 5.50 | | |

Table C-6. Rating Curves Used to Estimate Discharge at TOSMO.

| TOSMO Table 02 | |
|---------------------|--------------------|
| Water Level (ft) | Discharge (cfs) |
| 0.10 | 0.14 |
| 0.11 | 0.18 |
| 0.12 | 0.22 |
| 0.13 | 0.26 |
| 0.14 | 0.31 |
| 0.15 | 0.37 |
| 0.16 | 0.43 |
| 0.17 | 0.50 |
| 0.18 | 0.55 |
| 0.19 | 0.61 |
| 0.20 | 0.67 |
| 0.21 | 0.73 |
| 0.22 | 0.79 |
| 0.23 | 0.85 |
| 0.24 | 0.92 |
| 0.25 | 0.99 |
| 0.26 | 1.06 |
| 0.27 | 1.14 |
| 0.28 | 1.21 |
| 0.29 | 1.29 |
| 0.30 | 1.37 |
| 0.31 | 1.45 |
| 0.32 | 1.57 |
| 0.33 | 1.69 |
| 0.34 | 1.81 |
| 0.35 | 1.94 |
| 0.36 | 2.08 |
| 0.37 | 2.22 |
| 0.38 | 2.37 |
| 0.39 | 2.52 |
| 0.40 | 2.68 |
| 0.41 | 2.84 |
| 0.42 | 3.01 |
| 0.43 | 3.19 |
| 0.44 | 3.37 |
| 0.45 | 3.55 |
| 0.46 | 3.75 |
| 0.47 | 3.95 |
| 0.48 | 4.15 |
| 0.49 | 4.36 |
| 0.50 | 4.58 |
| 0.51 | 4.80 |
| 0.52 | 5.03 |
| 0.53 | 5.27 |
| 0.54 | 5.51 |
| 0.55 | 5.76 |
| 0.56 | 6.02 |
| 0.57 | 6.28 |

Table C-6. Rating Curves Used to Estimate Discharge at TOSMO.

| TOSMO Table 02 | |
|---------------------|--------------------|
| Water Level (ft) | Discharge (cfs) |
| 0.58 | 6.55 |
| 0.59 | 6.82 |
| 0.60 | 7.10 |
| 0.61 | 7.39 |
| 0.62 | 7.69 |
| 0.63 | 7.99 |
| 0.64 | 8.30 |
| 0.65 | 8.61 |
| 0.66 | 8.93 |
| 0.67 | 9.26 |
| 0.68 | 9.60 |
| 0.69 | 9.90 |
| 0.70 | 10.20 |
| 0.71 | 10.50 |
| 0.72 | 10.82 |
| 0.73 | 11.13 |
| 0.74 | 11.45 |
| 0.75 | 11.78 |
| 0.76 | 12.11 |
| 0.77 | 12.44 |
| 0.78 | 12.78 |
| 0.79 | 13.13 |
| 0.80 | 13.47 |
| 0.81 | 13.83 |
| 0.82 | 14.19 |
| 0.83 | 14.55 |
| 0.84 | 14.92 |
| 0.85 | 15.29 |
| 0.86 | 15.67 |
| 0.87 | 16.05 |
| 0.88 | 16.44 |
| 0.89 | 16.83 |
| 0.90 | 17.23 |
| 0.91 | 17.63 |
| 0.92 | 18.03 |
| 0.93 | 18.45 |
| 0.94 | 18.86 |
| 0.95 | 19.28 |
| 0.96 | 19.71 |
| 0.97 | 20.14 |
| 0.98 | 20.58 |
| 0.99 | 21.02 |
| 1.00 | 21.46 |
| 1.01 | 21.91 |
| 1.02 | 22.37 |
| 1.03 | 22.83 |
| 1.04 | 23.29 |
| 1.05 | 23.76 |

Table C-6. Rating Curves Used to Estimate Discharge at TOSMO.

| TOSMO Table 02 | |
|---------------------|--------------------|
| Water Level (ft) | Discharge (cfs) |
| 1.06 | 24.23 |
| 1.07 | 24.71 |
| 1.08 | 25.20 |
| 1.09 | 25.69 |
| 1.10 | 26.18 |
| 1.11 | 26.68 |
| 1.12 | 27.18 |
| 1.13 | 27.69 |
| 1.14 | 28.21 |
| 1.15 | 28.73 |
| 1.16 | 29.25 |
| 1.17 | 29.78 |
| 1.18 | 30.31 |
| 1.19 | 30.85 |
| 1.20 | 31.39 |
| 1.21 | 31.94 |
| 1.22 | 32.49 |
| 1.23 | 33.05 |
| 1.24 | 33.61 |
| 1.25 | 34.18 |
| 1.26 | 34.76 |
| 1.27 | 35.33 |
| 1.28 | 35.92 |
| 1.29 | 36.50 |
| 1.30 | 37.10 |
| 1.31 | 37.69 |
| 1.32 | 38.30 |
| 1.33 | 38.90 |
| 1.34 | 39.52 |
| 1.35 | 40.13 |
| 1.36 | 40.76 |
| 1.37 | 41.39 |
| 1.38 | 42.02 |
| 1.39 | 42.66 |
| 1.40 | 43.30 |
| 1.41 | 43.95 |
| 1.42 | 44.60 |
| 1.43 | 45.26 |
| 1.44 | 45.92 |
| 1.45 | 46.59 |
| 1.46 | 47.26 |
| 1.47 | 47.94 |
| 1.48 | 48.62 |
| 1.49 | 49.31 |
| 1.50 | 50.00 |

Table C-7. Rating Curves Used to Estimate Discharge at TOSMI.

| TOSMI Table 03 | | TOSMI Table 04 | |
|---------------------|--------------------|---------------------|--------------------|
| Water Level (ft) | Discharge (cfs) | Water Level (ft) | Discharge (cfs) |
| 0.01 | 0.00 | 0.08 | 0.06 |
| 0.02 | 0.00 | 0.09 | 0.08 |
| 0.03 | 0.00 | 0.10 | 0.10 |
| 0.04 | 0.00 | 0.11 | 0.12 |
| 0.05 | 0.03 | 0.12 | 0.15 |
| 0.06 | 0.03 | 0.13 | 0.18 |
| 0.07 | 0.04 | 0.14 | 0.21 |
| 0.08 | 0.04 | 0.15 | 0.24 |
| 0.09 | 0.04 | 0.16 | 0.28 |
| 0.10 | 0.04 | 0.17 | 0.32 |
| 0.11 | 0.05 | 0.18 | 0.36 |
| 0.12 | 0.05 | 0.19 | 0.40 |
| 0.13 | 0.05 | 0.20 | 0.45 |
| 0.14 | 0.06 | 0.21 | 0.50 |
| 0.15 | 0.07 | 0.22 | 0.56 |
| 0.16 | 0.11 | 0.23 | 0.61 |
| 0.17 | 0.15 | 0.24 | 0.67 |
| 0.18 | 0.22 | 0.25 | 0.73 |
| 0.19 | 0.31 | 0.26 | 0.80 |
| 0.20 | 0.36 | 0.27 | 0.89 |
| 0.21 | 0.42 | 0.28 | 0.99 |
| 0.22 | 0.48 | 0.29 | 1.10 |
| 0.23 | 0.54 | 0.30 | 1.21 |
| 0.24 | 0.62 | 0.31 | 1.33 |
| 0.25 | 0.70 | 0.32 | 1.46 |
| 0.26 | 0.78 | 0.33 | 1.60 |
| 0.27 | 0.87 | 0.34 | 1.74 |
| 0.28 | 0.97 | 0.35 | 1.90 |
| 0.29 | 1.08 | 0.36 | 2.06 |
| 0.30 | 1.19 | 0.37 | 2.23 |
| 0.31 | 1.31 | 0.38 | 2.41 |
| 0.32 | 1.44 | 0.39 | 2.60 |
| 0.33 | 1.57 | 0.40 | 2.80 |
| 0.34 | 1.72 | 0.41 | 3.01 |
| 0.35 | 1.87 | 0.42 | 3.22 |
| 0.36 | 2.03 | 0.43 | 3.45 |
| 0.37 | 2.20 | 0.44 | 3.69 |
| 0.38 | 2.38 | 0.45 | 3.94 |
| 0.39 | 2.57 | 0.46 | 4.20 |
| 0.40 | 2.77 | 0.47 | 4.47 |
| 0.41 | 2.98 | 0.48 | 4.75 |
| 0.42 | 3.20 | 0.49 | 5.05 |
| 0.43 | 3.43 | 0.50 | 5.35 |
| 0.44 | 3.67 | 0.51 | 5.67 |
| 0.45 | 3.92 | 0.52 | 6.00 |
| 0.46 | 4.18 | 0.53 | 6.20 |
| 0.47 | 4.46 | 0.54 | 6.41 |
| 0.48 | 4.74 | 0.55 | 6.62 |

Table C-7. Rating Curves Used to Estimate Discharge at TOSMI.

| TOSMI Table 03 | | TOSMI Table 04 | |
|---------------------|--------------------|---------------------|--------------------|
| Water Level (ft) | Discharge (cfs) | Water Level (ft) | Discharge (cfs) |
| 0.49 | 5.04 | 0.56 | 6.83 |
| 0.50 | 5.35 | 0.57 | 7.05 |
| 0.51 | 5.67 | 0.58 | 7.27 |
| 0.52 | 6.00 | 0.59 | 7.49 |
| 0.53 | 6.20 | 0.60 | 7.71 |
| 0.54 | 6.41 | 0.61 | 7.94 |
| 0.55 | 6.62 | 0.62 | 8.17 |
| 0.56 | 6.83 | 0.63 | 8.40 |
| 0.57 | 7.05 | 0.64 | 8.64 |
| 0.58 | 7.27 | 0.65 | 8.88 |
| 0.59 | 7.49 | 0.66 | 9.12 |
| 0.60 | 7.71 | 0.67 | 9.36 |
| 0.61 | 7.94 | 0.68 | 9.61 |
| 0.62 | 8.17 | 0.69 | 9.86 |
| 0.63 | 8.40 | 0.70 | 10.11 |
| 0.64 | 8.64 | 0.71 | 10.37 |
| 0.65 | 8.88 | 0.72 | 10.63 |
| 0.66 | 9.12 | 0.73 | 10.89 |
| 0.67 | 9.36 | 0.74 | 11.15 |
| 0.68 | 9.61 | 0.75 | 11.42 |
| 0.69 | 9.86 | 0.76 | 11.69 |
| 0.70 | 10.11 | 0.77 | 11.96 |
| 0.71 | 10.37 | 0.78 | 12.23 |
| 0.72 | 10.63 | 0.79 | 12.51 |
| 0.73 | 10.89 | 0.80 | 12.79 |
| 0.74 | 11.15 | 0.81 | 13.07 |
| 0.75 | 11.42 | 0.82 | 13.35 |
| 0.76 | 11.69 | 0.83 | 13.64 |
| 0.77 | 11.96 | 0.84 | 13.93 |
| 0.78 | 12.23 | 0.85 | 14.22 |
| 0.79 | 12.51 | 0.86 | 14.52 |
| 0.80 | 12.79 | 0.87 | 14.82 |
| 0.81 | 13.07 | 0.88 | 15.12 |
| 0.82 | 13.35 | 0.89 | 15.42 |
| 0.83 | 13.64 | 0.90 | 15.73 |
| 0.84 | 13.93 | 0.91 | 16.03 |
| 0.85 | 14.22 | 0.92 | 16.34 |
| 0.86 | 14.52 | 0.93 | 16.66 |
| 0.87 | 14.82 | 0.94 | 16.97 |
| 0.88 | 15.12 | 0.95 | 17.29 |
| 0.89 | 15.42 | 0.96 | 17.61 |
| 0.90 | 15.73 | 0.97 | 17.94 |
| 0.91 | 16.03 | 0.98 | 18.26 |
| 0.92 | 16.34 | 0.99 | 18.59 |
| 0.93 | 16.66 | 1.00 | 18.92 |
| 0.94 | 16.97 | 1.01 | 19.26 |
| 0.95 | 17.29 | 1.02 | 19.59 |
| 0.96 | 17.61 | 1.03 | 19.93 |

Table C-7. Rating Curves Used to Estimate Discharge at TOSMI.

| TOSMI Table 03 | | TOSMI Table 04 | |
|---------------------|--------------------|---------------------|--------------------|
| Water Level (ft) | Discharge (cfs) | Water Level (ft) | Discharge (cfs) |
| 0.97 | 17.94 | 1.04 | 20.27 |
| 0.98 | 18.26 | 1.05 | 20.62 |
| 0.99 | 18.59 | 1.06 | 20.96 |
| 1.00 | 18.92 | 1.07 | 21.31 |
| 1.01 | 19.26 | 1.08 | 21.66 |
| 1.02 | 19.59 | 1.09 | 22.02 |
| 1.03 | 19.93 | 1.10 | 22.37 |
| 1.04 | 20.27 | 1.11 | 22.73 |
| 1.05 | 20.62 | 1.12 | 23.09 |
| 1.06 | 20.96 | 1.13 | 23.45 |
| 1.07 | 21.31 | 1.14 | 23.82 |
| 1.08 | 21.66 | 1.15 | 24.19 |
| 1.09 | 22.02 | 1.16 | 24.56 |
| 1.10 | 22.37 | 1.17 | 24.93 |
| 1.11 | 22.73 | 1.18 | 25.31 |
| 1.12 | 23.09 | 1.19 | 25.68 |
| 1.13 | 23.45 | 1.20 | 26.07 |
| 1.14 | 23.82 | 1.21 | 26.45 |
| 1.15 | 24.19 | 1.22 | 26.83 |
| 1.16 | 24.56 | 1.23 | 27.22 |
| 1.17 | 24.93 | 1.24 | 27.61 |
| 1.18 | 25.31 | 1.25 | 28.00 |
| 1.19 | 25.68 | 1.26 | 28.40 |
| 1.20 | 26.07 | 1.27 | 28.79 |
| 1.21 | 26.45 | 1.28 | 29.19 |
| 1.22 | 26.83 | 1.29 | 29.60 |
| 1.23 | 27.22 | 1.30 | 30.00 |
| 1.24 | 27.61 | | |
| 1.25 | 28.00 | | |
| 1.26 | 28.40 | | |
| 1.27 | 28.79 | | |
| 1.28 | 29.19 | | |
| 1.29 | 29.60 | | |
| 1.30 | 30.00 | | |

Table C-8. Rating Curves Used to Estimate Discharge at COLM.

| COLM Table 03 | | COLM Table 04 | |
|---------------------|--------------------|---------------------|--------------------|
| Water Level (ft) | Discharge (cfs) | Water Level (ft) | Discharge (cfs) |
| 0.01 | 0.00 | 0.37 | 0.00 |
| 0.02 | 0.00 | 0.38 | 0.00 |
| 0.03 | 0.00 | 0.39 | 0.00 |
| 0.04 | 0.00 | 0.40 | 0.01 |
| 0.05 | 0.00 | 0.41 | 0.01 |
| 0.06 | 0.00 | 0.42 | 0.02 |
| 0.07 | 0.00 | 0.43 | 0.02 |
| 0.08 | 0.00 | 0.44 | 0.07 |
| 0.09 | 0.00 | 0.45 | 0.22 |
| 0.10 | 0.00 | 0.46 | 0.24 |
| 0.11 | 0.00 | 0.47 | 0.26 |
| 0.12 | 0.00 | 0.48 | 0.28 |
| 0.13 | 0.00 | 0.49 | 0.30 |
| 0.14 | 0.00 | 0.50 | 0.33 |
| 0.15 | 0.00 | 0.51 | 0.35 |
| 0.16 | 0.00 | 0.52 | 0.38 |
| 0.17 | 0.00 | 0.53 | 0.41 |
| 0.18 | 0.00 | 0.54 | 0.44 |
| 0.19 | 0.00 | 0.55 | 0.47 |
| 0.20 | 0.00 | 0.56 | 0.50 |
| 0.21 | 0.00 | 0.57 | 0.54 |
| 0.22 | 0.00 | 0.58 | 0.57 |
| 0.23 | 0.00 | 0.59 | 0.61 |
| 0.24 | 0.00 | 0.60 | 0.65 |
| 0.25 | 0.00 | 0.61 | 0.69 |
| 0.26 | 0.00 | 0.62 | 0.74 |
| 0.27 | 0.00 | 0.63 | 0.78 |
| 0.28 | 0.00 | 0.64 | 0.83 |
| 0.29 | 0.00 | 0.65 | 0.88 |
| 0.30 | 0.01 | 0.66 | 0.94 |
| 0.31 | 0.01 | 0.67 | 0.99 |
| 0.32 | 0.02 | 0.68 | 1.05 |
| 0.33 | 0.03 | 0.69 | 1.11 |
| 0.34 | 0.04 | 0.70 | 1.18 |
| 0.35 | 0.05 | 0.71 | 1.25 |
| 0.36 | 0.07 | 0.72 | 1.32 |
| 0.37 | 0.10 | 0.73 | 1.39 |
| 0.38 | 0.11 | 0.74 | 1.46 |
| 0.39 | 0.12 | 0.75 | 1.54 |
| 0.40 | 0.14 | 0.76 | 1.63 |
| 0.41 | 0.15 | 0.77 | 1.71 |
| 0.42 | 0.16 | 0.78 | 1.80 |
| 0.43 | 0.18 | 0.79 | 1.89 |
| 0.44 | 0.20 | 0.80 | 1.99 |
| 0.45 | 0.21 | 0.81 | 2.09 |
| 0.46 | 0.23 | 0.82 | 2.19 |
| 0.47 | 0.25 | 0.83 | 2.29 |
| 0.48 | 0.27 | 0.84 | 2.40 |

Table C-8. Rating Curves Used to Estimate Discharge at COLM.

| COLM Table 03 | | COLM Table 04 | |
|---------------------|--------------------|---------------------|--------------------|
| Water Level (ft) | Discharge (cfs) | Water Level (ft) | Discharge (cfs) |
| 0.49 | 0.30 | 0.85 | 2.52 |
| 0.50 | 0.32 | 0.86 | 2.64 |
| 0.51 | 0.35 | 0.87 | 2.76 |
| 0.52 | 0.37 | 0.88 | 2.88 |
| 0.53 | 0.40 | 0.89 | 3.02 |
| 0.54 | 0.43 | 0.90 | 3.15 |
| 0.55 | 0.46 | 0.91 | 3.31 |
| 0.56 | 0.50 | 0.92 | 3.47 |
| 0.57 | 0.53 | 0.93 | 3.64 |
| 0.58 | 0.57 | 0.94 | 3.81 |
| 0.59 | 0.61 | 0.95 | 3.99 |
| 0.60 | 0.65 | 0.96 | 4.18 |
| 0.61 | 0.69 | 0.97 | 4.37 |
| 0.62 | 0.73 | 0.98 | 4.58 |
| 0.63 | 0.78 | 0.99 | 4.78 |
| 0.64 | 0.83 | 1.00 | 5.00 |
| 0.65 | 0.88 | 1.01 | 5.17 |
| 0.66 | 0.94 | 1.02 | 5.35 |
| 0.67 | 0.99 | 1.03 | 5.53 |
| 0.68 | 1.05 | 1.04 | 5.72 |
| 0.69 | 1.11 | 1.05 | 5.91 |
| 0.70 | 1.18 | 1.06 | 6.10 |
| 0.71 | 1.25 | 1.07 | 6.30 |
| 0.72 | 1.32 | 1.08 | 6.50 |
| 0.73 | 1.39 | 1.09 | 6.71 |
| 0.74 | 1.46 | 1.10 | 6.93 |
| 0.75 | 1.54 | 1.11 | 7.14 |
| 0.76 | 1.63 | 1.12 | 7.37 |
| 0.77 | 1.71 | 1.13 | 7.59 |
| 0.78 | 1.80 | 1.14 | 7.83 |
| 0.79 | 1.89 | 1.15 | 8.06 |
| 0.80 | 1.99 | 1.16 | 8.31 |
| 0.81 | 2.09 | 1.17 | 8.55 |
| 0.82 | 2.19 | 1.18 | 8.81 |
| 0.83 | 2.29 | 1.19 | 9.06 |
| 0.84 | 2.40 | 1.20 | 9.33 |
| 0.85 | 2.52 | 1.21 | 9.59 |
| 0.86 | 2.64 | 1.22 | 9.87 |
| 0.87 | 2.76 | 1.23 | 10.15 |
| 0.88 | 2.88 | 1.24 | 10.43 |
| 0.89 | 3.02 | 1.25 | 10.72 |
| 0.90 | 3.15 | 1.26 | 11.02 |
| 0.91 | 3.31 | 1.27 | 11.32 |
| 0.92 | 3.47 | 1.28 | 11.63 |
| 0.93 | 3.64 | 1.29 | 11.94 |
| 0.94 | 3.81 | 1.30 | 12.26 |
| 0.95 | 3.99 | 1.31 | 12.59 |
| 0.96 | 4.18 | 1.32 | 12.92 |

Table C-8. Rating Curves Used to Estimate Discharge at COLM.

| COLM Table 03 | | COLM Table 04 | |
|---------------------|--------------------|---------------------|--------------------|
| Water Level (ft) | Discharge (cfs) | Water Level (ft) | Discharge (cfs) |
| 0.97 | 4.37 | 1.33 | 13.26 |
| 0.98 | 4.58 | 1.34 | 13.60 |
| 0.99 | 4.78 | 1.35 | 13.95 |
| 1.00 | 5.00 | 1.36 | 14.31 |
| 1.01 | 5.18 | 1.37 | 14.67 |
| 1.02 | 5.35 | 1.38 | 15.04 |
| 1.03 | 5.54 | 1.39 | 15.41 |
| 1.04 | 5.73 | 1.40 | 15.80 |
| 1.05 | 5.92 | 1.41 | 16.19 |
| 1.06 | 6.12 | 1.42 | 16.58 |
| 1.07 | 6.32 | 1.43 | 16.99 |
| 1.08 | 6.53 | 1.44 | 17.39 |
| 1.09 | 6.74 | 1.45 | 17.81 |
| 1.10 | 6.95 | 1.46 | 18.23 |
| 1.11 | 7.17 | 1.47 | 18.67 |
| 1.12 | 7.40 | 1.48 | 19.10 |
| 1.13 | 7.63 | 1.49 | 19.55 |
| 1.14 | 7.87 | 1.50 | 20.00 |
| 1.15 | 8.11 | | |
| 1.16 | 8.36 | | |
| 1.17 | 8.61 | | |
| 1.18 | 8.86 | | |
| 1.19 | 9.13 | | |
| 1.20 | 9.39 | | |
| 1.21 | 9.67 | | |
| 1.22 | 9.95 | | |
| 1.23 | 10.23 | | |
| 1.24 | 10.52 | | |
| 1.25 | 10.82 | | |
| 1.26 | 11.12 | | |
| 1.27 | 11.43 | | |
| 1.28 | 11.75 | | |
| 1.29 | 12.07 | | |
| 1.30 | 12.39 | | |
| 1.31 | 12.73 | | |
| 1.32 | 13.06 | | |
| 1.33 | 13.41 | | |
| 1.34 | 13.76 | | |
| 1.35 | 14.12 | | |
| 1.36 | 14.49 | | |
| 1.37 | 14.86 | | |
| 1.38 | 15.24 | | |
| 1.39 | 15.62 | | |
| 1.40 | 16.01 | | |
| 1.41 | 16.41 | | |
| 1.42 | 16.82 | | |
| 1.43 | 17.23 | | |
| 1.44 | 17.65 | | |

Table C-8. Rating Curves Used to Estimate Discharge at COLM.

| COLM Table 03 | | COLM Table 04 | |
|---------------------|--------------------|---------------------|--------------------|
| Water Level (ft) | Discharge (cfs) | Water Level (ft) | Discharge (cfs) |
| 1.45 | 18.08 | | |
| 1.46 | 18.52 | | |
| 1.47 | 18.96 | | |
| 1.48 | 19.41 | | |
| 1.49 | 19.87 | | |
| 1.50 | 20.33 | | |
| 1.51 | 20.80 | | |
| 1.52 | 21.28 | | |
| 1.53 | 21.77 | | |
| 1.54 | 22.27 | | |
| 1.55 | 22.77 | | |
| 1.56 | 23.28 | | |
| 1.57 | 23.81 | | |
| 1.58 | 24.33 | | |
| 1.59 | 24.87 | | |
| 1.60 | 25.42 | | |
| 1.61 | 25.97 | | |
| 1.62 | 26.53 | | |
| 1.63 | 27.10 | | |
| 1.64 | 27.68 | | |
| 1.65 | 28.27 | | |
| 1.66 | 28.87 | | |
| 1.67 | 29.47 | | |
| 1.68 | 30.09 | | |
| 1.69 | 30.71 | | |
| 1.70 | 31.35 | | |
| 1.71 | 31.99 | | |
| 1.72 | 32.64 | | |
| 1.73 | 33.30 | | |
| 1.74 | 33.97 | | |
| 1.75 | 34.65 | | |
| 1.76 | 35.34 | | |
| 1.77 | 36.04 | | |
| 1.78 | 36.75 | | |
| 1.79 | 37.47 | | |
| 1.80 | 38.20 | | |
| 1.81 | 38.94 | | |
| 1.82 | 39.69 | | |
| 1.83 | 40.45 | | |
| 1.84 | 41.22 | | |
| 1.85 | 42.00 | | |
| 1.86 | 42.79 | | |
| 1.87 | 43.59 | | |
| 1.88 | 44.40 | | |
| 1.89 | 45.22 | | |
| 1.90 | 46.06 | | |

Table C-8. Rating Curves Used to Estimate Discharge at COLM.

| COLM Table 03 | | COLM Table 04 | |
|---------------------|--------------------|---------------------|--------------------|
| Water Level (ft) | Discharge (cfs) | Water Level (ft) | Discharge (cfs) |
| 1.91 | 46.90 | | |
| 1.92 | 47.76 | | |
| 1.93 | 48.62 | | |
| 1.94 | 49.50 | | |
| 1.95 | 50.39 | | |
| 1.96 | 51.29 | | |
| 1.97 | 52.20 | | |
| 1.98 | 53.12 | | |
| 1.99 | 54.05 | | |
| 2.00 | 55.00 | | |

Table C-9. Rating Curves Used to Estimate Discharge at SEIMN.

| SEIMN Table 06 | | SEIMN Table 07 | |
|---------------------|--------------------|---------------------|--------------------|
| Water Level (ft) | Discharge (cfs) | Water Level (ft) | Discharge (cfs) |
| 0.15 | 0.05 | 0.10 | 0.01 |
| 0.16 | 0.07 | 0.11 | 0.02 |
| 0.17 | 0.09 | 0.12 | 0.02 |
| 0.18 | 0.12 | 0.13 | 0.03 |
| 0.19 | 0.15 | 0.14 | 0.04 |
| 0.20 | 0.20 | 0.15 | 0.06 |
| 0.21 | 0.25 | 0.16 | 0.08 |
| 0.22 | 0.31 | 0.17 | 0.10 |
| 0.23 | 0.38 | 0.18 | 0.13 |
| 0.24 | 0.47 | 0.19 | 0.16 |
| 0.25 | 0.56 | 0.20 | 0.20 |
| 0.26 | 0.68 | 0.21 | 0.24 |
| 0.27 | 0.74 | 0.22 | 0.29 |
| 0.28 | 0.80 | 0.23 | 0.35 |
| 0.29 | 0.87 | 0.24 | 0.42 |
| 0.30 | 0.93 | 0.25 | 0.49 |
| 0.31 | 1.00 | 0.26 | 0.53 |
| 0.32 | 1.08 | 0.27 | 0.58 |
| 0.33 | 1.15 | 0.28 | 0.63 |
| 0.34 | 1.23 | 0.29 | 0.68 |
| 0.35 | 1.31 | 0.30 | 0.73 |
| 0.36 | 1.40 | 0.31 | 0.79 |
| 0.37 | 1.49 | 0.32 | 0.85 |
| 0.38 | 1.58 | 0.33 | 0.91 |
| 0.39 | 1.67 | 0.34 | 0.97 |
| 0.40 | 1.77 | 0.35 | 1.03 |
| 0.41 | 1.87 | 0.36 | 1.10 |
| 0.42 | 1.97 | 0.37 | 1.17 |
| 0.43 | 2.07 | 0.38 | 1.24 |
| 0.44 | 2.18 | 0.39 | 1.31 |
| 0.45 | 2.29 | 0.40 | 1.39 |
| 0.46 | 2.41 | 0.41 | 1.46 |
| 0.47 | 2.52 | 0.42 | 1.54 |
| 0.48 | 2.64 | 0.43 | 1.63 |
| 0.49 | 2.77 | 0.44 | 1.71 |
| 0.50 | 2.89 | 0.45 | 1.80 |
| 0.51 | 3.02 | 0.46 | 1.89 |
| 0.52 | 3.16 | 0.47 | 1.98 |
| 0.53 | 3.29 | 0.48 | 2.07 |
| 0.54 | 3.43 | 0.49 | 2.17 |
| 0.55 | 3.58 | 0.50 | 2.27 |
| 0.56 | 3.72 | 0.51 | 2.37 |
| 0.57 | 3.87 | 0.52 | 2.47 |
| 0.58 | 4.02 | 0.53 | 2.58 |
| 0.59 | 4.18 | 0.54 | 2.69 |
| 0.60 | 4.34 | 0.55 | 2.80 |
| 0.61 | 4.50 | 0.56 | 2.91 |
| 0.62 | 4.66 | 0.57 | 3.03 |

Table C-9. Rating Curves Used to Estimate Discharge at SEIMN.

| SEIMN Table 06 | | SEIMN Table 07 | |
|---------------------|--------------------|---------------------|--------------------|
| Water Level (ft) | Discharge (cfs) | Water Level (ft) | Discharge (cfs) |
| 0.63 | 4.83 | 0.58 | 3.15 |
| 0.64 | 5.00 | 0.59 | 3.27 |
| 0.65 | 5.18 | 0.60 | 3.39 |
| 0.66 | 5.35 | 0.61 | 3.52 |
| 0.67 | 5.54 | 0.62 | 3.65 |
| 0.68 | 5.72 | 0.63 | 3.78 |
| 0.69 | 5.91 | 0.64 | 3.91 |
| 0.70 | 6.10 | 0.65 | 4.05 |
| 0.71 | 6.29 | 0.66 | 4.19 |
| 0.72 | 6.49 | 0.67 | 4.33 |
| 0.73 | 6.69 | 0.68 | 4.48 |
| 0.74 | 6.90 | 0.69 | 4.62 |
| 0.75 | 7.11 | 0.70 | 4.77 |
| 0.76 | 7.32 | 0.71 | 4.92 |
| 0.77 | 7.53 | 0.72 | 5.08 |
| 0.78 | 7.75 | 0.73 | 5.24 |
| 0.79 | 7.97 | 0.74 | 5.40 |
| 0.80 | 8.20 | 0.75 | 5.56 |
| | | 0.76 | 5.72 |
| | | 0.77 | 5.89 |
| | | 0.78 | 6.06 |
| | | 0.79 | 6.24 |
| | | 0.80 | 6.41 |
| | | 0.81 | 6.59 |
| | | 0.82 | 6.77 |
| | | 0.83 | 6.95 |
| | | 0.84 | 7.14 |
| | | 0.85 | 7.33 |
| | | 0.86 | 7.52 |
| | | 0.87 | 7.72 |
| | | 0.88 | 7.92 |
| | | 0.89 | 8.12 |
| | | 0.90 | 8.32 |
| | | 0.91 | 8.52 |
| | | 0.92 | 8.73 |
| | | 0.93 | 8.94 |
| | | 0.94 | 9.16 |
| | | 0.95 | 9.37 |
| | | 0.96 | 9.59 |
| | | 0.97 | 9.82 |
| | | 0.98 | 10.04 |
| | | 0.99 | 10.27 |
| | | 1.00 | 10.50 |
| | | 1.01 | 10.74 |
| | | 1.02 | 10.98 |
| | | 1.03 | 11.22 |
| | | 1.04 | 11.46 |
| | | 1.05 | 11.71 |

Table C-9. Rating Curves Used to Estimate Discharge at SEIMN.

| SEIMN Table 06 | | SEIMN Table 07 | |
|---------------------|--------------------|---------------------|--------------------|
| Water Level (ft) | Discharge (cfs) | Water Level (ft) | Discharge (cfs) |
| | | 1.06 | 11.96 |
| | | 1.07 | 12.22 |
| | | 1.08 | 12.48 |
| | | 1.09 | 12.74 |
| | | 1.10 | 13.00 |

Table C-11. Rating Curves Used to Estimate Discharge at COUMO.

| COUMO Table 04 | | COUMO Table 05 | |
|---------------------|--------------------|---------------------|--------------------|
| Water Level (ft) | Discharge (cfs) | Water Level (ft) | Discharge (cfs) |
| 0.16 | 0.04 | 0.18 | 0.06 |
| 0.17 | 0.06 | 0.19 | 0.08 |
| 0.18 | 0.09 | 0.20 | 0.09 |
| 0.19 | 0.13 | 0.21 | 0.12 |
| 0.20 | 0.19 | 0.22 | 0.14 |
| 0.21 | 0.27 | 0.23 | 0.17 |
| 0.22 | 0.37 | 0.24 | 0.20 |
| 0.23 | 0.51 | 0.25 | 0.24 |
| 0.24 | 0.68 | 0.26 | 0.29 |
| 0.25 | 0.75 | 0.27 | 0.33 |
| 0.26 | 0.82 | 0.28 | 0.39 |
| 0.27 | 0.89 | 0.29 | 0.45 |
| 0.28 | 0.97 | 0.30 | 0.52 |
| 0.29 | 1.05 | 0.31 | 0.60 |
| 0.30 | 1.13 | 0.32 | 0.69 |
| 0.31 | 1.22 | 0.33 | 0.78 |
| 0.32 | 1.31 | 0.34 | 0.89 |
| 0.33 | 1.41 | 0.35 | 0.97 |
| 0.34 | 1.51 | 0.36 | 1.05 |
| 0.35 | 1.61 | 0.37 | 1.14 |
| 0.36 | 1.72 | 0.38 | 1.24 |
| 0.37 | 1.83 | 0.39 | 1.34 |
| 0.38 | 1.94 | 0.40 | 1.44 |
| 0.39 | 2.06 | 0.41 | 1.55 |
| 0.40 | 2.18 | 0.42 | 1.66 |
| 0.41 | 2.31 | 0.43 | 1.78 |
| 0.42 | 2.44 | 0.44 | 1.91 |
| 0.43 | 2.57 | 0.45 | 2.04 |
| 0.44 | 2.71 | 0.46 | 2.18 |
| 0.45 | 2.85 | 0.47 | 2.32 |
| 0.46 | 3.00 | 0.48 | 2.47 |
| 0.47 | 3.15 | 0.49 | 2.63 |
| 0.48 | 3.31 | 0.50 | 2.79 |
| 0.49 | 3.47 | 0.51 | 2.96 |
| 0.50 | 3.63 | 0.52 | 3.13 |
| 0.51 | 3.80 | 0.53 | 3.31 |
| 0.52 | 3.97 | 0.54 | 3.50 |
| 0.53 | 4.15 | 0.55 | 3.70 |
| 0.54 | 4.33 | 0.56 | 3.90 |
| 0.55 | 4.51 | 0.57 | 4.11 |
| 0.56 | 4.70 | 0.58 | 4.33 |
| 0.57 | 4.89 | 0.59 | 4.55 |
| 0.58 | 5.09 | 0.60 | 4.78 |
| 0.59 | 5.29 | 0.61 | 5.02 |
| 0.60 | 5.50 | 0.62 | 5.27 |
| 0.61 | 5.71 | 0.63 | 5.53 |
| 0.62 | 5.93 | 0.64 | 5.79 |
| 0.63 | 6.15 | 0.65 | 6.06 |

Table C-11. Rating Curves Used to Estimate Discharge at COUMO.

| COUMO Table 04 | | COUMO Table 05 | |
|---------------------|--------------------|---------------------|--------------------|
| Water Level (ft) | Discharge (cfs) | Water Level (ft) | Discharge (cfs) |
| 0.64 | 6.37 | 0.66 | 6.34 |
| 0.65 | 6.60 | 0.67 | 6.63 |
| 0.66 | 6.84 | 0.68 | 6.93 |
| 0.67 | 7.08 | 0.69 | 7.23 |
| 0.68 | 7.32 | 0.70 | 7.55 |
| 0.69 | 7.57 | 0.71 | 7.87 |
| 0.70 | 7.82 | 0.72 | 8.21 |
| 0.71 | 8.08 | 0.73 | 8.55 |
| 0.72 | 8.34 | 0.74 | 8.90 |
| 0.73 | 8.61 | 0.75 | 9.18 |
| 0.74 | 8.88 | 0.76 | 9.46 |
| 0.75 | 9.15 | 0.77 | 9.74 |
| 0.76 | 9.43 | 0.78 | 10.03 |
| 0.77 | 9.72 | 0.79 | 10.33 |
| 0.78 | 10.01 | 0.80 | 10.63 |
| 0.79 | 10.31 | 0.81 | 10.93 |
| 0.80 | 10.61 | 0.82 | 11.24 |
| 0.81 | 10.91 | 0.83 | 11.56 |
| 0.82 | 11.22 | 0.84 | 11.88 |
| 0.83 | 11.54 | 0.85 | 12.20 |
| 0.84 | 11.86 | 0.86 | 12.53 |
| 0.85 | 12.18 | 0.87 | 12.87 |
| 0.86 | 12.51 | 0.88 | 13.21 |
| 0.87 | 12.84 | 0.89 | 13.55 |
| 0.88 | 13.18 | 0.90 | 13.90 |
| 0.89 | 13.53 | 0.91 | 14.25 |
| 0.90 | 13.88 | 0.92 | 14.61 |
| 0.91 | 14.23 | 0.93 | 14.98 |
| 0.92 | 14.59 | 0.94 | 15.35 |
| 0.93 | 14.95 | 0.95 | 15.72 |
| 0.94 | 15.32 | 0.96 | 16.10 |
| 0.95 | 15.70 | 0.97 | 16.49 |
| 0.96 | 16.08 | 0.98 | 16.87 |
| 0.97 | 16.46 | 0.99 | 17.27 |
| 0.98 | 16.85 | 1.00 | 17.67 |
| 0.99 | 17.25 | 1.01 | 18.07 |
| 1.00 | 17.65 | 1.02 | 18.48 |
| 1.01 | 18.05 | 1.03 | 18.90 |
| 1.02 | 18.46 | 1.04 | 19.32 |
| 1.03 | 18.88 | 1.05 | 19.75 |
| 1.04 | 19.30 | 1.06 | 20.18 |
| 1.05 | 19.73 | 1.07 | 20.61 |
| 1.06 | 20.16 | 1.08 | 21.05 |
| 1.07 | 20.59 | 1.09 | 21.50 |
| 1.08 | 21.04 | 1.10 | 21.95 |
| 1.09 | 21.48 | 1.11 | 22.41 |
| 1.10 | 21.93 | 1.12 | 22.87 |
| 1.11 | 22.39 | 1.13 | 23.34 |

Table C-11. Rating Curves Used to Estimate Discharge at COUMO.

| COUMO Table 04 | | COUMO Table 05 | |
|---------------------|--------------------|---------------------|--------------------|
| Water Level (ft) | Discharge (cfs) | Water Level (ft) | Discharge (cfs) |
| 1.12 | 22.86 | 1.14 | 23.81 |
| 1.13 | 23.32 | 1.15 | 24.29 |
| 1.14 | 23.80 | 1.16 | 24.78 |
| 1.15 | 24.28 | 1.17 | 25.27 |
| 1.16 | 24.76 | 1.18 | 25.76 |
| 1.17 | 25.25 | 1.19 | 26.26 |
| 1.18 | 25.75 | 1.20 | 26.76 |
| 1.19 | 26.25 | 1.21 | 27.28 |
| 1.20 | 26.75 | 1.22 | 27.79 |
| 1.21 | 27.26 | 1.23 | 28.31 |
| 1.22 | 27.78 | 1.24 | 28.84 |
| 1.23 | 28.30 | 1.25 | 29.37 |
| 1.24 | 28.83 | 1.26 | 29.91 |
| 1.25 | 29.36 | 1.27 | 30.45 |
| 1.26 | 29.90 | 1.28 | 31.00 |
| 1.27 | 30.45 | 1.29 | 31.56 |
| 1.28 | 31.00 | 1.30 | 32.12 |
| 1.29 | 31.55 | 1.31 | 32.68 |
| 1.30 | 32.11 | 1.32 | 33.25 |
| 1.31 | 32.68 | 1.33 | 33.83 |
| 1.32 | 33.25 | 1.34 | 34.41 |
| 1.33 | 33.83 | 1.35 | 35.00 |
| 1.34 | 34.41 | | |
| 1.35 | 35.00 | | |

Table C-12. Rating Curves Used to Estimate Discharge at COUMI.

| COUMI Table 02 | | COUMI Table 04 | | COUMI Table 05 | | COUMI Table 06 | | COUMI Table 07 | |
|---------------------|--------------------|---------------------|--------------------|---------------------|--------------------|---------------------|--------------------|---------------------|--------------------|
| Water Level (ft) | Discharge (cfs) | Water Level (ft) | Discharge (cfs) | Water Level (ft) | Discharge (cfs) | Water Level (ft) | Discharge (cfs) | Water Level (ft) | Discharge (cfs) |
| 0.01 | 0.02 | 0.04 | 0.02 | 0.01 | 0.02 | 0.09 | 0.01 | 0.12 | 0.01 |
| 0.02 | 0.03 | 0.05 | 0.03 | 0.02 | 0.03 | 0.10 | 0.02 | 0.13 | 0.01 |
| 0.03 | 0.04 | 0.06 | 0.05 | 0.03 | 0.04 | 0.11 | 0.03 | 0.14 | 0.02 |
| 0.04 | 0.05 | 0.07 | 0.06 | 0.04 | 0.05 | 0.12 | 0.04 | 0.15 | 0.03 |
| 0.05 | 0.05 | 0.08 | 0.09 | 0.05 | 0.07 | 0.13 | 0.05 | 0.16 | 0.04 |
| 0.06 | 0.06 | 0.09 | 0.11 | 0.06 | 0.08 | 0.14 | 0.05 | 0.17 | 0.04 |
| 0.07 | 0.07 | 0.10 | 0.14 | 0.07 | 0.09 | 0.15 | 0.07 | 0.18 | 0.05 |
| 0.08 | 0.09 | 0.11 | 0.17 | 0.08 | 0.10 | 0.16 | 0.08 | 0.19 | 0.06 |
| 0.09 | 0.11 | 0.12 | 0.20 | 0.09 | 0.11 | 0.17 | 0.09 | 0.20 | 0.08 |
| 0.10 | 0.12 | 0.13 | 0.23 | 0.10 | 0.14 | 0.18 | 0.10 | 0.21 | 0.09 |
| 0.11 | 0.14 | 0.14 | 0.27 | 0.11 | 0.17 | 0.19 | 0.12 | 0.22 | 0.10 |
| 0.12 | 0.16 | 0.15 | 0.32 | 0.12 | 0.20 | 0.20 | 0.13 | 0.23 | 0.12 |
| 0.13 | 0.18 | 0.16 | 0.36 | 0.13 | 0.24 | 0.21 | 0.15 | 0.24 | 0.13 |
| 0.14 | 0.20 | 0.17 | 0.41 | 0.14 | 0.28 | 0.22 | 0.17 | 0.25 | 0.15 |
| 0.15 | 0.22 | 0.18 | 0.46 | 0.15 | 0.32 | 0.23 | 0.19 | 0.26 | 0.17 |
| 0.16 | 0.24 | 0.19 | 0.52 | 0.16 | 0.36 | 0.24 | 0.21 | 0.27 | 0.20 |
| 0.17 | 0.26 | 0.20 | 0.58 | 0.17 | 0.41 | 0.25 | 0.24 | 0.28 | 0.22 |
| 0.18 | 0.28 | 0.21 | 0.64 | 0.18 | 0.46 | 0.26 | 0.26 | 0.29 | 0.25 |
| 0.19 | 0.30 | 0.22 | 0.72 | 0.19 | 0.52 | 0.27 | 0.29 | 0.30 | 0.27 |
| 0.20 | 0.35 | 0.23 | 0.81 | 0.20 | 0.58 | 0.28 | 0.31 | 0.31 | 0.30 |
| 0.21 | 0.41 | 0.24 | 0.91 | 0.21 | 0.64 | 0.29 | 0.34 | 0.32 | 0.34 |
| 0.22 | 0.47 | 0.25 | 1.01 | 0.22 | 0.72 | 0.30 | 0.37 | 0.33 | 0.37 |
| 0.23 | 0.54 | 0.26 | 1.12 | 0.23 | 0.81 | 0.31 | 0.40 | 0.34 | 0.41 |
| 0.24 | 0.62 | 0.27 | 1.24 | 0.24 | 0.91 | 0.32 | 0.44 | 0.35 | 0.45 |
| 0.25 | 0.70 | 0.28 | 1.36 | 0.25 | 1.01 | 0.33 | 0.47 | 0.36 | 0.49 |
| 0.26 | 0.79 | 0.29 | 1.49 | 0.26 | 1.12 | 0.34 | 0.51 | 0.37 | 0.54 |
| 0.27 | 0.89 | 0.30 | 1.63 | 0.27 | 1.24 | 0.35 | 0.55 | 0.38 | 0.58 |
| 0.28 | 0.99 | 0.31 | 1.78 | 0.28 | 1.36 | 0.36 | 0.59 | 0.39 | 0.63 |
| 0.29 | 1.11 | 0.32 | 1.93 | 0.29 | 1.49 | 0.37 | 0.63 | 0.40 | 0.69 |
| 0.30 | 1.23 | 0.33 | 2.09 | 0.30 | 1.63 | 0.38 | 0.67 | 0.41 | 0.74 |
| 0.31 | 1.36 | 0.34 | 2.27 | 0.31 | 1.78 | 0.39 | 0.72 | 0.42 | 0.80 |
| 0.32 | 1.50 | 0.35 | 2.44 | 0.32 | 1.93 | 0.40 | 0.77 | 0.43 | 0.87 |
| 0.33 | 1.65 | 0.36 | 2.63 | 0.33 | 2.09 | 0.41 | 0.82 | 0.44 | 0.93 |

Table C-12. Rating Curves Used to Estimate Discharge at COUMI.

| COUMI Table 02 | | COUMI Table 04 | | COUMI Table 05 | | COUMI Table 06 | | COUMI Table 07 | |
|---------------------|--------------------|---------------------|--------------------|---------------------|--------------------|---------------------|--------------------|---------------------|--------------------|
| Water Level (ft) | Discharge (cfs) | Water Level (ft) | Discharge (cfs) | Water Level (ft) | Discharge (cfs) | Water Level (ft) | Discharge (cfs) | Water Level (ft) | Discharge (cfs) |
| 0.34 | 1.81 | 0.37 | 2.83 | 0.34 | 2.27 | 0.42 | 0.87 | 0.45 | 1.00 |
| 0.35 | 1.98 | 0.38 | 3.03 | 0.35 | 2.44 | 0.43 | 0.92 | 0.46 | 1.07 |
| 0.36 | 2.16 | 0.39 | 3.25 | 0.36 | 2.63 | 0.44 | 0.97 | 0.47 | 1.15 |
| 0.37 | 2.35 | 0.40 | 3.47 | 0.37 | 2.83 | 0.45 | 1.03 | 0.48 | 1.26 |
| 0.38 | 2.55 | 0.41 | 3.70 | 0.38 | 3.03 | 0.46 | 1.09 | 0.49 | 1.37 |
| 0.39 | 2.77 | 0.42 | 3.94 | 0.39 | 3.25 | 0.47 | 1.15 | 0.50 | 1.49 |
| 0.40 | 2.99 | 0.43 | 4.19 | 0.40 | 3.47 | 0.48 | 1.26 | 0.51 | 1.61 |
| 0.41 | 3.23 | 0.44 | 4.46 | 0.41 | 3.70 | 0.49 | 1.37 | 0.52 | 1.75 |
| 0.42 | 3.48 | 0.45 | 4.73 | 0.42 | 3.94 | 0.50 | 1.49 | 0.53 | 1.89 |
| 0.43 | 3.74 | 0.46 | 5.01 | 0.43 | 4.19 | 0.51 | 1.61 | 0.54 | 2.05 |
| 0.44 | 4.02 | 0.47 | 5.30 | 0.44 | 4.46 | 0.52 | 1.75 | 0.55 | 2.21 |
| 0.45 | 4.30 | 0.48 | 5.60 | 0.45 | 4.73 | 0.53 | 1.89 | 0.56 | 2.38 |
| 0.46 | 4.61 | 0.49 | 5.91 | 0.46 | 5.01 | 0.54 | 2.05 | 0.57 | 2.56 |
| 0.47 | 4.92 | 0.50 | 6.23 | 0.47 | 5.30 | 0.55 | 2.21 | 0.58 | 2.75 |
| 0.48 | 5.25 | 0.51 | 6.56 | 0.48 | 5.60 | 0.56 | 2.38 | 0.59 | 2.96 |
| 0.49 | 5.60 | 0.52 | 6.91 | 0.49 | 5.91 | 0.57 | 2.56 | 0.60 | 3.17 |
| 0.50 | 5.96 | 0.53 | 7.26 | 0.50 | 6.23 | 0.58 | 2.75 | 0.61 | 3.39 |
| 0.51 | 6.34 | 0.54 | 7.62 | 0.51 | 6.56 | 0.59 | 2.96 | 0.62 | 3.63 |
| 0.52 | 6.73 | 0.55 | 8.00 | 0.52 | 6.91 | 0.60 | 3.17 | 0.63 | 3.88 |
| 0.53 | 7.14 | | | 0.53 | 7.26 | 0.61 | 3.39 | 0.64 | 4.14 |
| 0.54 | 7.56 | | | 0.54 | 7.62 | 0.62 | 3.63 | 0.65 | 4.42 |
| 0.55 | 8.00 | | | 0.55 | 8.00 | 0.63 | 3.88 | 0.66 | 4.71 |
| 0.56 | 8.48 | | | | | 0.64 | 4.14 | 0.67 | 5.01 |
| 0.57 | 8.97 | | | | | 0.65 | 4.42 | 0.68 | 5.33 |
| 0.58 | 9.48 | | | | | 0.66 | 4.71 | 0.69 | 5.66 |
| 0.59 | 10.02 | | | | | 0.67 | 5.01 | 0.70 | 6.01 |
| 0.60 | 10.57 | | | | | 0.68 | 5.33 | 0.71 | 6.37 |
| 0.61 | 11.15 | | | | | 0.69 | 5.66 | 0.72 | 6.75 |
| 0.62 | 11.74 | | | | | 0.70 | 6.01 | 0.73 | 7.15 |
| 0.63 | 12.36 | | | | | 0.71 | 6.37 | 0.74 | 7.57 |
| 0.64 | 13.00 | | | | | 0.72 | 6.75 | 0.75 | 8.00 |
| | | | | | | 0.73 | 7.15 | | |
| | | | | | | 0.74 | 7.57 | | |
| | | | | | | 0.75 | 8.00 | | |

Table C-13. Rating Curves Used to Estimate Discharge at TYLMO.

| TYLMO Table 04 | |
|---------------------|--------------------|
| Water Level (ft) | Discharge (cfs) |
| 0.01 | 0.01 |
| 0.02 | 0.02 |
| 0.03 | 0.04 |
| 0.04 | 0.05 |
| 0.05 | 0.08 |
| 0.06 | 0.11 |
| 0.07 | 0.14 |
| 0.08 | 0.18 |
| 0.09 | 0.23 |
| 0.10 | 0.28 |
| 0.11 | 0.33 |
| 0.12 | 0.39 |
| 0.13 | 0.46 |
| 0.14 | 0.53 |
| 0.15 | 0.60 |
| 0.16 | 0.69 |
| 0.17 | 0.78 |
| 0.18 | 0.88 |
| 0.19 | 0.99 |
| 0.20 | 1.11 |
| 0.21 | 1.23 |
| 0.22 | 1.35 |
| 0.23 | 1.49 |
| 0.24 | 1.63 |
| 0.25 | 1.78 |
| 0.26 | 1.93 |
| 0.27 | 2.09 |
| 0.28 | 2.26 |
| 0.29 | 2.44 |
| 0.30 | 2.62 |
| 0.31 | 2.81 |
| 0.32 | 3.01 |
| 0.33 | 3.21 |
| 0.34 | 3.42 |
| 0.35 | 3.64 |
| 0.36 | 3.86 |
| 0.37 | 4.09 |
| 0.38 | 4.33 |
| 0.39 | 4.58 |
| 0.40 | 4.83 |
| 0.41 | 5.09 |
| 0.42 | 5.36 |
| 0.43 | 5.64 |
| 0.44 | 5.92 |
| 0.45 | 6.21 |
| 0.46 | 6.51 |
| 0.47 | 6.81 |
| 0.48 | 7.12 |

Table C-13. Rating Curves Used to Estimate Discharge at TYLMO.

| TYLMO Table 04 | |
|---------------------|--------------------|
| Water Level (ft) | Discharge (cfs) |
| 0.49 | 7.44 |
| 0.50 | 7.77 |
| 0.51 | 8.10 |
| 0.52 | 8.44 |
| 0.53 | 8.79 |
| 0.54 | 9.15 |
| 0.55 | 9.51 |
| 0.56 | 9.88 |
| 0.57 | 10.26 |
| 0.58 | 10.65 |
| 0.59 | 11.04 |
| 0.60 | 11.45 |
| 0.61 | 11.86 |
| 0.62 | 12.27 |
| 0.63 | 12.70 |
| 0.64 | 13.13 |
| 0.65 | 13.57 |
| 0.66 | 14.02 |
| 0.67 | 14.47 |
| 0.68 | 14.94 |
| 0.69 | 15.41 |
| 0.70 | 15.89 |
| 0.71 | 16.37 |
| 0.72 | 16.87 |
| 0.73 | 17.37 |
| 0.74 | 17.88 |
| 0.75 | 18.40 |
| 0.76 | 18.93 |
| 0.77 | 19.46 |
| 0.78 | 20.00 |
| 0.88 | 16.44 |
| 0.89 | 16.83 |
| 0.90 | 17.23 |
| 0.91 | 17.63 |
| 0.92 | 18.03 |
| 0.93 | 18.45 |
| 0.94 | 18.86 |
| 0.95 | 19.28 |
| 0.96 | 19.71 |
| 0.97 | 20.14 |
| 0.98 | 20.58 |
| 0.99 | 21.02 |
| 1.00 | 21.46 |
| 1.01 | 21.91 |
| 1.02 | 22.37 |
| 1.03 | 22.83 |
| 1.04 | 23.29 |
| 1.05 | 23.76 |

Table C-13. Rating Curves Used to Estimate Discharge at TYLMO.

| TYLMO Table 04 | |
|---------------------|--------------------|
| Water Level (ft) | Discharge (cfs) |
| 1.06 | 24.23 |
| 1.07 | 24.71 |
| 1.08 | 25.20 |
| 1.09 | 25.69 |
| 1.10 | 26.18 |
| 1.11 | 26.68 |
| 1.12 | 27.18 |
| 1.13 | 27.69 |
| 1.14 | 28.21 |
| 1.15 | 28.73 |
| 1.16 | 29.25 |
| 1.17 | 29.78 |
| 1.18 | 30.31 |
| 1.19 | 30.85 |
| 1.20 | 31.39 |
| 1.21 | 31.94 |
| 1.22 | 32.49 |
| 1.23 | 33.05 |
| 1.24 | 33.61 |
| 1.25 | 34.18 |
| 1.26 | 34.76 |
| 1.27 | 35.33 |
| 1.28 | 35.92 |
| 1.29 | 36.50 |
| 1.30 | 37.10 |
| 1.31 | 37.69 |
| 1.32 | 38.30 |
| 1.33 | 38.90 |
| 1.34 | 39.52 |
| 1.35 | 40.13 |
| 1.36 | 40.76 |
| 1.37 | 41.39 |
| 1.38 | 42.02 |
| 1.39 | 42.66 |
| 1.40 | 43.30 |
| 1.41 | 43.95 |
| 1.42 | 44.60 |
| 1.43 | 45.26 |
| 1.44 | 45.92 |
| 1.45 | 46.59 |
| 1.46 | 47.26 |
| 1.47 | 47.94 |
| 1.48 | 48.62 |
| 1.49 | 49.31 |
| 1.50 | 50.00 |

Table C-14. Rating Curves Used to Estimate Discharge at TYLMI.

| TYLMI Table 06 | | TLYMI Table 07 | |
|---------------------|--------------------|---------------------|--------------------|
| Water Level (ft) | Discharge (cfs) | Water Level (ft) | Discharge (cfs) |
| 0.05 | 0.02 | 0.07 | 0.01 |
| 0.06 | 0.02 | 0.08 | 0.02 |
| 0.07 | 0.02 | 0.09 | 0.02 |
| 0.08 | 0.03 | 0.10 | 0.03 |
| 0.09 | 0.03 | 0.11 | 0.04 |
| 0.10 | 0.03 | 0.12 | 0.06 |
| 0.11 | 0.04 | 0.13 | 0.07 |
| 0.12 | 0.06 | 0.14 | 0.10 |
| 0.13 | 0.07 | 0.15 | 0.12 |
| 0.14 | 0.10 | 0.16 | 0.15 |
| 0.15 | 0.12 | 0.17 | 0.19 |
| 0.16 | 0.15 | 0.18 | 0.23 |
| 0.17 | 0.19 | 0.19 | 0.28 |
| 0.18 | 0.23 | 0.20 | 0.33 |
| 0.19 | 0.28 | 0.21 | 0.40 |
| 0.20 | 0.33 | 0.22 | 0.47 |
| 0.21 | 0.40 | 0.23 | 0.54 |
| 0.22 | 0.47 | 0.24 | 0.63 |
| 0.23 | 0.54 | 0.25 | 0.68 |
| 0.24 | 0.63 | 0.26 | 0.74 |
| 0.25 | 0.68 | 0.27 | 0.80 |
| 0.26 | 0.74 | 0.28 | 0.86 |
| 0.27 | 0.80 | 0.29 | 0.92 |
| 0.28 | 0.86 | 0.30 | 0.99 |
| 0.29 | 0.92 | 0.31 | 1.05 |
| 0.30 | 0.99 | 0.32 | 1.12 |
| 0.31 | 1.05 | 0.33 | 1.19 |
| 0.32 | 1.12 | 0.34 | 1.27 |
| 0.33 | 1.19 | 0.35 | 1.34 |
| 0.34 | 1.27 | 0.36 | 1.42 |
| 0.35 | 1.34 | 0.37 | 1.50 |
| 0.36 | 1.42 | 0.38 | 1.58 |
| 0.37 | 1.50 | 0.39 | 1.67 |
| 0.38 | 1.58 | 0.40 | 1.76 |
| 0.39 | 1.67 | 0.41 | 1.85 |
| 0.40 | 1.76 | 0.42 | 1.94 |
| 0.41 | 1.85 | 0.43 | 2.03 |
| 0.42 | 1.94 | 0.44 | 2.13 |
| 0.43 | 2.03 | 0.45 | 2.22 |
| 0.44 | 2.13 | 0.46 | 2.33 |
| 0.45 | 2.22 | 0.47 | 2.43 |
| 0.46 | 2.33 | 0.48 | 2.53 |
| 0.47 | 2.43 | 0.49 | 2.64 |
| 0.48 | 2.53 | 0.50 | 2.75 |
| 0.49 | 2.64 | 0.51 | 2.86 |
| 0.50 | 2.75 | 0.52 | 2.97 |
| 0.51 | 2.86 | 0.53 | 3.09 |
| 0.52 | 2.97 | 0.54 | 3.21 |

Table C-14. Rating Curves Used to Estimate Discharge at TYLMI.

| TYLMI Table 06 | | TLYMI Table 07 | |
|---------------------|--------------------|---------------------|--------------------|
| Water Level (ft) | Discharge (cfs) | Water Level (ft) | Discharge (cfs) |
| 0.53 | 3.09 | 0.55 | 3.33 |
| 0.54 | 3.21 | 0.56 | 3.45 |
| 0.55 | 3.33 | 0.57 | 3.58 |
| 0.56 | 3.45 | 0.58 | 3.70 |
| 0.57 | 3.58 | 0.59 | 3.83 |
| 0.58 | 3.70 | 0.60 | 3.96 |
| 0.59 | 3.83 | 0.61 | 4.10 |
| 0.60 | 3.96 | 0.62 | 4.23 |
| 0.61 | 4.10 | 0.63 | 4.37 |
| 0.62 | 4.23 | 0.64 | 4.51 |
| 0.63 | 4.37 | 0.65 | 4.65 |
| 0.64 | 4.51 | 0.66 | 4.80 |
| 0.65 | 4.65 | 0.67 | 4.95 |
| 0.66 | 4.80 | 0.68 | 5.09 |
| 0.67 | 4.95 | 0.69 | 5.25 |
| 0.68 | 5.09 | 0.70 | 5.40 |
| 0.69 | 5.25 | | |
| 0.70 | 5.40 | | |

APPENDIX D

Summary Statistics for Individual Storm Events by Monitoring Station

Table D-1. Summary Statistics for Individual Storm Events at the EVALSS Station.

| Precipitation Start Time | Precipitation Stop Time | Precipitation Duration (hour) | Precipitation Depth (inch) | Precipitation Average Intensity (inch/hour) | Precipitation Maximum Intensity (inch/hour) | Precipitation Antecedent Dry Period (hour) | Flow Start Time | Flow Stop Time | Flow Duration (hour) | Average Flow Rate (feet ³ /second) | Maximum Flow Rate (feet ³ /second) | Flow Volume (feet ³) |
|--------------------------|-------------------------|-------------------------------|----------------------------|---|---|--|-----------------|-----------------|----------------------|---|---|----------------------------------|
| 3/23/2018 23:35 | 3/24/2018 7:35 | 8 | 0.27 | 0.0338 | 0.24 | 13.8 | 3/23/2018 23:35 | 3/24/2018 19:35 | 20.0833 | 2.2944 | 2.92 | 165885 |
| 3/26/2018 4:50 | 3/26/2018 13:50 | 9 | 0.12 | 0.0133 | 0.12 | 45.7 | 3/26/2018 4:50 | 3/27/2018 1:50 | 21.0833 | 1.7733 | 1.89 | 134595 |
| 3/27/2018 10:20 | 3/27/2018 16:55 | 6.5833 | 0.04 | 0.0061 | 0.12 | 21.6 | 3/27/2018 10:15 | 3/27/2018 21:55 | 11.75 | 1.71 | 1.71 | 72333.12 |
| 3/27/2018 21:55 | 3/28/2018 4:30 | 6.5833 | 0.08 | 0.0122 | 0.12 | 33.2 | 3/27/2018 21:55 | 3/28/2018 16:25 | 18.5833 | 1.7479 | 1.89 | 116936.9 |

Table D-2. Summary Statistics for Individual Storm Events at the EVAMS Station.

| Precipitation Start Time | Precipitation Stop Time | Precipitation Duration (hour) | Precipitation Depth (inch) | Precipitation Average Intensity (inch/hour) | Precipitation Maximum Intensity (inch/hour) | Precipitation Antecedent Dry Period (hour) | Flow Start Time | Flow Stop Time | Flow Duration (hour) | Average Flow Rate (feet ³ /second) | Maximum Flow Rate (feet ³ /second) | Flow Volume (feet ³) |
|--------------------------|-------------------------|-------------------------------|----------------------------|---|---|--|------------------|------------------|----------------------|---|---|----------------------------------|
| 10/7/2017 0:20 | 10/7/2017 4:20 | 4.0 | 0.17 | 0.04 | 0.36 | 151.7 | 10/7/2017 0:20 | 10/7/2017 13:40 | 13.4 | 0.47 | 0.52 | 22,860 |
| 10/7/2017 13:45 | 10/7/2017 18:20 | 4.6 | 0.49 | 0.11 | 1.08 | 11.3 | 10/7/2017 13:40 | 10/7/2017 23:55 | 10.3 | 0.91 | 1.48 | 33,798 |
| 10/7/2017 23:55 | 10/8/2017 5:00 | 5.1 | 0.07 | 0.01 | 0.36 | 7.2 | 10/7/2017 23:55 | 10/8/2017 17:00 | 17.2 | 0.66 | 0.96 | 41,067 |
| 10/10/2017 12:45 | 10/10/2017 20:55 | 8.2 | 0.32 | 0.04 | 0.48 | 55.8 | 10/10/2017 12:40 | 10/11/2017 8:55 | 20.3 | 0.62 | 0.83 | 45,123 |
| 10/12/2017 7:45 | 10/12/2017 12:10 | 4.4 | 0.06 | 0.01 | 0.12 | 37.1 | 10/12/2017 7:40 | 10/12/2017 23:10 | 15.6 | 0.52 | 0.52 | 29,172 |
| 10/12/2017 23:10 | 10/13/2017 11:50 | 12.7 | 0.56 | 0.04 | 0.48 | 13.9 | 10/12/2017 23:10 | 10/13/2017 23:45 | 24.7 | 0.78 | 1.22 | 69,030 |
| 10/17/2017 6:55 | 10/17/2017 11:10 | 4.3 | 0.14 | 0.03 | 0.12 | 95.7 | 10/17/2017 6:55 | 10/17/2017 23:10 | 16.3 | 0.61 | 0.67 | 35,946 |
| 10/18/2017 9:10 | 10/20/2017 2:25 | 41.3 | 1.65 | 0.04 | 0.36 | 22.3 | 10/18/2017 9:10 | 10/20/2017 8:55 | 47.8 | 1.14 | 1.90 | 197,090 |
| 10/20/2017 9:00 | 10/20/2017 11:50 | 2.8 | 0.03 | 0.01 | 0.12 | 6.8 | 10/20/2017 8:55 | 10/20/2017 23:45 | 14.9 | 0.76 | 0.79 | 40,695 |
| 10/21/2017 2:45 | 10/22/2017 1:20 | 22.6 | 0.83 | 0.04 | 0.12 | 24.5 | 10/21/2017 2:45 | 10/22/2017 13:15 | 34.6 | 1.06 | 1.90 | 132,189 |
| 10/25/2017 14:45 | 10/25/2017 19:45 | 5.0 | 0.04 | 0.01 | 0.12 | 87.8 | 10/25/2017 14:45 | 10/26/2017 7:40 | 17.0 | 0.67 | 0.67 | 41,004 |
| 11/1/2017 5:00 | 11/1/2017 8:45 | 3.8 | 0.57 | 0.15 | 0.36 | 158.2 | 11/1/2017 5:00 | 11/1/2017 16:15 | 11.3 | 1.24 | 1.90 | 50,580 |
| 11/1/2017 16:15 | 11/1/2017 16:25 | 0.2 | 0.03 | 0.18 | 0.12 | 7.8 | 11/1/2017 16:15 | 11/2/2017 4:25 | 12.3 | 0.92 | 1.06 | 40,497 |
| 11/2/2017 9:00 | 11/2/2017 17:50 | 8.8 | 0.22 | 0.02 | 0.72 | 24.6 | 11/2/2017 8:55 | 11/2/2017 20:00 | 11.2 | 0.98 | 1.22 | 39,363 |
| 11/2/2017 20:00 | 11/2/2017 21:10 | 1.2 | 0.11 | 0.09 | 0.24 | 8.2 | 11/2/2017 20:00 | 11/3/2017 3:30 | 7.6 | 1.01 | 1.06 | 27,468 |
| 11/3/2017 3:30 | 11/3/2017 16:25 | 12.9 | 0.31 | 0.02 | 0.12 | 6.4 | 11/3/2017 3:30 | 11/4/2017 4:25 | 25.0 | 1.01 | 1.22 | 91,110 |
| 11/4/2017 14:45 | 11/5/2017 15:55 | 25.2 | 1.22 | 0.05 | 0.24 | 23.9 | 11/4/2017 14:45 | 11/6/2017 3:55 | 37.3 | 1.55 | 2.22 | 207,753 |
| 11/8/2017 16:50 | 11/8/2017 18:25 | 1.6 | 0.08 | 0.05 | 0.12 | 73.8 | 11/8/2017 16:50 | 11/9/2017 6:20 | 13.6 | 0.91 | 1.06 | 44,721 |
| 11/9/2017 8:05 | 11/9/2017 22:20 | 14.3 | 0.37 | 0.03 | 0.48 | 14.9 | 11/9/2017 8:00 | 11/10/2017 10:20 | 26.4 | 1.09 | 1.40 | 103,461 |
| 11/11/2017 9:00 | 11/11/2017 15:40 | 6.7 | 0.06 | 0.01 | 0.12 | 37.2 | 11/11/2017 9:00 | 11/12/2017 0:10 | 15.3 | 0.83 | 0.92 | 45,516 |
| 11/12/2017 0:10 | 11/12/2017 8:00 | 7.8 | 0.34 | 0.04 | 0.24 | 12.8 | 11/12/2017 0:10 | 11/12/2017 14:50 | 14.8 | 1.20 | 1.60 | 63,672 |
| 11/12/2017 14:50 | 11/13/2017 7:30 | 16.7 | 0.39 | 0.02 | 0.48 | 7.5 | 11/12/2017 14:50 | 11/13/2017 15:40 | 24.9 | 1.38 | 1.60 | 123,468 |
| 11/13/2017 15:40 | 11/13/2017 19:25 | 3.8 | 0.22 | 0.06 | 0.24 | 8.9 | 11/13/2017 15:40 | 11/14/2017 7:25 | 15.8 | 1.45 | 1.74 | 82,596 |
| 11/14/2017 23:20 | 11/15/2017 10:45 | 11.4 | 0.41 | 0.04 | 0.24 | 30.0 | 11/14/2017 23:15 | 11/15/2017 22:40 | 23.5 | 1.57 | 2.06 | 132,924 |
| 11/16/2017 2:55 | 11/16/2017 14:00 | 11.1 | 0.14 | 0.01 | 0.12 | 18.9 | 11/16/2017 2:55 | 11/17/2017 2:00 | 23.2 | 1.21 | 1.40 | 101,232 |
| 11/19/2017 16:15 | 11/20/2017 16:25 | 24.2 | 0.93 | 0.04 | 0.96 | 77.0 | 11/19/2017 16:15 | 11/21/2017 4:25 | 36.3 | 1.60 | 3.40 | 209,436 |
| 11/21/2017 4:55 | 11/22/2017 7:50 | 26.9 | 1.56 | 0.06 | 0.48 | 13.4 | 11/21/2017 4:50 | 11/22/2017 12:40 | 31.9 | 2.39 | 4.10 | 274,233 |
| 11/22/2017 12:45 | 11/22/2017 13:00 | 0.3 | 0.04 | 0.16 | 0.12 | 10.8 | 11/22/2017 12:40 | 11/22/2017 20:35 | 8.0 | 1.27 | 1.40 | 36,588 |
| 11/22/2017 20:40 | 11/23/2017 1:15 | 4.6 | 0.70 | 0.15 | 1.32 | 7.9 | 11/22/2017 20:35 | 11/23/2017 8:20 | 11.8 | 2.43 | 3.86 | 103,311 |
| 11/23/2017 8:20 | 11/23/2017 13:00 | 4.7 | 0.43 | 0.09 | 0.48 | 7.9 | 11/23/2017 8:20 | 11/24/2017 0:55 | 16.7 | 2.07 | 2.78 | 124,104 |
| 11/24/2017 15:55 | 11/24/2017 18:15 | 2.3 | 0.06 | 0.03 | 0.12 | 27.5 | 11/24/2017 15:55 | 11/25/2017 6:10 | 14.3 | 1.06 | 1.06 | 54,696 |
| 11/25/2017 16:05 | 11/25/2017 21:00 | 4.9 | 0.16 | 0.03 | 0.12 | 23.2 | 11/25/2017 16:05 | 11/26/2017 2:35 | 10.6 | 1.01 | 1.06 | 38,538 |
| 11/26/2017 2:40 | 11/26/2017 19:10 | 16.5 | 0.57 | 0.03 | 0.36 | 6.4 | 11/26/2017 2:35 | 11/27/2017 7:05 | 28.6 | 1.41 | 2.40 | 145,074 |
| 11/28/2017 6:20 | 11/28/2017 16:00 | 9.7 | 0.91 | 0.09 | 0.24 | 39.3 | 11/28/2017 6:20 | 11/29/2017 4:00 | 21.8 | 2.06 | 3.86 | 161,649 |
| 11/30/2017 6:45 | 11/30/2017 10:50 | 4.1 | 0.36 | 0.09 | 0.24 | 39.1 | 11/30/2017 6:40 | 11/30/2017 22:50 | 16.3 | 1.42 | 1.90 | 83,244 |
| 12/1/2017 14:55 | 12/1/2017 21:10 | 6.3 | 0.13 | 0.02 | 0.12 | 29.0 | 12/1/2017 14:55 | 12/2/2017 9:10 | 18.3 | 1.08 | 1.22 | 71,184 |
| 12/2/2017 10:10 | 12/3/2017 0:50 | 14.7 | 0.73 | 0.05 | 0.12 | 15.5 | 12/2/2017 10:10 | 12/3/2017 12:45 | 26.7 | 1.74 | 2.22 | 167,364 |
| 12/15/2017 21:00 | 12/15/2017 22:30 | 1.5 | 0.20 | 0.13 | 0.48 | 309.9 | 12/15/2017 20:55 | 12/16/2017 10:25 | 13.6 | 0.61 | 0.67 | 29,883 |
| 12/16/2017 20:45 | 12/16/2017 23:25 | 2.7 | 0.08 | 0.03 | 0.12 | 23.2 | 12/16/2017 20:45 | 12/17/2017 11:25 | 14.8 | 0.57 | 0.57 | 30,267 |
| 12/18/2017 5:30 | 12/19/2017 12:35 | 31.1 | 1.92 | 0.06 | 0.24 | 31.6 | 12/18/2017 5:30 | 12/20/2017 0:10 | 42.8 | 1.76 | 3.63 | 270,687 |
| 12/20/2017 0:15 | 12/20/2017 3:30 | 3.3 | 0.18 | 0.06 | 0.24 | 12.1 | 12/20/2017 0:10 | 12/20/2017 15:30 | 15.4 | 1.15 | 1.60 | 63,816 |
| 12/22/2017 0:50 | 12/22/2017 11:30 | 10.7 | 0.16 | 0.02 | 0.12 | 46.1 | 12/22/2017 0:45 | 12/22/2017 23:25 | 22.8 | 0.73 | 0.79 | 59,409 |
| 12/25/2017 12:15 | 12/25/2017 16:00 | 3.8 | 0.13 | 0.03 | 0.12 | 75.4 | 12/25/2017 12:10 | 12/26/2017 3:55 | 15.8 | 0.58 | 0.67 | 33,060 |
| 12/26/2017 10:30 | 12/26/2017 13:05 | 2.6 | 0.14 | 0.05 | 0.24 | 19.9 | 12/26/2017 10:25 | 12/27/2017 1:05 | 14.8 | 0.57 | 0.57 | 30,267 |
| 12/27/2017 23:05 | 12/28/2017 2:50 | 3.8 | 0.03 | 0.01 | 0.12 | 34.2 | 12/27/2017 23:00 | 12/28/2017 6:55 | 8.0 | 0.57 | 0.57 | 16,416 |

Table D-2. Summary Statistics for Individual Storm Events at the EVAMS Station.

| Precipitation Start Time | Precipitation Stop Time | Precipitation Duration (hour) | Precipitation Depth (inch) | Precipitation Average Intensity (inch/hour) | Precipitation Maximum Intensity (inch/hour) | Precipitation Antecedent Dry Period (hour) | Flow Start Time | Flow Stop Time | Flow Duration (hour) | Average Flow Rate (feet ³ /second) | Maximum Flow Rate (feet ³ /second) | Flow Volume (feet ³) |
|--------------------------|-------------------------|-------------------------------|----------------------------|---|---|--|------------------|------------------|----------------------|---|---|----------------------------------|
| 12/28/2017 6:55 | 12/28/2017 8:05 | 1.2 | 0.04 | 0.03 | 0.12 | 42.0 | 12/28/2017 6:55 | 12/28/2017 19:25 | 12.6 | 0.65 | 0.67 | 29,421 |
| 12/28/2017 19:25 | 12/29/2017 17:10 | 21.8 | 1.58 | 0.07 | 0.24 | 12.5 | 12/28/2017 19:25 | 12/30/2017 5:10 | 33.8 | 2.11 | 5.16 | 257,367 |
| 1/4/2018 22:40 | 1/5/2018 17:35 | 18.9 | 0.36 | 0.02 | 0.36 | 152.6 | 1/4/2018 22:40 | 1/5/2018 23:55 | 25.3 | 0.71 | 0.92 | 64,812 |
| 1/5/2018 23:55 | 1/6/2018 13:15 | 13.3 | 0.57 | 0.04 | 0.24 | 10.6 | 1/5/2018 23:55 | 1/7/2018 1:15 | 25.4 | 1.06 | 1.40 | 97,323 |
| 1/7/2018 4:25 | 1/8/2018 1:55 | 21.5 | 0.67 | 0.03 | 0.24 | 16.7 | 1/7/2018 4:25 | 1/8/2018 13:50 | 33.5 | 1.02 | 1.74 | 122,892 |
| 1/8/2018 18:10 | 1/9/2018 23:05 | 28.9 | 1.21 | 0.04 | 0.36 | 19.1 | 1/8/2018 18:10 | 1/10/2018 11:00 | 40.9 | 1.58 | 3.18 | 232,599 |
| 1/10/2018 13:45 | 1/11/2018 16:40 | 26.9 | 1.16 | 0.04 | 0.48 | 16.2 | 1/10/2018 13:40 | 1/11/2018 20:55 | 31.3 | 1.91 | 4.35 | 215,760 |
| 1/11/2018 21:00 | 1/12/2018 0:10 | 3.2 | 0.14 | 0.04 | 0.12 | 8.2 | 1/11/2018 20:55 | 1/12/2018 12:10 | 15.3 | 1.58 | 2.06 | 87,066 |
| 1/12/2018 16:45 | 1/12/2018 22:30 | 5.8 | 0.18 | 0.03 | 0.24 | 17.3 | 1/12/2018 16:40 | 1/13/2018 10:25 | 17.8 | 1.07 | 1.22 | 68,418 |
| 1/15/2018 21:20 | 1/16/2018 6:30 | 9.2 | 0.27 | 0.03 | 0.24 | 72.2 | 1/15/2018 21:20 | 1/16/2018 18:30 | 21.3 | 0.88 | 1.06 | 67,062 |
| 1/17/2018 15:10 | 1/18/2018 5:45 | 14.6 | 1.13 | 0.08 | 0.48 | 33.2 | 1/17/2018 15:10 | 1/18/2018 14:25 | 23.3 | 1.92 | 2.98 | 160,857 |
| 1/18/2018 14:25 | 1/18/2018 17:10 | 2.8 | 0.17 | 0.06 | 0.36 | 9.1 | 1/18/2018 14:25 | 1/19/2018 5:10 | 14.8 | 1.27 | 1.74 | 67,626 |
| 1/19/2018 21:55 | 1/20/2018 6:45 | 8.8 | 0.05 | 0.01 | 0.12 | 29.7 | 1/19/2018 21:55 | 1/20/2018 18:40 | 20.8 | 0.80 | 0.92 | 59,646 |
| 1/21/2018 7:20 | 1/21/2018 11:50 | 4.5 | 0.08 | 0.02 | 0.12 | 33.4 | 1/21/2018 7:15 | 1/21/2018 15:55 | 8.8 | 0.74 | 0.79 | 23,193 |
| 1/21/2018 16:00 | 1/21/2018 18:55 | 2.9 | 0.13 | 0.04 | 0.24 | 7.9 | 1/21/2018 15:55 | 1/22/2018 0:45 | 8.9 | 0.88 | 0.92 | 28,128 |
| 1/22/2018 0:45 | 1/22/2018 5:30 | 4.8 | 0.12 | 0.03 | 0.12 | 7.8 | 1/22/2018 0:45 | 1/22/2018 17:30 | 16.8 | 0.81 | 0.92 | 49,368 |
| 1/23/2018 9:00 | 1/24/2018 2:50 | 17.8 | 0.75 | 0.04 | 0.24 | 27.8 | 1/23/2018 8:55 | 1/24/2018 7:40 | 22.8 | 1.27 | 1.90 | 104,469 |
| 1/24/2018 7:40 | 1/25/2018 1:20 | 17.7 | 0.42 | 0.02 | 0.24 | 7.0 | 1/24/2018 7:40 | 1/25/2018 10:05 | 26.5 | 1.24 | 1.90 | 117,942 |
| 1/25/2018 10:10 | 1/25/2018 19:00 | 8.8 | 0.07 | 0.01 | 0.12 | 11.3 | 1/25/2018 10:05 | 1/26/2018 6:55 | 20.9 | 0.91 | 0.92 | 68,652 |
| 1/26/2018 16:35 | 1/27/2018 11:10 | 18.6 | 0.48 | 0.03 | 0.24 | 30.4 | 1/26/2018 16:30 | 1/27/2018 23:10 | 30.8 | 1.11 | 1.60 | 122,751 |
| 1/27/2018 23:45 | 1/28/2018 2:35 | 2.8 | 0.09 | 0.03 | 0.12 | 13.6 | 1/27/2018 23:45 | 1/28/2018 14:35 | 14.9 | 0.98 | 1.06 | 52,428 |
| 1/29/2018 7:50 | 1/29/2018 16:50 | 9.0 | 0.78 | 0.09 | 0.36 | 31.0 | 1/29/2018 7:50 | 1/30/2018 4:50 | 21.1 | 1.74 | 3.40 | 132,402 |
| 2/1/2018 8:35 | 2/2/2018 22:35 | 38.0 | 0.91 | 0.02 | 0.24 | 64.2 | 2/1/2018 8:35 | 2/3/2018 10:30 | 50.0 | 1.34 | 2.40 | 240,755 |
| 2/3/2018 14:20 | 2/4/2018 12:10 | 21.8 | 0.88 | 0.04 | 0.24 | 22.0 | 2/3/2018 14:15 | 2/5/2018 0:10 | 34.0 | 1.59 | 2.98 | 194,663 |
| 2/5/2018 17:15 | 2/6/2018 4:15 | 11.0 | 0.51 | 0.05 | 0.24 | 29.2 | 2/5/2018 17:10 | 2/6/2018 15:30 | 22.4 | 1.26 | 1.74 | 102,042 |
| 2/6/2018 15:30 | 2/7/2018 1:30 | 10.0 | 0.06 | 0.01 | 0.12 | 13.4 | 2/6/2018 15:30 | 2/7/2018 13:25 | 22.0 | 0.92 | 1.06 | 73,158 |
| 2/8/2018 16:30 | 2/8/2018 19:45 | 3.3 | 0.23 | 0.07 | 0.24 | 44.1 | 2/8/2018 16:25 | 2/9/2018 7:40 | 15.3 | 1.09 | 1.60 | 60,084 |
| 2/13/2018 21:05 | 2/14/2018 12:30 | 15.4 | 0.43 | 0.03 | 0.24 | 122.4 | 2/13/2018 21:00 | 2/15/2018 0:30 | 27.6 | 0.91 | 1.06 | 90,255 |
| 2/16/2018 2:10 | 2/16/2018 7:10 | 5.0 | 0.23 | 0.05 | 0.12 | 38.9 | 2/16/2018 2:10 | 2/16/2018 14:25 | 12.3 | 0.83 | 0.92 | 36,672 |
| 2/16/2018 14:30 | 2/17/2018 10:25 | 19.9 | 0.34 | 0.02 | 0.24 | 8.4 | 2/16/2018 14:25 | 2/17/2018 22:25 | 32.1 | 0.82 | 1.06 | 94,185 |
| 2/22/2018 10:25 | 2/22/2018 10:30 | 0.1 | 0.03 | 0.36 | 0.24 | 121.7 | 2/22/2018 10:25 | 2/22/2018 22:25 | 12.1 | 0.57 | 0.57 | 24,795 |
| 2/24/2018 4:50 | 2/24/2018 9:05 | 4.3 | 0.11 | 0.03 | 0.12 | 164.1 | 2/24/2018 4:50 | 2/24/2018 21:00 | 16.3 | 0.64 | 0.67 | 37,725 |
| 2/25/2018 0:10 | 2/25/2018 3:25 | 3.3 | 0.03 | 0.01 | 0.12 | 15.9 | 2/25/2018 0:10 | 2/25/2018 11:00 | 10.9 | 0.58 | 0.67 | 22,761 |
| 2/25/2018 11:00 | 2/25/2018 13:25 | 2.4 | 0.22 | 0.09 | 0.24 | 26.8 | 2/25/2018 11:00 | 2/26/2018 1:25 | 14.5 | 0.78 | 0.92 | 40,557 |
| 2/26/2018 10:10 | 2/26/2018 12:30 | 2.3 | 0.38 | 0.16 | 0.36 | 21.0 | 2/26/2018 10:05 | 2/27/2018 0:30 | 14.5 | 0.86 | 1.06 | 44,649 |
| 2/27/2018 15:25 | 2/27/2018 22:05 | 6.7 | 0.14 | 0.02 | 0.12 | 27.0 | 2/27/2018 15:20 | 2/28/2018 10:05 | 18.8 | 0.91 | 1.06 | 61,914 |
| 2/28/2018 14:15 | 3/1/2018 2:20 | 12.1 | 0.35 | 0.03 | 0.12 | 17.2 | 2/28/2018 14:10 | 3/1/2018 14:15 | 24.2 | 0.96 | 1.22 | 83,163 |
| 3/2/2018 2:00 | 3/2/2018 6:25 | 4.4 | 0.23 | 0.05 | 0.24 | 26.6 | 3/2/2018 2:00 | 3/2/2018 18:20 | 16.4 | 0.85 | 0.92 | 50,511 |
| 3/4/2018 16:00 | 3/4/2018 17:10 | 1.2 | 0.13 | 0.11 | 0.72 | 58.8 | 3/4/2018 15:55 | 3/5/2018 5:10 | 13.3 | 0.59 | 0.79 | 28,116 |
| 3/5/2018 7:20 | 3/5/2018 10:40 | 3.3 | 0.06 | 0.02 | 0.12 | 15.2 | 3/5/2018 7:15 | 3/5/2018 22:40 | 15.5 | 0.52 | 0.57 | 28,866 |
| 3/7/2018 22:55 | 3/7/2018 23:30 | 0.6 | 0.04 | 0.07 | 0.12 | 63.3 | 3/7/2018 22:50 | 3/8/2018 7:25 | 8.7 | 0.48 | 0.57 | 14,964 |
| 3/8/2018 7:25 | 3/8/2018 20:35 | 13.2 | 0.48 | 0.04 | 0.12 | 8.5 | 3/8/2018 7:25 | 3/9/2018 8:35 | 25.3 | 0.74 | 0.92 | 67,089 |
| 3/13/2018 15:05 | 3/13/2018 21:10 | 6.1 | 0.28 | 0.05 | 0.24 | 116.8 | 3/13/2018 15:00 | 3/14/2018 5:35 | 14.7 | 0.57 | 0.79 | 29,844 |
| 3/14/2018 5:35 | 3/14/2018 8:15 | 2.7 | 0.07 | 0.03 | 0.12 | 11.1 | 3/14/2018 5:35 | 3/14/2018 20:10 | 14.7 | 0.54 | 0.57 | 28,476 |
| 3/21/2018 22:30 | 3/22/2018 18:25 | 19.9 | 0.42 | 0.02 | 0.12 | 184.2 | 3/21/2018 22:25 | 3/23/2018 5:25 | 31.1 | 0.48 | 0.67 | 53,793 |
| 3/23/2018 5:30 | 3/23/2018 10:35 | 5.1 | 0.25 | 0.05 | 0.24 | 17.7 | 3/23/2018 5:25 | 3/23/2018 22:30 | 17.2 | 0.53 | 0.79 | 32,982 |

Table D-2. Summary Statistics for Individual Storm Events at the EVAMS Station.

| Precipitation Start Time | Precipitation Stop Time | Precipitation Duration (hour) | Precipitation Depth (inch) | Precipitation Average Intensity (inch/hour) | Precipitation Maximum Intensity (inch/hour) | Precipitation Antecedent Dry Period (hour) | Flow Start Time | Flow Stop Time | Flow Duration (hour) | Average Flow Rate (feet ³ /second) | Maximum Flow Rate (feet ³ /second) | Flow Volume (feet ³) |
|--------------------------|-------------------------|-------------------------------|----------------------------|---|---|--|-----------------|-----------------|----------------------|---|---|----------------------------------|
| 3/23/2018 23:35 | 3/24/2018 7:35 | 8.0 | 0.27 | 0.03 | 0.24 | 13.8 | 3/23/2018 23:35 | 3/24/2018 19:35 | 20.1 | 0.55 | 0.79 | 39,795 |
| 3/26/2018 4:50 | 3/26/2018 13:50 | 9.0 | 0.12 | 0.01 | 0.12 | 45.7 | 3/26/2018 4:50 | 3/27/2018 1:50 | 21.1 | 0.40 | 0.47 | 30,465 |
| 3/27/2018 10:20 | 3/27/2018 16:55 | 6.6 | 0.04 | 0.01 | 0.12 | 21.6 | 3/27/2018 10:15 | 3/27/2018 21:55 | 11.8 | 0.39 | 0.39 | 16,497 |
| 3/27/2018 21:55 | 3/28/2018 4:30 | 6.6 | 0.08 | 0.01 | 0.12 | 33.2 | 3/27/2018 21:55 | 3/28/2018 16:25 | 18.6 | 0.39 | 0.39 | 26,091 |

Table D-3. Summary Statistics for Individual Storm Events at the MONM Station.

| Precipitation Start Time | Precipitation Stop Time | Precipitation Duration (hour) | Precipitation Depth (inch) | Precipitation Average Intensity (inch/hour) | Precipitation Maximum Intensity (inch/hour) | Precipitation Antecedent Dry Period (hour) | Flow Start Time | Flow Stop Time | Flow Duration (hour) | Average Flow Rate (feet ³ /second) | Maximum Flow Rate (feet ³ /second) | Flow Volume (feet ³) |
|--------------------------|-------------------------|-------------------------------|----------------------------|---|---|--|------------------|------------------|----------------------|---|---|----------------------------------|
| 10/7/2017 13:45 | 10/8/2017 3:45 | 14.0 | 0.48 | 0.03 | 0.84 | 12.8 | 10/7/2017 13:40 | 10/8/2017 15:40 | 26.1 | 0.69 | 1.49 | 64,407 |
| 10/10/2017 12:40 | 10/10/2017 19:20 | 6.7 | 0.46 | 0.07 | 0.96 | 68.1 | 10/10/2017 12:40 | 10/11/2017 7:15 | 18.7 | 0.65 | 1.00 | 43,788 |
| 10/12/2017 7:15 | 10/12/2017 15:55 | 8.7 | 0.10 | 0.01 | 0.12 | 36.1 | 10/12/2017 7:15 | 10/12/2017 22:15 | 15.1 | 0.27 | 0.32 | 14,796 |
| 10/12/2017 22:15 | 10/13/2017 7:10 | 8.9 | 0.71 | 0.08 | 0.48 | 10.8 | 10/12/2017 22:15 | 10/13/2017 19:05 | 20.9 | 1.60 | 3.04 | 120,414 |
| 10/17/2017 6:55 | 10/17/2017 11:05 | 4.2 | 0.15 | 0.04 | 0.24 | 95.9 | 10/17/2017 6:55 | 10/17/2017 23:00 | 16.2 | 0.34 | 0.46 | 19,500 |
| 10/18/2017 9:15 | 10/19/2017 21:50 | 36.6 | 1.55 | 0.04 | 0.36 | 22.8 | 10/18/2017 9:10 | 10/20/2017 1:30 | 40.4 | 2.06 | 3.78 | 300,240 |
| 10/20/2017 1:30 | 10/20/2017 11:20 | 9.8 | 0.15 | 0.02 | 0.36 | 6.8 | 10/20/2017 1:30 | 10/20/2017 23:15 | 21.8 | 1.68 | 2.55 | 132,399 |
| 10/21/2017 2:20 | 10/22/2017 0:10 | 21.8 | 0.80 | 0.04 | 0.12 | 24.2 | 10/21/2017 2:15 | 10/22/2017 12:10 | 34.0 | 1.96 | 3.78 | 239,481 |
| 11/1/2017 6:00 | 11/1/2017 9:05 | 3.1 | 0.07 | 0.02 | 0.12 | 248.3 | 11/1/2017 5:55 | 11/1/2017 21:00 | 15.2 | 0.27 | 0.32 | 14,628 |
| 11/2/2017 9:20 | 11/2/2017 11:55 | 2.6 | 0.06 | 0.02 | 0.12 | 26.0 | 11/2/2017 9:20 | 11/2/2017 19:50 | 10.6 | 0.26 | 0.28 | 9,936 |
| 11/2/2017 19:55 | 11/3/2017 14:40 | 18.8 | 0.46 | 0.02 | 0.24 | 8.5 | 11/2/2017 19:50 | 11/4/2017 2:35 | 30.8 | 0.65 | 1.09 | 72,660 |
| 11/4/2017 12:35 | 11/5/2017 14:50 | 26.3 | 1.06 | 0.04 | 0.24 | 22.2 | 11/4/2017 12:30 | 11/6/2017 2:45 | 38.3 | 1.88 | 3.59 | 259,506 |
| 11/8/2017 15:10 | 11/9/2017 0:05 | 8.9 | 0.08 | 0.01 | 0.12 | 73.3 | 11/8/2017 15:10 | 11/9/2017 8:10 | 17.1 | 0.45 | 0.51 | 27,540 |
| 11/9/2017 8:10 | 11/9/2017 22:55 | 14.8 | 0.38 | 0.03 | 0.36 | 15.2 | 11/9/2017 8:10 | 11/10/2017 10:50 | 26.8 | 1.00 | 1.85 | 96,633 |
| 11/11/2017 8:45 | 11/11/2017 20:00 | 11.3 | 0.09 | 0.01 | 0.12 | 36.8 | 11/11/2017 8:45 | 11/12/2017 2:35 | 17.9 | 0.51 | 0.57 | 33,201 |
| 11/12/2017 2:35 | 11/12/2017 8:10 | 5.6 | 0.34 | 0.06 | 0.24 | 11.6 | 11/12/2017 2:35 | 11/12/2017 14:55 | 12.4 | 1.36 | 2.12 | 60,888 |
| 11/12/2017 14:55 | 11/13/2017 6:40 | 15.8 | 0.37 | 0.02 | 0.48 | 7.7 | 11/12/2017 14:55 | 11/13/2017 15:20 | 24.5 | 1.71 | 2.26 | 150,939 |
| 11/13/2017 15:20 | 11/13/2017 18:05 | 2.8 | 0.29 | 0.11 | 0.24 | 12.1 | 11/13/2017 15:20 | 11/14/2017 6:00 | 14.8 | 1.90 | 2.71 | 100,812 |
| 11/14/2017 22:40 | 11/15/2017 10:45 | 12.1 | 0.47 | 0.04 | 0.24 | 29.4 | 11/14/2017 22:40 | 11/15/2017 22:40 | 24.1 | 1.82 | 3.04 | 158,187 |
| 11/16/2017 2:50 | 11/16/2017 9:15 | 6.4 | 0.06 | 0.01 | 0.12 | 18.9 | 11/16/2017 2:50 | 11/16/2017 10:55 | 8.2 | 1.20 | 1.28 | 35,325 |
| 11/16/2017 10:55 | 11/16/2017 12:30 | 1.6 | 0.06 | 0.04 | 0.12 | 7.3 | 11/16/2017 10:55 | 11/17/2017 0:30 | 13.7 | 1.12 | 1.28 | 55,011 |
| 11/19/2017 15:45 | 11/20/2017 16:35 | 24.8 | 0.87 | 0.04 | 1.08 | 76.4 | 11/19/2017 15:40 | 11/21/2017 4:30 | 36.9 | 1.93 | 4.40 | 256,707 |
| 11/21/2017 5:00 | 11/22/2017 6:25 | 25.4 | 1.70 | 0.07 | 0.36 | 13.2 | 11/21/2017 5:00 | 11/22/2017 10:40 | 29.8 | 6.44 | 16.22 | 690,223 |
| 11/22/2017 10:40 | 11/22/2017 15:40 | 5.0 | 0.06 | 0.01 | 0.24 | 8.7 | 11/22/2017 10:40 | 11/22/2017 21:10 | 10.6 | 4.45 | 5.57 | 169,671 |
| 11/22/2017 21:15 | 11/23/2017 0:45 | 3.5 | 0.42 | 0.12 | 0.48 | 10.5 | 11/22/2017 21:10 | 11/23/2017 8:20 | 11.3 | 5.53 | 8.11 | 224,106 |
| 11/23/2017 8:20 | 11/23/2017 13:50 | 5.5 | 0.40 | 0.07 | 0.36 | 8.2 | 11/23/2017 8:20 | 11/24/2017 1:50 | 17.6 | 5.27 | 9.09 | 333,273 |
| 11/24/2017 15:25 | 11/24/2017 18:35 | 3.2 | 0.06 | 0.02 | 0.12 | 26.8 | 11/24/2017 15:20 | 11/25/2017 6:30 | 15.3 | 2.38 | 2.71 | 130,401 |
| 11/25/2017 16:10 | 11/26/2017 2:10 | 10.0 | 0.16 | 0.02 | 0.12 | 23.2 | 11/25/2017 16:05 | 11/26/2017 2:55 | 10.9 | 2.14 | 2.40 | 84,207 |
| 11/26/2017 2:55 | 11/26/2017 19:10 | 16.3 | 0.64 | 0.04 | 0.36 | 6.6 | 11/26/2017 2:55 | 11/27/2017 7:05 | 28.3 | 3.40 | 7.19 | 345,432 |
| 11/28/2017 5:55 | 11/28/2017 16:05 | 10.2 | 0.76 | 0.07 | 0.24 | 38.9 | 11/28/2017 5:55 | 11/29/2017 4:05 | 22.3 | 4.15 | 8.42 | 332,322 |
| 11/29/2017 11:30 | 11/29/2017 12:00 | 0.5 | 0.03 | 0.06 | 0.12 | 20.0 | 11/29/2017 11:25 | 11/29/2017 23:55 | 12.6 | 2.29 | 2.55 | 103,710 |
| 11/30/2017 6:40 | 11/30/2017 10:55 | 4.3 | 0.36 | 0.08 | 0.24 | 39.2 | 11/30/2017 6:40 | 11/30/2017 22:50 | 16.3 | 3.06 | 4.62 | 179,256 |
| 12/1/2017 13:40 | 12/1/2017 18:55 | 5.3 | 0.14 | 0.03 | 0.12 | 27.8 | 12/1/2017 13:40 | 12/2/2017 6:55 | 17.3 | 1.95 | 2.40 | 121,851 |
| 12/2/2017 9:20 | 12/3/2017 0:50 | 15.5 | 0.82 | 0.05 | 0.12 | 14.9 | 12/2/2017 9:20 | 12/3/2017 12:45 | 27.5 | 3.91 | 6.08 | 387,156 |
| 12/15/2017 21:00 | 12/15/2017 21:30 | 0.5 | 0.16 | 0.32 | 0.72 | 308.7 | 12/15/2017 20:55 | 12/16/2017 9:30 | 12.7 | 0.92 | 1.18 | 41,793 |
| 12/16/2017 20:45 | 12/17/2017 0:50 | 4.1 | 0.09 | 0.02 | 0.12 | 23.5 | 12/16/2017 20:45 | 12/17/2017 12:45 | 16.1 | 0.74 | 0.84 | 43,131 |
| 12/18/2017 4:50 | 12/19/2017 12:50 | 32.0 | 1.96 | 0.06 | 0.24 | 30.8 | 12/18/2017 4:50 | 12/19/2017 22:50 | 42.1 | 5.07 | 12.45 | 767,417 |
| 12/19/2017 22:55 | 12/20/2017 4:10 | 5.3 | 0.30 | 0.06 | 0.36 | 10.8 | 12/19/2017 22:50 | 12/20/2017 16:05 | 17.3 | 4.61 | 6.62 | 287,490 |
| 12/22/2017 0:50 | 12/22/2017 9:10 | 8.3 | 0.12 | 0.01 | 0.12 | 46.2 | 12/22/2017 0:45 | 12/22/2017 21:10 | 20.5 | 2.02 | 2.55 | 148,806 |
| 12/25/2017 12:00 | 12/25/2017 17:00 | 5.0 | 0.14 | 0.03 | 0.12 | 78.7 | 12/25/2017 11:55 | 12/26/2017 5:00 | 17.2 | 0.92 | 1.00 | 56,640 |
| 12/26/2017 10:25 | 12/26/2017 12:45 | 2.3 | 0.12 | 0.05 | 0.24 | 19.2 | 12/26/2017 10:25 | 12/27/2017 0:40 | 14.3 | 0.89 | 1.00 | 45,888 |
| 12/27/2017 23:00 | 12/27/2017 23:25 | 0.4 | 0.03 | 0.07 | 0.12 | 34.5 | 12/27/2017 23:00 | 12/28/2017 6:55 | 8.0 | 0.90 | 0.92 | 26,016 |
| 12/28/2017 6:55 | 12/28/2017 7:45 | 0.8 | 0.03 | 0.04 | 0.12 | 42.4 | 12/28/2017 6:55 | 12/28/2017 19:25 | 12.6 | 1.15 | 1.39 | 52,131 |

Table D-3. Summary Statistics for Individual Storm Events at the MONM Station.

| Precipitation Start Time | Precipitation Stop Time | Precipitation Duration (hour) | Precipitation Depth (inch) | Precipitation Average Intensity (inch/hour) | Precipitation Maximum Intensity (inch/hour) | Precipitation Antecedent Dry Period (hour) | Flow Start Time | Flow Stop Time | Flow Duration (hour) | Average Flow Rate (feet ³ /second) | Maximum Flow Rate (feet ³ /second) | Flow Volume (feet ³) |
|--------------------------|-------------------------|-------------------------------|----------------------------|---|---|--|------------------|-----------------|----------------------|---|---|----------------------------------|
| 12/28/2017 19:25 | 12/29/2017 17:30 | 22.1 | 1.49 | 0.07 | 0.36 | 54.9 | 12/28/2017 19:25 | 12/30/2017 5:25 | 34.1 | 5.34 | 13.83 | 655,325 |
| 1/4/2018 22:25 | 1/5/2018 17:45 | 19.3 | 0.38 | 0.02 | 0.24 | 151.9 | 1/4/2018 22:25 | 1/5/2018 23:55 | 25.6 | 1.47 | 2.12 | 135,003 |
| 1/5/2018 23:55 | 1/6/2018 14:00 | 14.1 | 0.66 | 0.05 | 0.12 | 8.7 | 1/5/2018 23:55 | 1/7/2018 2:00 | 26.2 | 3.14 | 4.62 | 295,998 |
| 1/7/2018 5:15 | 1/8/2018 2:00 | 20.8 | 0.68 | 0.03 | 0.12 | 17.0 | 1/7/2018 5:15 | 1/8/2018 14:00 | 32.8 | 3.53 | 5.57 | 417,381 |
| 1/8/2018 22:10 | 1/9/2018 23:25 | 25.3 | 1.20 | 0.05 | 0.36 | 23.2 | 1/8/2018 22:05 | 1/10/2018 11:25 | 37.4 | 5.40 | 12.45 | 727,541 |
| 1/10/2018 13:50 | 1/11/2018 13:35 | 23.8 | 1.09 | 0.05 | 0.24 | 16.6 | 1/10/2018 13:50 | 1/11/2018 21:20 | 31.6 | 6.88 | 18.42 | 782,193 |
| 1/11/2018 21:20 | 1/11/2018 23:25 | 2.1 | 0.09 | 0.04 | 0.12 | 8.7 | 1/11/2018 21:20 | 1/12/2018 11:25 | 14.2 | 6.03 | 7.49 | 307,470 |
| 1/12/2018 13:55 | 1/12/2018 23:55 | 10.0 | 0.17 | 0.02 | 0.12 | 15.3 | 1/12/2018 13:50 | 1/13/2018 11:55 | 22.2 | 4.37 | 5.32 | 348,561 |
| 1/15/2018 21:25 | 1/16/2018 7:20 | 9.9 | 0.22 | 0.02 | 0.12 | 71.7 | 1/15/2018 21:20 | 1/16/2018 19:15 | 22.0 | 2.44 | 2.87 | 193,185 |
| 1/17/2018 15:05 | 1/18/2018 5:25 | 14.3 | 1.19 | 0.08 | 0.48 | 33.2 | 1/17/2018 15:00 | 1/18/2018 14:25 | 23.5 | 5.82 | 10.50 | 492,227 |
| 1/18/2018 14:25 | 1/18/2018 21:15 | 6.8 | 0.21 | 0.03 | 0.24 | 9.2 | 1/18/2018 14:25 | 1/19/2018 9:10 | 18.8 | 4.86 | 6.35 | 329,772 |
| 1/19/2018 9:45 | 1/19/2018 14:40 | 4.9 | 0.03 | 0.01 | 0.12 | 16.7 | 1/19/2018 9:40 | 1/20/2018 2:40 | 17.1 | 3.53 | 4.40 | 217,221 |
| 1/20/2018 3:20 | 1/20/2018 6:55 | 3.6 | 0.03 | 0.01 | 0.12 | 34.2 | 1/20/2018 3:20 | 1/20/2018 18:55 | 15.7 | 2.71 | 3.04 | 152,706 |
| 1/21/2018 6:45 | 1/21/2018 9:25 | 2.7 | 0.07 | 0.03 | 0.12 | 61.7 | 1/21/2018 6:40 | 1/21/2018 15:10 | 8.6 | 2.33 | 2.40 | 71,976 |
| 1/21/2018 15:15 | 1/22/2018 5:30 | 14.3 | 0.38 | 0.03 | 0.48 | 7.5 | 1/21/2018 15:10 | 1/22/2018 17:30 | 26.4 | 2.89 | 3.40 | 274,976 |
| 1/23/2018 8:50 | 1/24/2018 2:55 | 18.1 | 0.81 | 0.04 | 0.36 | 27.5 | 1/23/2018 8:45 | 1/24/2018 7:30 | 22.8 | 4.67 | 6.62 | 384,150 |
| 1/24/2018 7:35 | 1/24/2018 22:50 | 15.3 | 0.40 | 0.03 | 0.24 | 6.9 | 1/24/2018 7:30 | 1/25/2018 10:15 | 26.8 | 4.65 | 6.35 | 449,169 |
| 1/25/2018 10:20 | 1/25/2018 18:55 | 8.6 | 0.10 | 0.01 | 0.12 | 15.8 | 1/25/2018 10:15 | 1/26/2018 6:55 | 20.8 | 3.35 | 3.98 | 250,511 |
| 1/26/2018 18:35 | 1/27/2018 10:55 | 16.3 | 0.49 | 0.03 | 0.12 | 29.2 | 1/26/2018 18:30 | 1/27/2018 22:50 | 28.4 | 3.52 | 4.62 | 359,794 |
| 1/27/2018 23:45 | 1/28/2018 2:45 | 3.0 | 0.09 | 0.03 | 0.12 | 13.7 | 1/27/2018 23:45 | 1/28/2018 14:45 | 15.1 | 3.04 | 3.40 | 165,066 |
| 1/29/2018 7:05 | 1/29/2018 16:45 | 9.7 | 0.78 | 0.08 | 0.24 | 30.5 | 1/29/2018 7:05 | 1/30/2018 4:40 | 21.7 | 5.19 | 10.81 | 404,490 |
| 1/30/2018 12:40 | 1/30/2018 13:15 | 0.6 | 0.03 | 0.05 | 0.12 | 20.4 | 1/30/2018 12:40 | 1/31/2018 1:15 | 12.7 | 3.63 | 4.19 | 165,648 |
| 2/1/2018 8:45 | 2/2/2018 16:00 | 31.3 | 0.84 | 0.03 | 0.24 | 64.5 | 2/1/2018 8:45 | 2/3/2018 3:55 | 43.3 | 4.08 | 6.62 | 635,411 |
| 2/3/2018 14:15 | 2/4/2018 12:05 | 21.8 | 0.81 | 0.04 | 0.24 | 27.8 | 2/3/2018 14:10 | 2/5/2018 0:00 | 33.9 | 5.25 | 10.81 | 641,374 |
| 2/5/2018 17:25 | 2/6/2018 7:00 | 13.6 | 0.43 | 0.03 | 0.12 | 33.4 | 2/5/2018 17:25 | 2/6/2018 16:15 | 22.9 | 4.09 | 4.85 | 337,641 |
| 2/6/2018 16:15 | 2/6/2018 20:35 | 4.3 | 0.03 | 0.01 | 0.12 | 13.2 | 2/6/2018 16:15 | 2/7/2018 8:35 | 16.4 | 3.09 | 3.78 | 182,343 |
| 2/8/2018 14:20 | 2/8/2018 18:15 | 3.9 | 0.11 | 0.03 | 0.12 | 59.2 | 2/8/2018 14:15 | 2/9/2018 6:10 | 16.0 | 2.52 | 2.87 | 145,263 |
| 2/9/2018 6:45 | 2/9/2018 9:30 | 2.8 | 0.03 | 0.01 | 0.12 | 13.1 | 2/9/2018 6:45 | 2/9/2018 21:30 | 14.8 | 2.35 | 2.87 | 125,709 |
| 2/13/2018 20:50 | 2/14/2018 11:35 | 14.8 | 0.44 | 0.03 | 0.12 | 123.2 | 2/13/2018 20:45 | 2/14/2018 23:35 | 26.9 | 2.11 | 2.71 | 204,395 |
| 2/16/2018 2:10 | 2/16/2018 7:40 | 5.5 | 0.19 | 0.03 | 0.12 | 39.1 | 2/16/2018 2:10 | 2/16/2018 13:50 | 11.8 | 2.11 | 2.55 | 89,355 |
| 2/16/2018 13:50 | 2/17/2018 10:30 | 20.7 | 0.49 | 0.02 | 0.36 | 7.9 | 2/16/2018 13:50 | 2/17/2018 22:25 | 32.7 | 2.77 | 3.78 | 325,770 |
| 2/22/2018 11:30 | 2/22/2018 13:10 | 1.7 | 0.04 | 0.02 | 0.24 | 122.8 | 2/22/2018 11:25 | 2/23/2018 1:05 | 13.8 | 0.89 | 0.92 | 44,028 |
| 2/24/2018 4:40 | 2/24/2018 8:25 | 3.8 | 0.10 | 0.03 | 0.24 | 41.2 | 2/24/2018 4:40 | 2/24/2018 20:25 | 15.8 | 1.04 | 1.18 | 59,337 |
| 2/25/2018 1:30 | 2/25/2018 3:10 | 1.7 | 0.04 | 0.02 | 0.12 | 17.6 | 2/25/2018 1:30 | 2/25/2018 10:50 | 9.4 | 0.98 | 1.00 | 33,252 |
| 2/25/2018 10:55 | 2/25/2018 13:10 | 2.3 | 0.18 | 0.08 | 0.24 | 9.4 | 2/25/2018 10:50 | 2/26/2018 1:05 | 14.3 | 1.61 | 1.85 | 83,193 |
| 2/26/2018 9:50 | 2/26/2018 16:15 | 6.4 | 0.48 | 0.07 | 0.36 | 21.6 | 2/26/2018 9:45 | 2/27/2018 4:15 | 18.6 | 1.77 | 2.12 | 118,521 |
| 2/27/2018 15:15 | 2/27/2018 22:00 | 6.8 | 0.11 | 0.02 | 0.12 | 23.2 | 2/27/2018 15:10 | 2/28/2018 9:55 | 18.8 | 1.76 | 1.98 | 119,622 |
| 2/28/2018 13:10 | 3/1/2018 2:30 | 13.3 | 0.36 | 0.03 | 0.12 | 15.8 | 2/28/2018 13:05 | 3/1/2018 14:25 | 25.4 | 2.33 | 3.22 | 213,573 |
| 3/2/2018 2:00 | 3/2/2018 6:25 | 4.4 | 0.22 | 0.05 | 0.12 | 26.7 | 3/2/2018 2:00 | 3/2/2018 18:20 | 16.4 | 2.15 | 2.55 | 127,056 |
| 3/4/2018 14:20 | 3/4/2018 16:25 | 2.1 | 0.10 | 0.05 | 0.36 | 57.3 | 3/4/2018 14:15 | 3/5/2018 4:25 | 14.3 | 1.34 | 1.49 | 68,520 |
| 3/5/2018 7:25 | 3/5/2018 8:35 | 1.2 | 0.03 | 0.03 | 0.12 | 15.3 | 3/5/2018 7:25 | 3/5/2018 20:35 | 13.3 | 1.21 | 1.28 | 57,951 |
| 3/7/2018 22:40 | 3/7/2018 23:35 | 0.9 | 0.05 | 0.05 | 0.12 | 78.6 | 3/7/2018 22:40 | 3/8/2018 7:25 | 8.8 | 0.96 | 1.00 | 30,432 |
| 3/8/2018 7:25 | 3/8/2018 19:45 | 12.3 | 0.64 | 0.05 | 0.36 | 8.5 | 3/8/2018 7:25 | 3/9/2018 7:40 | 24.3 | 2.61 | 4.40 | 228,780 |
| 3/13/2018 14:50 | 3/13/2018 19:30 | 4.7 | 0.26 | 0.06 | 0.12 | 116.8 | 3/13/2018 14:45 | 3/14/2018 6:10 | 15.5 | 1.47 | 2.12 | 82,290 |

Table D-3. Summary Statistics for Individual Storm Events at the MONM Station.

| Precipitation Start Time | Precipitation Stop Time | Precipitation Duration (hour) | Precipitation Depth (inch) | Precipitation Average Intensity (inch/hour) | Precipitation Maximum Intensity (inch/hour) | Precipitation Antecedent Dry Period (hour) | Flow Start Time | Flow Stop Time | Flow Duration (hour) | Average Flow Rate (feet ³ /second) | Maximum Flow Rate (feet ³ /second) | Flow Volume (feet ³) |
|--------------------------|-------------------------|-------------------------------|----------------------------|---|---|--|-----------------|-----------------|----------------------|---|---|----------------------------------|
| 3/14/2018 6:15 | 3/14/2018 9:35 | 3.3 | 0.04 | 0.01 | 0.12 | 11.8 | 3/14/2018 6:10 | 3/14/2018 21:30 | 15.4 | 1.29 | 1.73 | 71,670 |
| 3/21/2018 21:40 | 3/22/2018 21:55 | 24.3 | 0.50 | 0.02 | 0.24 | 183.4 | 3/21/2018 21:40 | 3/23/2018 6:20 | 32.8 | 1.39 | 2.40 | 163,905 |
| 3/23/2018 6:20 | 3/23/2018 11:00 | 4.7 | 0.38 | 0.08 | 0.24 | 14.3 | 3/23/2018 6:20 | 3/23/2018 23:00 | 16.8 | 2.21 | 3.22 | 133,482 |
| 3/23/2018 23:35 | 3/24/2018 6:30 | 6.9 | 0.26 | 0.04 | 0.24 | 13.6 | 3/23/2018 23:35 | 3/24/2018 18:30 | 19.0 | 2.19 | 2.87 | 149,580 |
| 3/26/2018 4:40 | 3/26/2018 10:30 | 5.8 | 0.03 | 0.01 | 0.12 | 46.8 | 3/26/2018 4:40 | 3/26/2018 11:00 | 6.4 | 1.05 | 1.18 | 24,180 |
| 3/26/2018 11:05 | 3/26/2018 13:35 | 2.5 | 0.04 | 0.02 | 0.12 | 53.2 | 3/26/2018 11:00 | 3/27/2018 1:30 | 14.6 | 1.18 | 1.28 | 62,085 |
| 3/27/2018 10:05 | 3/28/2018 2:15 | 16.2 | 0.16 | 0.01 | 0.12 | 23.0 | 3/27/2018 10:05 | 3/28/2018 14:10 | 28.2 | 1.22 | 1.39 | 123,324 |
| 4/1/2018 7:20 | 4/2/2018 0:25 | 17.1 | 0.30 | 0.02 | 0.24 | 104.8 | 4/1/2018 7:15 | 4/2/2018 12:20 | 29.2 | 1.05 | 1.61 | 110,622 |

Table D-4. Summary Statistics for Individual Storm Events at the MONMN Station.

| Precipitation Start Time | Precipitation Stop Time | Precipitation Duration (hour) | Precipitation Depth (inch) | Precipitation Average Intensity (inch/hour) | Precipitation Maximum Intensity (inch/hour) | Precipitation Antecedent Dry Period (hour) | Flow Start Time | Flow Stop Time | Flow Duration (hour) | Average Flow Rate (feet ³ /second) | Maximum Flow Rate (feet ³ /second) | Flow Volume (feet ³) |
|--------------------------|-------------------------|-------------------------------|----------------------------|---|---|--|------------------|------------------|----------------------|---|---|----------------------------------|
| 10/7/2017 13:45 | 10/8/2017 3:45 | 14.0 | 0.480 | 0.03 | 0.84 | 12.8 | 10/7/2017 13:40 | 10/8/2017 15:40 | 26.1 | 0.13 | 0.25 | 12,282 |
| 10/10/2017 12:40 | 10/10/2017 19:20 | 6.7 | 0.460 | 0.07 | 0.96 | 68.1 | 10/10/2017 12:40 | 10/11/2017 7:15 | 18.7 | 0.12 | 0.17 | 8,394 |
| 10/12/2017 7:15 | 10/12/2017 15:55 | 8.7 | 0.100 | 0.01 | 0.12 | 36.1 | 10/12/2017 7:15 | 10/12/2017 22:15 | 15.1 | 0.07 | 0.08 | 3,642 |
| 10/12/2017 22:15 | 10/13/2017 7:10 | 8.9 | 0.710 | 0.08 | 0.48 | 10.8 | 10/12/2017 22:15 | 10/13/2017 19:05 | 20.9 | 0.53 | 0.96 | 40,254 |
| 10/17/2017 6:55 | 10/17/2017 11:05 | 4.2 | 0.150 | 0.04 | 0.24 | 95.9 | 10/17/2017 6:55 | 10/17/2017 23:00 | 16.2 | 0.12 | 0.13 | 6,912 |
| 10/18/2017 9:15 | 10/19/2017 21:50 | 36.6 | 1.550 | 0.04 | 0.36 | 22.8 | 10/18/2017 9:10 | 10/20/2017 1:30 | 40.4 | 0.72 | 1.52 | 104,448 |
| 10/20/2017 1:30 | 10/20/2017 11:20 | 9.8 | 0.150 | 0.02 | 0.36 | 6.8 | 10/20/2017 1:30 | 10/20/2017 23:15 | 21.8 | 0.72 | 1.09 | 56,862 |
| 10/21/2017 2:20 | 10/22/2017 0:10 | 21.8 | 0.800 | 0.04 | 0.12 | 24.2 | 10/21/2017 2:15 | 10/22/2017 12:10 | 34.0 | 0.79 | 1.61 | 96,387 |
| 11/1/2017 6:00 | 11/1/2017 9:05 | 3.1 | 0.070 | 0.02 | 0.12 | 248.3 | 11/1/2017 5:55 | 11/1/2017 21:00 | 15.2 | 0.08 | 0.08 | 4,368 |
| 11/2/2017 9:20 | 11/2/2017 11:55 | 2.6 | 0.060 | 0.02 | 0.12 | 26.0 | 11/2/2017 9:20 | 11/2/2017 19:50 | 10.6 | 0.09 | 0.11 | 3,372 |
| 11/2/2017 19:55 | 11/3/2017 14:40 | 18.8 | 0.460 | 0.02 | 0.24 | 8.5 | 11/2/2017 19:50 | 11/4/2017 2:35 | 30.8 | 0.27 | 0.40 | 29,886 |
| 11/4/2017 12:35 | 11/5/2017 14:50 | 26.3 | 1.060 | 0.04 | 0.24 | 22.2 | 11/4/2017 12:30 | 11/6/2017 2:45 | 38.3 | 0.76 | 1.69 | 104,766 |
| 11/8/2017 15:10 | 11/9/2017 0:05 | 8.9 | 0.080 | 0.01 | 0.12 | 73.3 | 11/8/2017 15:10 | 11/9/2017 8:10 | 17.1 | 0.14 | 0.15 | 8,673 |
| 11/9/2017 8:10 | 11/9/2017 22:55 | 14.8 | 0.380 | 0.03 | 0.36 | 15.2 | 11/9/2017 8:10 | 11/10/2017 10:50 | 26.8 | 0.35 | 0.59 | 33,330 |
| 11/11/2017 8:45 | 11/11/2017 20:00 | 11.3 | 0.090 | 0.01 | 0.12 | 36.8 | 11/11/2017 8:45 | 11/12/2017 2:35 | 17.9 | 0.18 | 0.22 | 11,712 |
| 11/12/2017 2:35 | 11/12/2017 8:10 | 5.6 | 0.340 | 0.06 | 0.24 | 11.6 | 11/12/2017 2:35 | 11/12/2017 14:55 | 12.4 | 0.49 | 0.79 | 21,696 |
| 11/12/2017 14:55 | 11/13/2017 6:40 | 15.8 | 0.370 | 0.02 | 0.48 | 7.7 | 11/12/2017 14:55 | 11/13/2017 15:20 | 24.5 | 0.77 | 1.22 | 68,109 |
| 11/13/2017 15:20 | 11/13/2017 18:05 | 2.8 | 0.290 | 0.11 | 0.24 | 12.1 | 11/13/2017 15:20 | 11/14/2017 6:00 | 14.8 | 0.85 | 1.22 | 45,033 |
| 11/14/2017 22:40 | 11/15/2017 10:45 | 12.1 | 0.470 | 0.04 | 0.24 | 29.4 | 11/14/2017 22:40 | 11/15/2017 22:40 | 24.1 | 0.88 | 1.52 | 75,930 |
| 11/16/2017 2:50 | 11/16/2017 9:15 | 6.4 | 0.060 | 0.01 | 0.12 | 18.9 | 11/16/2017 2:50 | 11/16/2017 10:55 | 8.2 | 0.54 | 0.59 | 15,882 |
| 11/16/2017 10:55 | 11/16/2017 12:30 | 1.6 | 0.060 | 0.04 | 0.12 | 7.3 | 11/16/2017 10:55 | 11/17/2017 0:30 | 13.7 | 0.48 | 0.59 | 23,802 |
| 11/19/2017 15:45 | 11/20/2017 16:35 | 24.8 | 0.870 | 0.04 | 1.08 | 76.4 | 11/19/2017 15:40 | 11/21/2017 4:30 | 36.9 | 1.11 | 2.60 | 147,228 |
| 11/21/2017 5:00 | 11/22/2017 6:25 | 25.4 | 1.700 | 0.07 | 0.36 | 13.2 | 11/21/2017 5:00 | 11/22/2017 10:40 | 29.8 | 3.37 | 14.31 | 360,780 |
| 11/22/2017 10:40 | 11/22/2017 15:40 | 5.0 | 0.060 | 0.01 | 0.24 | 8.7 | 11/22/2017 10:40 | 11/22/2017 21:10 | 10.6 | 1.63 | 2.06 | 62,214 |
| 11/22/2017 21:15 | 11/23/2017 0:45 | 3.5 | 0.420 | 0.12 | 0.48 | 10.5 | 11/22/2017 21:10 | 11/23/2017 8:20 | 11.3 | 2.00 | 2.83 | 81,150 |
| 11/23/2017 8:20 | 11/23/2017 13:50 | 5.5 | 0.400 | 0.07 | 0.36 | 8.2 | 11/23/2017 8:20 | 11/24/2017 1:50 | 17.6 | 1.94 | 3.48 | 122,517 |
| 11/24/2017 15:25 | 11/24/2017 18:35 | 3.2 | 0.060 | 0.02 | 0.12 | 26.8 | 11/24/2017 15:20 | 11/25/2017 6:30 | 15.3 | 0.84 | 0.96 | 45,885 |
| 11/25/2017 16:10 | 11/26/2017 2:10 | 10.0 | 0.160 | 0.02 | 0.12 | 23.2 | 11/25/2017 16:05 | 11/26/2017 2:55 | 10.9 | 0.79 | 1.09 | 30,999 |
| 11/26/2017 2:55 | 11/26/2017 19:10 | 16.3 | 0.640 | 0.04 | 0.36 | 6.6 | 11/26/2017 2:55 | 11/27/2017 7:05 | 28.3 | 1.21 | 2.48 | 122,586 |
| 11/28/2017 5:55 | 11/28/2017 16:05 | 10.2 | 0.760 | 0.07 | 0.24 | 38.9 | 11/28/2017 5:55 | 11/29/2017 4:05 | 22.3 | 1.54 | 3.48 | 123,207 |
| 11/29/2017 11:30 | 11/29/2017 12:00 | 0.5 | 0.030 | 0.06 | 0.12 | 20.0 | 11/29/2017 11:25 | 11/29/2017 23:55 | 12.6 | 0.80 | 0.96 | 36,015 |
| 11/30/2017 6:40 | 11/30/2017 10:55 | 4.3 | 0.360 | 0.08 | 0.24 | 39.2 | 11/30/2017 6:40 | 11/30/2017 22:50 | 16.3 | 1.09 | 1.69 | 63,810 |
| 12/1/2017 13:40 | 12/1/2017 18:55 | 5.3 | 0.140 | 0.03 | 0.12 | 27.8 | 12/1/2017 13:40 | 12/2/2017 6:55 | 17.3 | 0.73 | 0.90 | 45,828 |
| 12/2/2017 9:20 | 12/3/2017 0:50 | 15.5 | 0.820 | 0.05 | 0.12 | 14.9 | 12/2/2017 9:20 | 12/3/2017 12:45 | 27.5 | 1.28 | 1.97 | 127,056 |
| 12/15/2017 21:00 | 12/15/2017 21:30 | 0.5 | 0.160 | 0.32 | 0.72 | 308.7 | 12/15/2017 20:55 | 12/16/2017 9:30 | 12.7 | 0.22 | 0.33 | 9,813 |
| 12/16/2017 20:45 | 12/17/2017 0:50 | 4.1 | 0.090 | 0.02 | 0.12 | 23.5 | 12/16/2017 20:45 | 12/17/2017 12:45 | 16.1 | 0.14 | 0.17 | 7,917 |
| 12/18/2017 4:50 | 12/19/2017 12:50 | 32.0 | 1.960 | 0.06 | 0.24 | 30.8 | 12/18/2017 4:50 | 12/19/2017 22:50 | 42.1 | 2.11 | 7.90 | 320,316 |
| 12/19/2017 22:55 | 12/20/2017 4:10 | 5.3 | 0.300 | 0.06 | 0.36 | 10.8 | 12/19/2017 22:50 | 12/20/2017 16:05 | 17.3 | 1.93 | 2.83 | 120,582 |
| 12/22/2017 0:50 | 12/22/2017 9:10 | 8.3 | 0.120 | 0.01 | 0.12 | 46.2 | 12/22/2017 0:45 | 12/22/2017 21:10 | 20.5 | 0.84 | 1.29 | 62,139 |
| 12/25/2017 12:00 | 12/25/2017 17:00 | 5.0 | 0.140 | 0.03 | 0.12 | 78.7 | 12/25/2017 11:55 | 12/26/2017 5:00 | 17.2 | 0.26 | 0.27 | 16,146 |
| 12/26/2017 10:25 | 12/26/2017 12:45 | 2.3 | 0.120 | 0.05 | 0.24 | 19.2 | 12/26/2017 10:25 | 12/27/2017 0:40 | 14.3 | 0.24 | 0.27 | 12,618 |
| 12/27/2017 23:00 | 12/27/2017 23:25 | 0.4 | 0.030 | 0.07 | 0.12 | 34.5 | 12/27/2017 23:00 | 12/28/2017 6:55 | 8.0 | 0.23 | 0.25 | 6,651 |
| 12/28/2017 6:55 | 12/28/2017 7:45 | 0.8 | 0.030 | 0.04 | 0.12 | 42.4 | 12/28/2017 6:55 | 12/28/2017 19:25 | 12.6 | 0.40 | 0.64 | 17,925 |
| 12/28/2017 19:25 | 12/29/2017 17:30 | 22.1 | 1.490 | 0.07 | 0.36 | 54.9 | 12/28/2017 19:25 | 12/30/2017 5:25 | 34.1 | 2.36 | 9.36 | 289,842 |
| 1/4/2018 22:25 | 1/5/2018 17:45 | 19.3 | 0.380 | 0.02 | 0.24 | 151.9 | 1/4/2018 22:25 | 1/5/2018 23:55 | 25.6 | 0.66 | 1.09 | 60,615 |

Table D-4. Summary Statistics for Individual Storm Events at the MONMN Station.

| Precipitation Start Time | Precipitation Stop Time | Precipitation Duration (hour) | Precipitation Depth (inch) | Precipitation Average Intensity (inch/hour) | Precipitation Maximum Intensity (inch/hour) | Precipitation Antecedent Dry Period (hour) | Flow Start Time | Flow Stop Time | Flow Duration (hour) | Average Flow Rate (feet ³ /second) | Maximum Flow Rate (feet ³ /second) | Flow Volume (feet ³) |
|--------------------------|-------------------------|-------------------------------|----------------------------|---|---|--|-----------------|-----------------|----------------------|---|---|----------------------------------|
| 1/5/2018 23:55 | 1/6/2018 14:00 | 14.1 | 0.660 | 0.05 | 0.12 | 8.7 | 1/5/2018 23:55 | 1/7/2018 2:00 | 26.2 | 1.42 | 2.06 | 133,302 |
| 1/7/2018 5:15 | 1/8/2018 2:00 | 20.8 | 0.680 | 0.03 | 0.12 | 17.0 | 1/7/2018 5:15 | 1/8/2018 14:00 | 32.8 | 1.67 | 2.37 | 197,940 |
| 1/8/2018 22:10 | 1/9/2018 23:25 | 25.3 | 1.200 | 0.05 | 0.36 | 23.2 | 1/8/2018 22:05 | 1/10/2018 11:25 | 37.4 | 2.71 | 8.85 | 364,365 |
| 1/10/2018 13:50 | 1/11/2018 13:35 | 23.8 | 1.090 | 0.05 | 0.24 | 16.6 | 1/10/2018 13:50 | 1/11/2018 21:20 | 31.6 | 3.55 | 13.59 | 403,662 |
| 1/11/2018 21:20 | 1/11/2018 23:25 | 2.1 | 0.090 | 0.04 | 0.12 | 8.7 | 1/11/2018 21:20 | 1/12/2018 11:25 | 14.2 | 2.14 | 2.60 | 109,227 |
| 1/12/2018 13:55 | 1/12/2018 23:55 | 10.0 | 0.170 | 0.02 | 0.12 | 15.3 | 1/12/2018 13:50 | 1/13/2018 11:55 | 22.2 | 1.62 | 2.16 | 129,345 |
| 1/15/2018 21:25 | 1/16/2018 7:20 | 9.9 | 0.220 | 0.02 | 0.12 | 71.7 | 1/15/2018 21:20 | 1/16/2018 19:15 | 22.0 | 1.03 | 1.37 | 81,660 |
| 1/17/2018 15:05 | 1/18/2018 5:25 | 14.3 | 1.190 | 0.08 | 0.48 | 33.2 | 1/17/2018 15:00 | 1/18/2018 14:25 | 23.5 | 2.17 | 3.34 | 183,693 |
| 1/18/2018 14:25 | 1/18/2018 21:15 | 6.8 | 0.210 | 0.03 | 0.24 | 9.2 | 1/18/2018 14:25 | 1/19/2018 9:10 | 18.8 | 1.88 | 2.37 | 127,167 |
| 1/19/2018 9:45 | 1/19/2018 14:40 | 4.9 | 0.030 | 0.01 | 0.12 | 16.7 | 1/19/2018 9:40 | 1/20/2018 2:40 | 17.1 | 1.43 | 1.87 | 87,807 |
| 1/20/2018 3:20 | 1/20/2018 6:55 | 3.6 | 0.030 | 0.01 | 0.12 | 34.2 | 1/20/2018 3:20 | 1/20/2018 18:55 | 15.7 | 1.09 | 1.15 | 61,653 |
| 1/21/2018 6:45 | 1/21/2018 9:25 | 2.7 | 0.070 | 0.03 | 0.12 | 61.7 | 1/21/2018 6:40 | 1/21/2018 15:10 | 8.6 | 0.95 | 0.96 | 29,502 |
| 1/21/2018 15:15 | 1/22/2018 5:30 | 14.3 | 0.380 | 0.03 | 0.48 | 7.5 | 1/21/2018 15:10 | 1/22/2018 17:30 | 26.4 | 1.16 | 1.61 | 110,559 |
| 1/23/2018 8:50 | 1/24/2018 2:55 | 18.1 | 0.810 | 0.04 | 0.36 | 27.5 | 1/23/2018 8:45 | 1/24/2018 7:30 | 22.8 | 1.77 | 2.27 | 145,791 |
| 1/24/2018 7:35 | 1/24/2018 22:50 | 15.3 | 0.400 | 0.03 | 0.24 | 6.9 | 1/24/2018 7:30 | 1/25/2018 10:15 | 26.8 | 1.71 | 2.16 | 165,654 |
| 1/25/2018 10:20 | 1/25/2018 18:55 | 8.6 | 0.100 | 0.01 | 0.12 | 15.8 | 1/25/2018 10:15 | 1/26/2018 6:55 | 20.8 | 1.26 | 1.37 | 93,858 |
| 1/26/2018 18:35 | 1/27/2018 10:55 | 16.3 | 0.490 | 0.03 | 0.12 | 29.2 | 1/26/2018 18:30 | 1/27/2018 22:50 | 28.4 | 1.26 | 1.61 | 128,685 |
| 1/27/2018 23:45 | 1/28/2018 2:45 | 3.0 | 0.090 | 0.03 | 0.12 | 13.7 | 1/27/2018 23:45 | 1/28/2018 14:45 | 15.1 | 1.11 | 1.22 | 60,198 |
| 1/29/2018 7:05 | 1/29/2018 16:45 | 9.7 | 0.780 | 0.08 | 0.24 | 30.5 | 1/29/2018 7:05 | 1/30/2018 4:40 | 21.7 | 1.80 | 3.34 | 140,124 |
| 1/30/2018 12:40 | 1/30/2018 13:15 | 0.6 | 0.030 | 0.05 | 0.12 | 20.4 | 1/30/2018 12:40 | 1/31/2018 1:15 | 12.7 | 1.34 | 2.30 | 60,942 |
| 2/1/2018 8:45 | 2/2/2018 16:00 | 31.3 | 0.840 | 0.03 | 0.24 | 64.5 | 2/1/2018 8:45 | 2/3/2018 3:55 | 43.3 | 1.29 | 2.06 | 200,628 |
| 2/3/2018 14:15 | 2/4/2018 12:05 | 21.8 | 0.810 | 0.04 | 0.24 | 27.8 | 2/3/2018 14:10 | 2/5/2018 0:00 | 33.9 | 1.66 | 3.76 | 202,895 |
| 2/5/2018 17:25 | 2/6/2018 7:00 | 13.6 | 0.430 | 0.03 | 0.12 | 33.4 | 2/5/2018 17:25 | 2/6/2018 16:15 | 22.9 | 1.19 | 1.52 | 97,956 |
| 2/6/2018 16:15 | 2/6/2018 20:35 | 4.3 | 0.030 | 0.01 | 0.12 | 13.2 | 2/6/2018 16:15 | 2/7/2018 8:35 | 16.4 | 0.90 | 1.11 | 53,106 |
| 2/8/2018 14:20 | 2/8/2018 18:15 | 3.9 | 0.110 | 0.03 | 0.12 | 59.2 | 2/8/2018 14:15 | 2/9/2018 6:10 | 16.0 | 0.69 | 0.79 | 39,984 |
| 2/9/2018 6:45 | 2/9/2018 9:30 | 2.8 | 0.030 | 0.01 | 0.12 | 13.1 | 2/9/2018 6:45 | 2/9/2018 21:30 | 14.8 | 0.69 | 0.96 | 36,861 |
| 2/13/2018 20:50 | 2/14/2018 11:35 | 14.8 | 0.440 | 0.03 | 0.12 | 123.2 | 2/13/2018 20:45 | 2/14/2018 23:35 | 26.9 | 0.36 | 0.59 | 35,037 |
| 2/16/2018 2:10 | 2/16/2018 7:40 | 5.5 | 0.190 | 0.03 | 0.12 | 39.1 | 2/16/2018 2:10 | 2/16/2018 13:50 | 11.8 | 0.52 | 0.79 | 21,789 |
| 2/16/2018 13:50 | 2/17/2018 10:30 | 20.7 | 0.490 | 0.02 | 0.36 | 7.9 | 2/16/2018 13:50 | 2/17/2018 22:25 | 32.7 | 0.62 | 0.90 | 72,798 |
| 2/22/2018 11:30 | 2/22/2018 13:10 | 1.7 | 0.040 | 0.02 | 0.24 | 122.8 | 2/22/2018 11:25 | 2/23/2018 1:05 | 13.8 | 0.16 | 0.20 | 7,740 |
| 2/24/2018 4:40 | 2/24/2018 8:25 | 3.8 | 0.100 | 0.03 | 0.24 | 41.2 | 2/24/2018 4:40 | 2/24/2018 20:25 | 15.8 | 0.18 | 0.22 | 10,533 |
| 2/25/2018 1:30 | 2/25/2018 3:10 | 1.7 | 0.040 | 0.02 | 0.12 | 17.6 | 2/25/2018 1:30 | 2/25/2018 10:50 | 9.4 | 0.15 | 0.17 | 5,013 |
| 2/25/2018 10:55 | 2/25/2018 13:10 | 2.3 | 0.180 | 0.08 | 0.24 | 9.4 | 2/25/2018 10:50 | 2/26/2018 1:05 | 14.3 | 0.37 | 0.47 | 19,290 |
| 2/26/2018 9:50 | 2/26/2018 16:15 | 6.4 | 0.480 | 0.07 | 0.36 | 21.6 | 2/26/2018 9:45 | 2/27/2018 4:15 | 18.6 | 0.44 | 0.55 | 29,730 |
| 2/27/2018 15:15 | 2/27/2018 22:00 | 6.8 | 0.110 | 0.02 | 0.12 | 23.2 | 2/27/2018 15:10 | 2/28/2018 9:55 | 18.8 | 0.45 | 0.51 | 30,624 |
| 2/28/2018 13:10 | 3/1/2018 2:30 | 13.3 | 0.360 | 0.03 | 0.12 | 15.8 | 2/28/2018 13:05 | 3/1/2018 14:25 | 25.4 | 0.63 | 0.84 | 57,318 |
| 3/2/2018 2:00 | 3/2/2018 6:25 | 4.4 | 0.220 | 0.05 | 0.12 | 26.7 | 3/2/2018 2:00 | 3/2/2018 18:20 | 16.4 | 0.55 | 0.69 | 32,334 |
| 3/4/2018 14:20 | 3/4/2018 16:25 | 2.1 | 0.100 | 0.05 | 0.36 | 57.3 | 3/4/2018 14:15 | 3/5/2018 4:25 | 14.3 | 0.39 | 0.51 | 20,133 |
| 3/5/2018 7:25 | 3/5/2018 8:35 | 1.2 | 0.030 | 0.03 | 0.12 | 15.3 | 3/5/2018 7:25 | 3/5/2018 20:35 | 13.3 | 0.34 | 0.40 | 16,341 |
| 3/7/2018 22:40 | 3/7/2018 23:35 | 0.9 | 0.050 | 0.05 | 0.12 | 78.6 | 3/7/2018 22:40 | 3/8/2018 7:25 | 8.8 | 0.22 | 0.25 | 6,975 |
| 3/8/2018 7:25 | 3/8/2018 19:45 | 12.3 | 0.640 | 0.05 | 0.36 | 8.5 | 3/8/2018 7:25 | 3/9/2018 7:40 | 24.3 | 0.71 | 1.29 | 61,890 |
| 3/13/2018 14:50 | 3/13/2018 19:30 | 4.7 | 0.260 | 0.06 | 0.12 | 116.8 | 3/13/2018 14:45 | 3/14/2018 6:10 | 15.5 | 0.39 | 0.64 | 22,011 |
| 3/14/2018 6:15 | 3/14/2018 9:35 | 3.3 | 0.040 | 0.01 | 0.12 | 11.8 | 3/14/2018 6:10 | 3/14/2018 21:30 | 15.4 | 0.38 | 0.69 | 21,090 |
| 3/21/2018 21:40 | 3/22/2018 21:55 | 24.3 | 0.500 | 0.02 | 0.24 | 183.4 | 3/21/2018 21:40 | 3/23/2018 6:20 | 32.8 | 0.38 | 0.84 | 44,472 |
| 3/23/2018 6:20 | 3/23/2018 11:00 | 4.7 | 0.380 | 0.08 | 0.24 | 14.3 | 3/23/2018 6:20 | 3/23/2018 23:00 | 16.8 | 0.57 | 0.90 | 34,617 |
| 3/23/2018 23:35 | 3/24/2018 6:30 | 6.9 | 0.260 | 0.04 | 0.24 | 13.6 | 3/23/2018 23:35 | 3/24/2018 18:30 | 19.0 | 0.61 | 0.84 | 41,592 |

Table D-4. Summary Statistics for Individual Storm Events at the MONMN Station.

| Precipitation Start Time | Precipitation Stop Time | Precipitation Duration (hour) | Precipitation Depth (inch) | Precipitation Average Intensity (inch/hour) | Precipitation Maximum Intensity (inch/hour) | Precipitation Antecedent Dry Period (hour) | Flow Start Time | Flow Stop Time | Flow Duration (hour) | Average Flow Rate (feet ³ /second) | Maximum Flow Rate (feet ³ /second) | Flow Volume (feet ³) |
|--------------------------|-------------------------|-------------------------------|----------------------------|---|---|--|-----------------|-----------------|----------------------|---|---|----------------------------------|
| 3/26/2018 4:40 | 3/26/2018 10:30 | 5.8 | 0.030 | 0.01 | 0.12 | 46.8 | 3/26/2018 4:40 | 3/26/2018 11:00 | 6.4 | 0.25 | 0.27 | 5,853 |
| 3/26/2018 11:05 | 3/26/2018 13:35 | 2.5 | 0.040 | 0.02 | 0.12 | 53.2 | 3/26/2018 11:00 | 3/27/2018 1:30 | 14.6 | 0.25 | 0.30 | 13,176 |
| 3/27/2018 10:05 | 3/28/2018 2:15 | 16.2 | 0.160 | 0.01 | 0.12 | 23.0 | 3/27/2018 10:05 | 3/28/2018 14:10 | 28.2 | 0.33 | 0.55 | 33,585 |
| 4/1/2018 7:20 | 4/2/2018 0:25 | 17.1 | 0.300 | 0.02 | 0.24 | 104.8 | 4/1/2018 7:15 | 4/2/2018 12:20 | 29.2 | 0.26 | 0.43 | 27,693 |

Table D-5. Summary Statistics for Individual Storm Events at the MONMS Station.

| Precipitation Start Time | Precipitation Stop Time | Precipitation Duration (hour) | Precipitation Depth (inch) | Precipitation Average Intensity (inch/hour) | Precipitation Maximum Intensity (inch/hour) | Precipitation Antecedent Dry Period (hour) | Flow Start Time | Flow Stop Time | Flow Duration (hour) | Average Flow Rate (feet ³ /second) | Maximum Flow Rate (feet ³ /second) | Flow Volume (feet ³) |
|--------------------------|-------------------------|-------------------------------|----------------------------|---|---|--|------------------|------------------|----------------------|---|---|----------------------------------|
| 10/7/2017 13:45 | 10/8/2017 3:45 | 14.0 | 0.48 | 0.03 | 0.84 | 12.8 | 10/7/2017 13:40 | 10/8/2017 15:40 | 26.1 | 0.10 | 0.33 | 9,486 |
| 10/10/2017 12:40 | 10/10/2017 19:20 | 6.7 | 0.46 | 0.07 | 0.96 | 68.1 | 10/10/2017 12:40 | 10/11/2017 7:15 | 18.7 | 0.10 | 0.19 | 6,507 |
| 10/12/2017 7:15 | 10/12/2017 15:55 | 8.7 | 0.10 | 0.01 | 0.12 | 36.1 | 10/12/2017 7:15 | 10/12/2017 22:15 | 15.1 | 0.05 | 0.06 | 2,709 |
| 10/12/2017 22:15 | 10/13/2017 7:10 | 8.9 | 0.71 | 0.08 | 0.48 | 10.8 | 10/12/2017 22:15 | 10/13/2017 19:05 | 20.9 | 0.25 | 0.62 | 19,068 |
| 10/17/2017 6:55 | 10/17/2017 11:05 | 4.2 | 0.15 | 0.04 | 0.24 | 95.9 | 10/17/2017 6:55 | 10/17/2017 23:00 | 16.2 | 0.06 | 0.09 | 3,708 |
| 10/18/2017 9:15 | 10/19/2017 21:50 | 36.6 | 1.55 | 0.04 | 0.36 | 22.8 | 10/18/2017 9:10 | 10/20/2017 1:30 | 40.4 | 0.25 | 0.60 | 36,864 |
| 10/20/2017 1:30 | 10/20/2017 11:20 | 9.8 | 0.15 | 0.02 | 0.36 | 6.8 | 10/20/2017 1:30 | 10/20/2017 23:15 | 21.8 | 0.15 | 0.29 | 11,502 |
| 10/21/2017 2:20 | 10/22/2017 0:10 | 21.8 | 0.80 | 0.04 | 0.12 | 24.2 | 10/21/2017 2:15 | 10/22/2017 12:10 | 34.0 | 0.24 | 0.54 | 28,866 |
| 11/1/2017 6:00 | 11/1/2017 9:05 | 3.1 | 0.07 | 0.02 | 0.12 | 248.3 | 11/1/2017 5:55 | 11/1/2017 21:00 | 15.2 | 0.05 | 0.05 | 2,526 |
| 11/2/2017 9:20 | 11/2/2017 11:55 | 2.6 | 0.06 | 0.02 | 0.12 | 26.0 | 11/2/2017 9:20 | 11/2/2017 19:50 | 10.6 | 0.05 | 0.05 | 1,803 |
| 11/2/2017 19:55 | 11/3/2017 14:40 | 18.8 | 0.46 | 0.02 | 0.24 | 8.5 | 11/2/2017 19:50 | 11/4/2017 2:35 | 30.8 | 0.10 | 0.16 | 11,046 |
| 11/4/2017 12:35 | 11/5/2017 14:50 | 26.3 | 1.06 | 0.04 | 0.24 | 22.2 | 11/4/2017 12:30 | 11/6/2017 2:45 | 38.3 | 0.25 | 0.52 | 34,209 |
| 11/8/2017 15:10 | 11/9/2017 0:05 | 8.9 | 0.08 | 0.01 | 0.12 | 73.3 | 11/8/2017 15:10 | 11/9/2017 8:10 | 17.1 | 0.08 | 0.09 | 5,004 |
| 11/9/2017 8:10 | 11/9/2017 22:55 | 14.8 | 0.38 | 0.03 | 0.36 | 15.2 | 11/9/2017 8:10 | 11/10/2017 10:50 | 26.8 | 0.13 | 0.27 | 12,936 |
| 11/11/2017 8:45 | 11/11/2017 20:00 | 11.3 | 0.09 | 0.01 | 0.12 | 36.8 | 11/11/2017 8:45 | 11/12/2017 2:35 | 17.9 | 0.08 | 0.10 | 5,472 |
| 11/12/2017 2:35 | 11/12/2017 8:10 | 5.6 | 0.34 | 0.06 | 0.24 | 11.6 | 11/12/2017 2:35 | 11/12/2017 14:55 | 12.4 | 0.19 | 0.40 | 8,439 |
| 11/12/2017 14:55 | 11/13/2017 6:40 | 15.8 | 0.37 | 0.02 | 0.48 | 7.7 | 11/12/2017 14:55 | 11/13/2017 15:20 | 24.5 | 0.21 | 0.35 | 18,897 |
| 11/13/2017 15:20 | 11/13/2017 18:05 | 2.8 | 0.29 | 0.11 | 0.24 | 12.1 | 11/13/2017 15:20 | 11/14/2017 6:00 | 14.8 | 0.27 | 0.47 | 14,070 |
| 11/14/2017 22:40 | 11/15/2017 10:45 | 12.1 | 0.47 | 0.04 | 0.24 | 29.4 | 11/14/2017 22:40 | 11/15/2017 22:40 | 24.1 | 0.27 | 0.49 | 23,688 |
| 11/16/2017 2:50 | 11/16/2017 9:15 | 6.4 | 0.06 | 0.01 | 0.12 | 18.9 | 11/16/2017 2:50 | 11/16/2017 10:55 | 8.2 | 0.18 | 0.21 | 5,349 |
| 11/16/2017 10:55 | 11/16/2017 12:30 | 1.6 | 0.06 | 0.04 | 0.12 | 7.3 | 11/16/2017 10:55 | 11/17/2017 0:30 | 13.7 | 0.17 | 0.21 | 8,286 |
| 11/19/2017 15:45 | 11/20/2017 16:35 | 24.8 | 0.87 | 0.04 | 1.08 | 76.4 | 11/19/2017 15:40 | 11/21/2017 4:30 | 36.9 | 0.27 | 0.71 | 35,568 |
| 11/21/2017 5:00 | 11/22/2017 6:25 | 25.4 | 1.70 | 0.07 | 0.36 | 13.2 | 11/21/2017 5:00 | 11/22/2017 10:40 | 29.8 | 1.02 | 2.39 | 109,671 |
| 11/22/2017 10:40 | 11/22/2017 15:40 | 5.0 | 0.06 | 0.01 | 0.24 | 8.7 | 11/22/2017 10:40 | 11/22/2017 21:10 | 10.6 | 0.43 | 0.54 | 16,464 |
| 11/22/2017 21:15 | 11/23/2017 0:45 | 3.5 | 0.42 | 0.12 | 0.48 | 10.5 | 11/22/2017 21:10 | 11/23/2017 8:20 | 11.3 | 0.75 | 1.13 | 30,258 |
| 11/23/2017 8:20 | 11/23/2017 13:50 | 5.5 | 0.40 | 0.07 | 0.36 | 8.2 | 11/23/2017 8:20 | 11/24/2017 1:50 | 17.6 | 0.66 | 1.21 | 41,568 |
| 11/24/2017 15:25 | 11/24/2017 18:35 | 3.2 | 0.06 | 0.02 | 0.12 | 26.8 | 11/24/2017 15:20 | 11/25/2017 6:30 | 15.3 | 0.22 | 0.27 | 12,249 |
| 11/25/2017 16:10 | 11/26/2017 2:10 | 10.0 | 0.16 | 0.02 | 0.12 | 23.2 | 11/25/2017 16:05 | 11/26/2017 2:55 | 10.9 | 0.23 | 0.31 | 9,162 |
| 11/26/2017 2:55 | 11/26/2017 19:10 | 16.3 | 0.64 | 0.04 | 0.36 | 6.6 | 11/26/2017 2:55 | 11/27/2017 7:05 | 28.3 | 0.45 | 1.17 | 45,465 |
| 11/28/2017 5:55 | 11/28/2017 16:05 | 10.2 | 0.76 | 0.07 | 0.24 | 38.9 | 11/28/2017 5:55 | 11/29/2017 4:05 | 22.3 | 0.55 | 1.29 | 44,391 |
| 11/29/2017 11:30 | 11/29/2017 12:00 | 0.5 | 0.03 | 0.06 | 0.12 | 20.0 | 11/29/2017 11:25 | 11/29/2017 23:55 | 12.6 | 0.21 | 0.24 | 9,378 |
| 11/30/2017 6:40 | 11/30/2017 10:55 | 4.3 | 0.36 | 0.08 | 0.24 | 39.2 | 11/30/2017 6:40 | 11/30/2017 22:50 | 16.3 | 0.35 | 0.62 | 20,214 |
| 12/1/2017 13:40 | 12/1/2017 18:55 | 5.3 | 0.14 | 0.03 | 0.12 | 27.8 | 12/1/2017 13:40 | 12/2/2017 6:55 | 17.3 | 0.20 | 0.26 | 12,246 |
| 12/2/2017 9:20 | 12/3/2017 0:50 | 15.5 | 0.82 | 0.05 | 0.12 | 14.9 | 12/2/2017 9:20 | 12/3/2017 12:45 | 27.5 | 0.56 | 0.94 | 55,062 |
| 12/15/2017 21:00 | 12/15/2017 21:30 | 0.5 | 0.16 | 0.32 | 0.72 | 308.7 | 12/15/2017 20:55 | 12/16/2017 9:30 | 12.7 | 0.11 | 0.14 | 4,989 |
| 12/16/2017 20:45 | 12/17/2017 0:50 | 4.1 | 0.09 | 0.02 | 0.12 | 23.5 | 12/16/2017 20:45 | 12/17/2017 12:45 | 16.1 | 0.11 | 0.12 | 6,462 |
| 12/18/2017 4:50 | 12/19/2017 12:50 | 32.0 | 1.96 | 0.06 | 0.24 | 30.8 | 12/18/2017 4:50 | 12/19/2017 22:50 | 42.1 | 0.70 | 1.74 | 105,600 |
| 12/19/2017 22:55 | 12/20/2017 4:10 | 5.3 | 0.30 | 0.06 | 0.36 | 10.8 | 12/19/2017 22:50 | 12/20/2017 16:05 | 17.3 | 0.53 | 0.87 | 33,060 |
| 12/22/2017 0:50 | 12/22/2017 9:10 | 8.3 | 0.12 | 0.01 | 0.12 | 46.2 | 12/22/2017 0:45 | 12/22/2017 21:10 | 20.5 | 0.23 | 0.26 | 16,827 |
| 12/25/2017 12:00 | 12/25/2017 17:00 | 5.0 | 0.14 | 0.03 | 0.12 | 78.7 | 12/25/2017 11:55 | 12/26/2017 5:00 | 17.2 | 0.15 | 0.15 | 9,027 |
| 12/26/2017 10:25 | 12/26/2017 12:45 | 2.3 | 0.12 | 0.05 | 0.24 | 19.2 | 12/26/2017 10:25 | 12/27/2017 0:40 | 14.3 | 0.14 | 0.15 | 7,293 |
| 12/27/2017 23:00 | 12/27/2017 23:25 | 0.4 | 0.03 | 0.07 | 0.12 | 34.5 | 12/27/2017 23:00 | 12/28/2017 6:55 | 8.0 | 0.15 | 0.16 | 4,293 |
| 12/28/2017 6:55 | 12/28/2017 7:45 | 0.8 | 0.03 | 0.04 | 0.12 | 42.4 | 12/28/2017 6:55 | 12/28/2017 19:25 | 12.6 | 0.16 | 0.18 | 7,158 |
| 12/28/2017 19:25 | 12/29/2017 17:30 | 22.1 | 1.49 | 0.07 | 0.36 | 54.9 | 12/28/2017 19:25 | 12/30/2017 5:25 | 34.1 | 0.78 | 1.95 | 95,226 |

Table D-5. Summary Statistics for Individual Storm Events at the MONMS Station.

| Precipitation Start Time | Precipitation Stop Time | Precipitation Duration (hour) | Precipitation Depth (inch) | Precipitation Average Intensity (inch/hour) | Precipitation Maximum Intensity (inch/hour) | Precipitation Antecedent Dry Period (hour) | Flow Start Time | Flow Stop Time | Flow Duration (hour) | Average Flow Rate (feet ³ /second) | Maximum Flow Rate (feet ³ /second) | Flow Volume (feet ³) |
|--------------------------|-------------------------|-------------------------------|----------------------------|---|---|--|-----------------|-----------------|----------------------|---|---|----------------------------------|
| 1/4/2018 22:25 | 1/5/2018 17:45 | 19.3 | 0.38 | 0.02 | 0.24 | 151.9 | 1/4/2018 22:25 | 1/5/2018 23:55 | 25.6 | 0.20 | 0.27 | 18,603 |
| 1/5/2018 23:55 | 1/6/2018 14:00 | 14.1 | 0.66 | 0.05 | 0.12 | 8.7 | 1/5/2018 23:55 | 1/7/2018 2:00 | 26.2 | 0.44 | 0.77 | 41,760 |
| 1/7/2018 5:15 | 1/8/2018 2:00 | 20.8 | 0.68 | 0.03 | 0.12 | 17.0 | 1/7/2018 5:15 | 1/8/2018 14:00 | 32.8 | 0.46 | 0.84 | 54,630 |
| 1/8/2018 22:10 | 1/9/2018 23:25 | 25.3 | 1.20 | 0.05 | 0.36 | 23.2 | 1/8/2018 22:05 | 1/10/2018 11:25 | 37.4 | 0.70 | 1.79 | 94,695 |
| 1/10/2018 13:50 | 1/11/2018 13:35 | 23.8 | 1.09 | 0.05 | 0.24 | 16.6 | 1/10/2018 13:50 | 1/11/2018 21:20 | 31.6 | 0.81 | 2.22 | 92,466 |
| 1/11/2018 21:20 | 1/11/2018 23:25 | 2.1 | 0.09 | 0.04 | 0.12 | 8.7 | 1/11/2018 21:20 | 1/12/2018 11:25 | 14.2 | 0.59 | 0.81 | 29,943 |
| 1/12/2018 13:55 | 1/12/2018 23:55 | 10.0 | 0.17 | 0.02 | 0.12 | 15.3 | 1/12/2018 13:50 | 1/13/2018 11:55 | 22.2 | 0.40 | 0.49 | 32,190 |
| 1/15/2018 21:25 | 1/16/2018 7:20 | 9.9 | 0.22 | 0.02 | 0.12 | 71.7 | 1/15/2018 21:20 | 1/16/2018 19:15 | 22.0 | 0.25 | 0.31 | 19,410 |
| 1/17/2018 15:05 | 1/18/2018 5:25 | 14.3 | 1.19 | 0.08 | 0.48 | 33.2 | 1/17/2018 15:00 | 1/18/2018 14:25 | 23.5 | 0.77 | 1.55 | 65,010 |
| 1/18/2018 14:25 | 1/18/2018 21:15 | 6.8 | 0.21 | 0.03 | 0.24 | 9.2 | 1/18/2018 14:25 | 1/19/2018 9:10 | 18.8 | 0.50 | 0.77 | 33,912 |
| 1/19/2018 9:45 | 1/19/2018 14:40 | 4.9 | 0.03 | 0.01 | 0.12 | 16.7 | 1/19/2018 9:40 | 1/20/2018 2:40 | 17.1 | 0.31 | 0.35 | 19,215 |
| 1/20/2018 3:20 | 1/20/2018 6:55 | 3.6 | 0.03 | 0.01 | 0.12 | 34.2 | 1/20/2018 3:20 | 1/20/2018 18:55 | 15.7 | 0.26 | 0.29 | 14,880 |
| 1/21/2018 6:45 | 1/21/2018 9:25 | 2.7 | 0.07 | 0.03 | 0.12 | 61.7 | 1/21/2018 6:40 | 1/21/2018 15:10 | 8.6 | 0.25 | 0.29 | 7,743 |
| 1/21/2018 15:15 | 1/22/2018 5:30 | 14.3 | 0.38 | 0.03 | 0.48 | 7.5 | 1/21/2018 15:10 | 1/22/2018 17:30 | 26.4 | 0.31 | 0.44 | 29,814 |
| 1/23/2018 8:50 | 1/24/2018 2:55 | 18.1 | 0.81 | 0.04 | 0.36 | 27.5 | 1/23/2018 8:45 | 1/24/2018 7:30 | 22.8 | 0.59 | 1.01 | 48,324 |
| 1/24/2018 7:35 | 1/24/2018 22:50 | 15.3 | 0.40 | 0.03 | 0.24 | 6.9 | 1/24/2018 7:30 | 1/25/2018 10:15 | 26.8 | 0.51 | 0.84 | 49,332 |
| 1/25/2018 10:20 | 1/25/2018 18:55 | 8.6 | 0.10 | 0.01 | 0.12 | 15.8 | 1/25/2018 10:15 | 1/26/2018 6:55 | 20.8 | 0.32 | 0.40 | 24,009 |
| 1/26/2018 18:35 | 1/27/2018 10:55 | 16.3 | 0.49 | 0.03 | 0.12 | 29.2 | 1/26/2018 18:30 | 1/27/2018 22:50 | 28.4 | 0.39 | 0.60 | 39,759 |
| 1/27/2018 23:45 | 1/28/2018 2:45 | 3.0 | 0.09 | 0.03 | 0.12 | 13.7 | 1/27/2018 23:45 | 1/28/2018 14:45 | 15.1 | 0.30 | 0.37 | 16,335 |
| 1/29/2018 7:05 | 1/29/2018 16:45 | 9.7 | 0.78 | 0.08 | 0.24 | 30.5 | 1/29/2018 7:05 | 1/30/2018 4:40 | 21.7 | 0.62 | 1.60 | 48,660 |
| 1/30/2018 12:40 | 1/30/2018 13:15 | 0.6 | 0.03 | 0.05 | 0.12 | 20.4 | 1/30/2018 12:40 | 1/31/2018 1:15 | 12.7 | 0.31 | 0.35 | 14,130 |
| 2/1/2018 8:45 | 2/2/2018 16:00 | 31.3 | 0.84 | 0.03 | 0.24 | 64.5 | 2/1/2018 8:45 | 2/3/2018 3:55 | 43.3 | 0.44 | 0.87 | 69,117 |
| 2/3/2018 14:15 | 2/4/2018 12:05 | 21.8 | 0.81 | 0.04 | 0.24 | 27.8 | 2/3/2018 14:10 | 2/5/2018 0:00 | 33.9 | 0.61 | 1.55 | 74,667 |
| 2/5/2018 17:25 | 2/6/2018 7:00 | 13.6 | 0.43 | 0.03 | 0.12 | 33.4 | 2/5/2018 17:25 | 2/6/2018 16:15 | 22.9 | 0.46 | 0.65 | 37,635 |
| 2/6/2018 16:15 | 2/6/2018 20:35 | 4.3 | 0.03 | 0.01 | 0.12 | 13.2 | 2/6/2018 16:15 | 2/7/2018 8:35 | 16.4 | 0.31 | 0.35 | 18,495 |
| 2/8/2018 14:20 | 2/8/2018 18:15 | 3.9 | 0.11 | 0.03 | 0.12 | 59.2 | 2/8/2018 14:15 | 2/9/2018 6:10 | 16.0 | 0.25 | 0.31 | 14,490 |
| 2/9/2018 6:45 | 2/9/2018 9:30 | 2.8 | 0.03 | 0.01 | 0.12 | 13.1 | 2/9/2018 6:45 | 2/9/2018 21:30 | 14.8 | 0.23 | 0.24 | 12,084 |
| 2/13/2018 20:50 | 2/14/2018 11:35 | 14.8 | 0.44 | 0.03 | 0.12 | 123.2 | 2/13/2018 20:45 | 2/14/2018 23:35 | 26.9 | 0.26 | 0.37 | 25,017 |
| 2/16/2018 2:10 | 2/16/2018 7:40 | 5.5 | 0.19 | 0.03 | 0.12 | 39.1 | 2/16/2018 2:10 | 2/16/2018 13:50 | 11.8 | 0.24 | 0.29 | 10,203 |
| 2/16/2018 13:50 | 2/17/2018 10:30 | 20.7 | 0.49 | 0.02 | 0.36 | 7.9 | 2/16/2018 13:50 | 2/17/2018 22:25 | 32.7 | 0.33 | 0.49 | 38,550 |
| 2/22/2018 11:30 | 2/22/2018 13:10 | 1.7 | 0.04 | 0.02 | 0.24 | 122.8 | 2/22/2018 11:25 | 2/23/2018 1:05 | 13.8 | 0.13 | 0.14 | 6,438 |
| 2/24/2018 4:40 | 2/24/2018 8:25 | 3.8 | 0.10 | 0.03 | 0.24 | 41.2 | 2/24/2018 4:40 | 2/24/2018 20:25 | 15.8 | 0.15 | 0.16 | 8,331 |
| 2/25/2018 1:30 | 2/25/2018 3:10 | 1.7 | 0.04 | 0.02 | 0.12 | 17.6 | 2/25/2018 1:30 | 2/25/2018 10:50 | 9.4 | 0.14 | 0.15 | 4,830 |
| 2/25/2018 10:55 | 2/25/2018 13:10 | 2.3 | 0.18 | 0.08 | 0.24 | 9.4 | 2/25/2018 10:50 | 2/26/2018 1:05 | 14.3 | 0.22 | 0.29 | 11,190 |
| 2/26/2018 9:50 | 2/26/2018 16:15 | 6.4 | 0.48 | 0.07 | 0.36 | 21.6 | 2/26/2018 9:45 | 2/27/2018 4:15 | 18.6 | 0.22 | 0.26 | 14,469 |
| 2/27/2018 15:15 | 2/27/2018 22:00 | 6.8 | 0.11 | 0.02 | 0.12 | 23.2 | 2/27/2018 15:10 | 2/28/2018 9:55 | 18.8 | 0.22 | 0.27 | 14,769 |
| 2/28/2018 13:10 | 3/1/2018 2:30 | 13.3 | 0.36 | 0.03 | 0.12 | 15.8 | 2/28/2018 13:05 | 3/1/2018 14:25 | 25.4 | 0.28 | 0.44 | 25,548 |
| 3/2/2018 2:00 | 3/2/2018 6:25 | 4.4 | 0.22 | 0.05 | 0.12 | 26.7 | 3/2/2018 2:00 | 3/2/2018 18:20 | 16.4 | 0.25 | 0.35 | 15,054 |
| 3/4/2018 14:20 | 3/4/2018 16:25 | 2.1 | 0.10 | 0.05 | 0.36 | 57.3 | 3/4/2018 14:15 | 3/5/2018 4:25 | 14.3 | 0.16 | 0.22 | 8,349 |
| 3/5/2018 7:25 | 3/5/2018 8:35 | 1.2 | 0.03 | 0.03 | 0.12 | 15.3 | 3/5/2018 7:25 | 3/5/2018 20:35 | 13.3 | 0.15 | 0.16 | 7,107 |
| 3/7/2018 22:40 | 3/7/2018 23:35 | 0.9 | 0.05 | 0.05 | 0.12 | 78.6 | 3/7/2018 22:40 | 3/8/2018 7:25 | 8.8 | 0.14 | 0.14 | 4,320 |
| 3/8/2018 7:25 | 3/8/2018 19:45 | 12.3 | 0.64 | 0.05 | 0.36 | 8.5 | 3/8/2018 7:25 | 3/9/2018 7:40 | 24.3 | 0.33 | 0.71 | 28,620 |
| 3/13/2018 14:50 | 3/13/2018 19:30 | 4.7 | 0.26 | 0.06 | 0.12 | 116.8 | 3/13/2018 14:45 | 3/14/2018 6:10 | 15.5 | 0.18 | 0.31 | 9,945 |
| 3/14/2018 6:15 | 3/14/2018 9:35 | 3.3 | 0.04 | 0.01 | 0.12 | 11.8 | 3/14/2018 6:10 | 3/14/2018 21:30 | 15.4 | 0.15 | 0.16 | 8,160 |
| 3/21/2018 21:40 | 3/22/2018 21:55 | 24.3 | 0.50 | 0.02 | 0.24 | 183.4 | 3/21/2018 21:40 | 3/23/2018 6:20 | 32.8 | 0.16 | 0.29 | 18,933 |

Table D-5. Summary Statistics for Individual Storm Events at the MONMS Station.

| Precipitation Start Time | Precipitation Stop Time | Precipitation Duration (hour) | Precipitation Depth (inch) | Precipitation Average Intensity (inch/hour) | Precipitation Maximum Intensity (inch/hour) | Precipitation Antecedent Dry Period (hour) | Flow Start Time | Flow Stop Time | Flow Duration (hour) | Average Flow Rate (feet ³ /second) | Maximum Flow Rate (feet ³ /second) | Flow Volume (feet ³) |
|--------------------------|-------------------------|-------------------------------|----------------------------|---|---|--|-----------------|-----------------|----------------------|---|---|----------------------------------|
| 3/23/2018 6:20 | 3/23/2018 11:00 | 4.7 | 0.38 | 0.08 | 0.24 | 14.3 | 3/23/2018 6:20 | 3/23/2018 23:00 | 16.8 | 0.25 | 0.49 | 15,153 |
| 3/23/2018 23:35 | 3/24/2018 6:30 | 6.9 | 0.26 | 0.04 | 0.24 | 13.6 | 3/23/2018 23:35 | 3/24/2018 18:30 | 19.0 | 0.22 | 0.35 | 15,255 |
| 3/26/2018 4:40 | 3/26/2018 10:30 | 5.8 | 0.03 | 0.01 | 0.12 | 46.8 | 3/26/2018 4:40 | 3/26/2018 11:00 | 6.4 | 0.12 | 0.12 | 2,769 |
| 3/26/2018 11:05 | 3/26/2018 13:35 | 2.5 | 0.04 | 0.02 | 0.12 | 53.2 | 3/26/2018 11:00 | 3/27/2018 1:30 | 14.6 | 0.12 | 0.14 | 6,309 |
| 3/27/2018 10:05 | 3/28/2018 2:15 | 16.2 | 0.16 | 0.01 | 0.12 | 23.0 | 3/27/2018 10:05 | 3/28/2018 14:10 | 28.2 | 0.12 | 0.16 | 12,666 |
| 4/1/2018 7:20 | 4/2/2018 0:25 | 17.1 | 0.30 | 0.02 | 0.24 | 104.8 | 4/1/2018 7:15 | 4/2/2018 12:20 | 29.2 | 0.13 | 0.26 | 13,497 |

Table D-6. Summary Statistics for Individual Storm Events at the TOSMO Station.

| Precipitation Start Time | Precipitation Stop Time | Precipitation Duration (hour) | Precipitation Depth (inch) | Precipitation Average Intensity (inch/hour) | Precipitation Maximum Intensity (inch/hour) | Precipitation Antecedent Dry Period (hour) | Flow Start Time | Flow Stop Time | Flow Duration (hour) | Average Flow Rate (feet ³ /second) | Maximum Flow Rate (feet ³ /second) | Flow Volume (feet ³) |
|--------------------------|-------------------------|-------------------------------|----------------------------|---|---|--|------------------|------------------|----------------------|---|---|----------------------------------|
| 10/7/2017 14:15 | 10/7/2017 19:10 | 4.9 | 0.15 | 0.03 | 0.48 | 11.9 | 10/7/2017 14:10 | 10/8/2017 3:20 | 13.3 | 0.35 | 0.67 | 16,779 |
| 10/8/2017 3:20 | 10/8/2017 3:50 | 0.5 | 0.03 | 0.06 | 0.12 | 8.3 | 10/8/2017 3:20 | 10/8/2017 15:50 | 12.6 | 0.31 | 0.50 | 13,872 |
| 10/10/2017 11:35 | 10/10/2017 18:25 | 6.8 | 0.20 | 0.03 | 0.24 | 64.6 | 10/10/2017 11:35 | 10/11/2017 6:20 | 18.8 | 0.55 | 3.01 | 37,305 |
| 10/12/2017 9:05 | 10/12/2017 12:05 | 3.0 | 0.08 | 0.03 | 0.12 | 38.9 | 10/12/2017 9:00 | 10/12/2017 19:40 | 10.8 | 0.45 | 1.14 | 17,340 |
| 10/12/2017 19:45 | 10/13/2017 8:05 | 12.3 | 0.40 | 0.03 | 0.60 | 8.5 | 10/12/2017 19:40 | 10/13/2017 20:00 | 24.4 | 0.61 | 3.19 | 53,202 |
| 10/17/2017 6:50 | 10/17/2017 11:20 | 4.5 | 0.13 | 0.03 | 0.24 | 95.2 | 10/17/2017 6:45 | 10/17/2017 23:15 | 16.6 | 0.40 | 1.37 | 23,679 |
| 10/18/2017 9:05 | 10/20/2017 2:25 | 41.3 | 1.63 | 0.04 | 0.36 | 22.1 | 10/18/2017 9:00 | 10/20/2017 8:45 | 47.8 | 1.48 | 4.80 | 254,331 |
| 10/20/2017 8:50 | 10/20/2017 11:05 | 2.3 | 0.03 | 0.01 | 0.12 | 6.8 | 10/20/2017 8:45 | 10/20/2017 23:00 | 14.3 | 0.49 | 0.79 | 25,179 |
| 10/21/2017 2:40 | 10/22/2017 1:50 | 23.2 | 0.87 | 0.04 | 0.12 | 24.6 | 10/21/2017 2:35 | 10/22/2017 13:50 | 35.3 | 1.29 | 4.36 | 164,673 |
| 10/25/2017 14:35 | 10/25/2017 15:40 | 1.1 | 0.03 | 0.03 | 0.12 | 87.8 | 10/25/2017 14:35 | 10/26/2017 3:40 | 13.2 | 0.38 | 0.50 | 18,168 |
| 11/1/2017 4:50 | 11/1/2017 8:15 | 3.4 | 0.28 | 0.08 | 0.24 | 246.0 | 11/1/2017 4:50 | 11/1/2017 20:10 | 15.4 | 0.64 | 2.08 | 35,376 |
| 11/2/2017 9:10 | 11/2/2017 11:50 | 2.7 | 0.25 | 0.09 | 1.44 | 25.2 | 11/2/2017 9:10 | 11/2/2017 19:40 | 10.6 | 0.92 | 4.58 | 35,031 |
| 11/2/2017 19:45 | 11/2/2017 21:20 | 1.6 | 0.12 | 0.08 | 0.24 | 8.1 | 11/2/2017 19:40 | 11/3/2017 3:10 | 7.6 | 0.76 | 1.57 | 20,820 |
| 11/3/2017 3:10 | 11/3/2017 14:35 | 11.4 | 0.34 | 0.03 | 0.12 | 6.4 | 11/3/2017 3:10 | 11/4/2017 2:35 | 23.5 | 0.91 | 1.81 | 76,770 |
| 11/4/2017 12:25 | 11/5/2017 14:50 | 26.4 | 1.08 | 0.04 | 0.24 | 22.2 | 11/4/2017 12:20 | 11/6/2017 2:45 | 38.5 | 2.10 | 7.39 | 291,258 |
| 11/8/2017 16:20 | 11/8/2017 23:00 | 6.7 | 0.09 | 0.01 | 0.12 | 74.2 | 11/8/2017 16:15 | 11/9/2017 7:50 | 15.7 | 0.58 | 1.21 | 32,493 |
| 11/9/2017 7:50 | 11/9/2017 19:50 | 12.0 | 0.36 | 0.03 | 0.24 | 14.3 | 11/9/2017 7:50 | 11/10/2017 7:50 | 24.1 | 0.83 | 3.01 | 72,156 |
| 11/11/2017 7:25 | 11/11/2017 19:55 | 12.5 | 0.08 | 0.01 | 0.12 | 36.4 | 11/11/2017 7:25 | 11/11/2017 23:35 | 16.3 | 0.48 | 0.73 | 28,260 |
| 11/11/2017 23:35 | 11/12/2017 7:45 | 8.2 | 0.32 | 0.04 | 0.24 | 8.7 | 11/11/2017 23:35 | 11/12/2017 14:35 | 15.1 | 1.07 | 3.95 | 58,260 |
| 11/12/2017 14:35 | 11/13/2017 6:45 | 16.2 | 0.38 | 0.02 | 0.60 | 7.3 | 11/12/2017 14:35 | 11/13/2017 15:10 | 24.7 | 1.01 | 3.37 | 89,367 |
| 11/13/2017 15:15 | 11/13/2017 19:20 | 4.1 | 0.33 | 0.08 | 0.24 | 9.6 | 11/13/2017 15:10 | 11/14/2017 7:15 | 16.2 | 1.27 | 4.58 | 73,992 |
| 11/14/2017 22:25 | 11/15/2017 10:40 | 12.3 | 0.45 | 0.04 | 0.24 | 29.0 | 11/14/2017 22:25 | 11/15/2017 22:40 | 24.3 | 1.12 | 4.15 | 98,052 |
| 11/16/2017 3:05 | 11/16/2017 13:25 | 10.3 | 0.18 | 0.02 | 0.12 | 19.2 | 11/16/2017 3:00 | 11/17/2017 1:25 | 22.5 | 0.70 | 1.21 | 56,856 |
| 11/19/2017 14:50 | 11/20/2017 16:20 | 25.5 | 1.01 | 0.04 | 0.84 | 75.3 | 11/19/2017 14:45 | 11/21/2017 4:20 | 37.7 | 1.56 | 8.93 | 211,656 |
| 11/21/2017 4:55 | 11/22/2017 8:00 | 27.1 | 1.65 | 0.06 | 0.48 | 13.0 | 11/21/2017 4:50 | 11/22/2017 10:40 | 29.9 | 3.58 | 12.78 | 385,925 |
| 11/22/2017 10:40 | 11/22/2017 12:55 | 2.3 | 0.04 | 0.02 | 0.12 | 8.6 | 11/22/2017 10:40 | 11/22/2017 21:00 | 10.4 | 1.24 | 1.69 | 46,482 |
| 11/22/2017 21:05 | 11/23/2017 1:55 | 4.8 | 0.52 | 0.11 | 1.08 | 10.4 | 11/22/2017 21:00 | 11/23/2017 8:20 | 11.4 | 3.18 | 13.83 | 130,686 |
| 11/23/2017 8:20 | 11/23/2017 12:55 | 4.6 | 0.30 | 0.07 | 0.36 | 7.9 | 11/23/2017 8:20 | 11/24/2017 0:55 | 16.7 | 1.83 | 5.51 | 109,743 |
| 11/24/2017 15:55 | 11/24/2017 17:45 | 1.8 | 0.06 | 0.03 | 0.12 | 27.5 | 11/24/2017 15:55 | 11/25/2017 5:45 | 13.9 | 0.72 | 1.29 | 36,177 |
| 11/25/2017 15:40 | 11/25/2017 21:20 | 5.7 | 0.20 | 0.04 | 0.12 | 22.7 | 11/25/2017 15:40 | 11/26/2017 2:35 | 11.0 | 1.08 | 2.84 | 42,828 |
| 11/26/2017 2:40 | 11/26/2017 19:15 | 16.6 | 0.60 | 0.04 | 0.72 | 6.3 | 11/26/2017 2:35 | 11/27/2017 7:15 | 28.8 | 1.52 | 9.60 | 157,128 |
| 11/28/2017 5:50 | 11/28/2017 15:45 | 9.9 | 0.76 | 0.08 | 0.24 | 39.8 | 11/28/2017 5:50 | 11/29/2017 3:40 | 21.9 | 2.30 | 7.10 | 181,260 |
| 11/30/2017 6:25 | 11/30/2017 10:25 | 4.0 | 0.34 | 0.09 | 0.24 | 38.8 | 11/30/2017 6:20 | 11/30/2017 22:25 | 16.2 | 1.41 | 4.15 | 81,819 |
| 12/1/2017 14:45 | 12/1/2017 19:30 | 4.8 | 0.13 | 0.03 | 0.12 | 28.9 | 12/1/2017 14:45 | 12/2/2017 7:30 | 16.8 | 0.85 | 1.45 | 51,369 |
| 12/2/2017 9:10 | 12/3/2017 2:35 | 17.4 | 0.85 | 0.05 | 0.24 | 14.7 | 12/2/2017 9:10 | 12/3/2017 12:30 | 27.4 | 2.15 | 3.95 | 212,544 |
| 12/3/2017 12:35 | 12/3/2017 13:00 | 0.4 | 0.07 | 0.17 | 0.24 | 12.1 | 12/3/2017 12:30 | 12/4/2017 0:55 | 12.5 | 1.00 | 2.08 | 44,820 |
| 12/15/2017 21:10 | 12/15/2017 21:35 | 0.4 | 0.15 | 0.36 | 0.72 | 296.4 | 12/15/2017 21:10 | 12/16/2017 9:30 | 12.4 | 0.52 | 1.94 | 23,130 |
| 12/16/2017 20:35 | 12/16/2017 23:25 | 2.8 | 0.10 | 0.04 | 0.12 | 23.2 | 12/16/2017 20:35 | 12/17/2017 11:25 | 14.9 | 0.51 | 1.21 | 27,216 |
| 12/18/2017 5:35 | 12/19/2017 12:25 | 30.8 | 1.96 | 0.06 | 0.36 | 31.5 | 12/18/2017 5:35 | 12/20/2017 0:10 | 42.7 | 2.90 | 9.26 | 445,548 |
| 12/20/2017 0:10 | 12/20/2017 4:15 | 4.1 | 0.19 | 0.05 | 0.24 | 12.1 | 12/20/2017 0:10 | 12/20/2017 16:15 | 16.2 | 1.31 | 3.55 | 76,125 |
| 12/22/2017 0:15 | 12/22/2017 11:40 | 11.4 | 0.17 | 0.01 | 0.12 | 45.4 | 12/22/2017 0:10 | 12/22/2017 23:35 | 23.5 | 0.67 | 0.99 | 56,862 |
| 12/25/2017 12:00 | 12/25/2017 16:45 | 4.8 | 0.12 | 0.03 | 0.12 | 74.9 | 12/25/2017 11:55 | 12/26/2017 4:40 | 16.8 | 0.52 | 0.61 | 31,266 |
| 12/26/2017 10:25 | 12/26/2017 13:35 | 3.2 | 0.12 | 0.04 | 0.12 | 19.7 | 12/26/2017 10:25 | 12/27/2017 1:30 | 15.2 | 0.50 | 0.61 | 27,231 |
| 12/28/2017 5:10 | 12/28/2017 10:30 | 5.3 | 0.03 | 0.01 | 0.12 | 40.3 | 12/28/2017 5:10 | 12/28/2017 19:15 | 14.2 | 0.51 | 0.67 | 25,767 |

Table D-6. Summary Statistics for Individual Storm Events at the TOSMO Station.

| Precipitation Start Time | Precipitation Stop Time | Precipitation Duration (hour) | Precipitation Depth (inch) | Precipitation Average Intensity (inch/hour) | Precipitation Maximum Intensity (inch/hour) | Precipitation Antecedent Dry Period (hour) | Flow Start Time | Flow Stop Time | Flow Duration (hour) | Average Flow Rate (feet ³ /second) | Maximum Flow Rate (feet ³ /second) | Flow Volume (feet ³) |
|--------------------------|-------------------------|-------------------------------|----------------------------|---|---|--|------------------|-----------------|----------------------|---|---|----------------------------------|
| 12/28/2017 19:15 | 12/29/2017 13:50 | 18.6 | 1.48 | 0.08 | 0.24 | 54.4 | 12/28/2017 19:15 | 12/30/2017 1:50 | 30.7 | 3.62 | 9.90 | 399,357 |
| 1/4/2018 22:25 | 1/5/2018 17:30 | 19.1 | 0.40 | 0.02 | 0.24 | 153.3 | 1/4/2018 22:25 | 1/5/2018 23:25 | 25.1 | 0.92 | 2.68 | 83,001 |
| 1/5/2018 23:25 | 1/6/2018 13:45 | 14.3 | 0.49 | 0.03 | 0.24 | 10.2 | 1/5/2018 23:25 | 1/7/2018 1:40 | 26.3 | 1.31 | 3.19 | 123,942 |
| 1/7/2018 6:20 | 1/8/2018 1:50 | 19.5 | 0.58 | 0.03 | 0.12 | 18.2 | 1/7/2018 6:20 | 1/8/2018 13:50 | 31.6 | 1.44 | 3.19 | 163,464 |
| 1/8/2018 19:35 | 1/10/2018 3:00 | 31.4 | 1.16 | 0.04 | 0.48 | 21.2 | 1/8/2018 19:30 | 1/10/2018 13:40 | 42.3 | 2.26 | 8.93 | 343,962 |
| 1/10/2018 13:45 | 1/11/2018 13:15 | 23.5 | 1.02 | 0.04 | 0.36 | 16.4 | 1/10/2018 13:40 | 1/11/2018 20:55 | 31.3 | 2.73 | 11.45 | 308,418 |
| 1/11/2018 20:55 | 1/11/2018 23:55 | 3.0 | 0.14 | 0.05 | 0.12 | 8.2 | 1/11/2018 20:55 | 1/12/2018 11:55 | 15.1 | 1.74 | 3.95 | 94,209 |
| 1/12/2018 16:45 | 1/13/2018 2:05 | 9.3 | 0.20 | 0.02 | 0.12 | 17.9 | 1/12/2018 16:40 | 1/13/2018 14:00 | 21.4 | 1.08 | 2.84 | 83,640 |
| 1/15/2018 21:05 | 1/16/2018 5:55 | 8.8 | 0.23 | 0.03 | 0.12 | 72.3 | 1/15/2018 21:00 | 1/16/2018 17:55 | 21.0 | 0.79 | 1.69 | 59,871 |
| 1/17/2018 5:45 | 1/17/2018 7:15 | 1.5 | 0.03 | 0.02 | 0.12 | 24.4 | 1/17/2018 5:45 | 1/17/2018 14:45 | 9.1 | 0.53 | 0.67 | 17,274 |
| 1/17/2018 14:50 | 1/18/2018 5:35 | 14.8 | 1.22 | 0.08 | 0.60 | 33.5 | 1/17/2018 14:45 | 1/18/2018 14:10 | 23.5 | 3.14 | 9.60 | 265,572 |
| 1/18/2018 14:15 | 1/18/2018 20:05 | 5.8 | 0.21 | 0.04 | 0.36 | 9.0 | 1/18/2018 14:10 | 1/19/2018 8:00 | 17.9 | 1.54 | 5.03 | 99,132 |
| 1/19/2018 12:10 | 1/19/2018 14:35 | 2.4 | 0.03 | 0.01 | 0.12 | 19.9 | 1/19/2018 12:10 | 1/19/2018 21:40 | 9.6 | 0.78 | 0.92 | 26,994 |
| 1/19/2018 21:40 | 1/20/2018 16:20 | 18.7 | 0.09 | 0.00 | 0.12 | 29.4 | 1/19/2018 21:40 | 1/21/2018 4:15 | 30.7 | 0.67 | 0.99 | 73,974 |
| 1/21/2018 6:40 | 1/21/2018 11:40 | 5.0 | 0.08 | 0.02 | 0.12 | 27.3 | 1/21/2018 6:40 | 1/21/2018 15:10 | 8.6 | 0.76 | 1.29 | 23,382 |
| 1/21/2018 15:10 | 1/21/2018 19:00 | 3.8 | 0.16 | 0.04 | 0.36 | 7.2 | 1/21/2018 15:10 | 1/22/2018 0:55 | 9.8 | 0.95 | 3.19 | 33,702 |
| 1/22/2018 0:55 | 1/22/2018 5:30 | 4.6 | 0.13 | 0.03 | 0.24 | 8.1 | 1/22/2018 0:55 | 1/22/2018 17:30 | 16.7 | 0.75 | 1.69 | 44,961 |
| 1/23/2018 8:20 | 1/24/2018 2:45 | 18.4 | 0.86 | 0.05 | 0.36 | 27.2 | 1/23/2018 8:15 | 1/24/2018 7:30 | 23.3 | 2.08 | 6.28 | 174,699 |
| 1/24/2018 7:30 | 1/24/2018 23:50 | 16.3 | 0.42 | 0.03 | 0.24 | 6.8 | 1/24/2018 7:30 | 1/25/2018 10:05 | 26.7 | 1.54 | 4.36 | 147,627 |
| 1/25/2018 10:10 | 1/25/2018 18:55 | 8.8 | 0.12 | 0.01 | 0.12 | 14.9 | 1/25/2018 10:05 | 1/26/2018 6:55 | 20.9 | 0.88 | 1.57 | 66,495 |
| 1/26/2018 9:05 | 1/26/2018 11:45 | 2.7 | 0.03 | 0.01 | 0.12 | 20.4 | 1/26/2018 9:00 | 1/26/2018 18:00 | 9.1 | 0.67 | 0.73 | 21,819 |
| 1/26/2018 18:05 | 1/27/2018 11:15 | 17.2 | 0.53 | 0.03 | 0.24 | 29.4 | 1/26/2018 18:00 | 1/27/2018 23:10 | 29.3 | 1.32 | 4.36 | 138,555 |
| 1/27/2018 23:25 | 1/28/2018 7:10 | 7.8 | 0.11 | 0.01 | 0.24 | 13.4 | 1/27/2018 23:25 | 1/28/2018 19:05 | 19.8 | 0.81 | 1.69 | 57,714 |
| 1/29/2018 7:00 | 1/29/2018 16:45 | 9.8 | 0.82 | 0.08 | 0.36 | 30.8 | 1/29/2018 6:55 | 1/30/2018 4:40 | 21.8 | 2.44 | 8.93 | 191,781 |
| 2/1/2018 9:05 | 2/3/2018 2:15 | 41.2 | 0.88 | 0.02 | 0.24 | 64.8 | 2/1/2018 9:00 | 2/3/2018 14:05 | 53.2 | 1.25 | 3.95 | 239,099 |
| 2/3/2018 14:05 | 2/3/2018 23:55 | 9.8 | 0.61 | 0.06 | 0.24 | 22.3 | 2/3/2018 14:05 | 2/4/2018 5:15 | 15.3 | 2.24 | 5.76 | 122,838 |
| 2/4/2018 5:15 | 2/4/2018 12:10 | 6.9 | 0.06 | 0.01 | 0.12 | 7.5 | 2/4/2018 5:15 | 2/5/2018 0:10 | 19.0 | 1.03 | 1.45 | 70,224 |
| 2/5/2018 17:10 | 2/6/2018 1:40 | 8.5 | 0.21 | 0.02 | 0.12 | 33.8 | 2/5/2018 17:10 | 2/6/2018 13:40 | 20.6 | 0.86 | 1.57 | 63,600 |
| 2/8/2018 17:05 | 2/8/2018 19:25 | 2.3 | 0.23 | 0.10 | 0.36 | 65.5 | 2/8/2018 17:00 | 2/9/2018 7:25 | 14.5 | 0.81 | 2.84 | 42,510 |
| 2/13/2018 20:50 | 2/14/2018 13:10 | 16.3 | 0.46 | 0.03 | 0.24 | 122.2 | 2/13/2018 20:45 | 2/15/2018 1:05 | 28.4 | 0.81 | 1.94 | 83,169 |
| 2/15/2018 12:15 | 2/15/2018 12:40 | 0.4 | 0.03 | 0.07 | 0.24 | 24.7 | 2/15/2018 12:15 | 2/16/2018 0:40 | 12.5 | 0.47 | 0.85 | 21,135 |
| 2/16/2018 1:50 | 2/16/2018 6:30 | 4.7 | 0.22 | 0.05 | 0.12 | 38.2 | 2/16/2018 1:50 | 2/16/2018 14:00 | 12.3 | 0.82 | 1.94 | 36,324 |
| 2/16/2018 14:00 | 2/16/2018 18:00 | 4.0 | 0.04 | 0.01 | 0.12 | 10.1 | 2/16/2018 14:00 | 2/17/2018 0:30 | 10.6 | 0.51 | 0.61 | 19,293 |
| 2/17/2018 0:30 | 2/17/2018 10:25 | 9.9 | 0.20 | 0.02 | 0.24 | 10.5 | 2/17/2018 0:30 | 2/17/2018 22:25 | 22.0 | 0.72 | 1.81 | 56,628 |
| 2/22/2018 10:00 | 2/22/2018 10:25 | 0.4 | 0.04 | 0.10 | 0.24 | 121.2 | 2/22/2018 9:55 | 2/22/2018 22:25 | 12.6 | 0.33 | 0.37 | 14,727 |
| 2/24/2018 4:45 | 2/24/2018 8:50 | 4.1 | 0.12 | 0.03 | 0.12 | 42.8 | 2/24/2018 4:40 | 2/24/2018 20:45 | 16.2 | 0.50 | 1.14 | 29,130 |
| 2/25/2018 0:05 | 2/25/2018 4:45 | 4.7 | 0.04 | 0.01 | 0.12 | 15.6 | 2/25/2018 0:00 | 2/25/2018 11:10 | 11.3 | 0.37 | 0.50 | 14,880 |
| 2/25/2018 11:10 | 2/25/2018 12:00 | 0.8 | 0.06 | 0.07 | 0.12 | 11.1 | 2/25/2018 11:10 | 2/25/2018 23:55 | 12.8 | 0.51 | 0.79 | 23,706 |
| 2/26/2018 9:40 | 2/26/2018 16:00 | 6.3 | 0.59 | 0.09 | 0.24 | 22.3 | 2/26/2018 9:40 | 2/27/2018 3:55 | 18.3 | 0.90 | 1.81 | 59,610 |
| 2/27/2018 15:20 | 2/27/2018 21:15 | 5.9 | 0.22 | 0.04 | 0.12 | 23.8 | 2/27/2018 15:20 | 2/28/2018 9:10 | 17.9 | 1.02 | 2.22 | 65,562 |
| 2/28/2018 13:05 | 3/1/2018 1:40 | 12.6 | 0.40 | 0.03 | 0.12 | 16.2 | 2/28/2018 13:05 | 3/1/2018 13:40 | 24.7 | 1.13 | 2.37 | 100,602 |
| 3/2/2018 1:35 | 3/2/2018 6:05 | 4.5 | 0.23 | 0.05 | 0.24 | 27.4 | 3/2/2018 1:30 | 3/2/2018 18:00 | 16.6 | 0.93 | 2.37 | 55,308 |
| 3/4/2018 15:50 | 3/4/2018 17:40 | 1.8 | 0.12 | 0.07 | 0.48 | 58.6 | 3/4/2018 15:45 | 3/5/2018 5:35 | 13.9 | 0.60 | 2.22 | 30,003 |
| 3/5/2018 7:40 | 3/5/2018 8:25 | 0.8 | 0.04 | 0.05 | 0.12 | 15.7 | 3/5/2018 7:40 | 3/5/2018 20:25 | 12.8 | 0.49 | 0.73 | 22,527 |
| 3/7/2018 22:45 | 3/7/2018 23:35 | 0.8 | 0.05 | 0.06 | 0.12 | 63.1 | 3/7/2018 22:40 | 3/8/2018 7:25 | 8.8 | 0.46 | 0.85 | 14,622 |

Table D-6. Summary Statistics for Individual Storm Events at the TOSMO Station.

| Precipitation Start Time | Precipitation Stop Time | Precipitation Duration (hour) | Precipitation Depth (inch) | Precipitation Average Intensity (inch/hour) | Precipitation Maximum Intensity (inch/hour) | Precipitation Antecedent Dry Period (hour) | Flow Start Time | Flow Stop Time | Flow Duration (hour) | Average Flow Rate (feet ³ /second) | Maximum Flow Rate (feet ³ /second) | Flow Volume (feet ³) |
|--------------------------|-------------------------|-------------------------------|----------------------------|---|---|--|-----------------|-----------------|----------------------|---|---|----------------------------------|
| 3/8/2018 7:25 | 3/8/2018 20:10 | 12.8 | 0.48 | 0.04 | 0.24 | 8.5 | 3/8/2018 7:25 | 3/9/2018 8:10 | 24.8 | 0.97 | 3.01 | 87,087 |
| 3/13/2018 14:25 | 3/13/2018 19:00 | 4.6 | 0.24 | 0.05 | 0.12 | 115.2 | 3/13/2018 14:25 | 3/14/2018 5:20 | 15.0 | 0.74 | 2.08 | 39,780 |
| 3/14/2018 5:20 | 3/14/2018 9:45 | 4.4 | 0.06 | 0.01 | 0.12 | 10.8 | 3/14/2018 5:20 | 3/14/2018 21:40 | 16.4 | 0.45 | 0.79 | 26,553 |
| 3/21/2018 21:25 | 3/23/2018 15:30 | 42.1 | 0.95 | 0.02 | 0.36 | 183.2 | 3/21/2018 21:20 | 3/23/2018 23:30 | 50.3 | 0.92 | 5.27 | 166,767 |
| 3/23/2018 23:30 | 3/24/2018 6:00 | 6.5 | 0.23 | 0.04 | 0.12 | 13.2 | 3/23/2018 23:30 | 3/24/2018 18:00 | 18.6 | 0.82 | 2.84 | 54,597 |

Table D-7. Summary Statistics for Individual Storm Events at the TOSMI Station.

| Precipitation Start Time | Precipitation Stop Time | Precipitation Duration (hour) | Precipitation Depth (inch) | Precipitation Average Intensity (inch/hour) | Precipitation Maximum Intensity (inch/hour) | Precipitation Antecedent Dry Period (hour) | Flow Start Time | Flow Stop Time | Flow Duration (hour) | Average Flow Rate (feet ³ /second) | Maximum Flow Rate (feet ³ /second) | Flow Volume (feet ³) |
|--------------------------|-------------------------|-------------------------------|----------------------------|---|---|--|------------------|------------------|----------------------|---|---|----------------------------------|
| 10/7/2017 14:15 | 10/7/2017 19:10 | 4.9 | 0.15 | 0.03 | 0.48 | 11.9 | 10/7/2017 14:10 | 10/8/2017 3:20 | 13.3 | 0.13 | 0.54 | 6,210 |
| 10/8/2017 3:20 | 10/8/2017 3:50 | 0.5 | 0.03 | 0.06 | 0.12 | 8.3 | 10/8/2017 3:20 | 10/8/2017 15:50 | 12.6 | 0.10 | 0.31 | 4,311 |
| 10/10/2017 11:35 | 10/10/2017 18:25 | 6.8 | 0.20 | 0.03 | 0.24 | 64.6 | 10/10/2017 11:35 | 10/11/2017 6:20 | 18.8 | 0.41 | 4.46 | 27,861 |
| 10/12/2017 9:05 | 10/12/2017 12:05 | 3.0 | 0.08 | 0.03 | 0.12 | 38.9 | 10/12/2017 9:00 | 10/12/2017 19:40 | 10.8 | 0.37 | 0.97 | 14,166 |
| 10/12/2017 19:45 | 10/13/2017 8:05 | 12.3 | 0.40 | 0.03 | 0.60 | 8.5 | 10/12/2017 19:40 | 10/13/2017 20:00 | 24.4 | 0.61 | 3.67 | 53,670 |
| 10/17/2017 6:50 | 10/17/2017 11:20 | 4.5 | 0.13 | 0.03 | 0.24 | 95.2 | 10/17/2017 6:45 | 10/17/2017 23:15 | 16.6 | 0.39 | 1.57 | 23,136 |
| 10/18/2017 9:05 | 10/20/2017 2:25 | 41.3 | 1.63 | 0.04 | 0.36 | 22.1 | 10/18/2017 9:00 | 10/20/2017 8:45 | 47.8 | 1.36 | 5.35 | 233,607 |
| 10/20/2017 8:50 | 10/20/2017 11:05 | 2.3 | 0.03 | 0.01 | 0.12 | 6.8 | 10/20/2017 8:45 | 10/20/2017 23:00 | 14.3 | 0.29 | 0.62 | 14,772 |
| 10/21/2017 2:40 | 10/22/2017 1:50 | 23.2 | 0.87 | 0.04 | 0.12 | 24.6 | 10/21/2017 2:35 | 10/22/2017 13:50 | 35.3 | 0.98 | 3.92 | 124,911 |
| 10/25/2017 14:35 | 10/25/2017 15:40 | 1.1 | 0.03 | 0.03 | 0.12 | 87.8 | 10/25/2017 14:35 | 10/26/2017 3:40 | 13.2 | 0.12 | 0.15 | 5,922 |
| 11/1/2017 4:50 | 11/1/2017 8:15 | 3.4 | 0.28 | 0.08 | 0.24 | 246.0 | 11/1/2017 4:50 | 11/1/2017 20:10 | 15.4 | 0.33 | 1.87 | 18,519 |
| 11/2/2017 9:10 | 11/2/2017 11:50 | 2.7 | 0.25 | 0.09 | 1.44 | 25.2 | 11/2/2017 9:10 | 11/2/2017 19:40 | 10.6 | 0.52 | 3.92 | 19,803 |
| 11/2/2017 19:45 | 11/2/2017 21:20 | 1.6 | 0.12 | 0.08 | 0.24 | 8.1 | 11/2/2017 19:40 | 11/3/2017 3:10 | 7.6 | 0.43 | 1.31 | 11,667 |
| 11/3/2017 3:10 | 11/3/2017 14:35 | 11.4 | 0.34 | 0.03 | 0.12 | 6.4 | 11/3/2017 3:10 | 11/4/2017 2:35 | 23.5 | 0.57 | 1.31 | 47,862 |
| 11/4/2017 12:25 | 11/5/2017 14:50 | 26.4 | 1.08 | 0.04 | 0.24 | 22.2 | 11/4/2017 12:20 | 11/6/2017 2:45 | 38.5 | 1.43 | 4.74 | 198,468 |
| 11/8/2017 16:20 | 11/8/2017 23:00 | 6.7 | 0.09 | 0.01 | 0.12 | 74.2 | 11/8/2017 16:15 | 11/9/2017 7:50 | 15.7 | 0.29 | 1.08 | 16,605 |
| 11/9/2017 7:50 | 11/9/2017 19:50 | 12.0 | 0.36 | 0.03 | 0.24 | 14.3 | 11/9/2017 7:50 | 11/10/2017 7:50 | 24.1 | 0.54 | 2.03 | 46,977 |
| 11/11/2017 7:25 | 11/11/2017 19:55 | 12.5 | 0.08 | 0.01 | 0.12 | 36.4 | 11/11/2017 7:25 | 11/11/2017 23:35 | 16.3 | 0.19 | 0.48 | 11,373 |
| 11/11/2017 23:35 | 11/12/2017 7:45 | 8.2 | 0.32 | 0.04 | 0.24 | 8.7 | 11/11/2017 23:35 | 11/12/2017 14:35 | 15.1 | 0.69 | 2.77 | 37,686 |
| 11/12/2017 14:35 | 11/13/2017 6:45 | 16.2 | 0.38 | 0.02 | 0.60 | 7.3 | 11/12/2017 14:35 | 11/13/2017 15:10 | 24.7 | 0.69 | 2.77 | 60,831 |
| 11/13/2017 15:15 | 11/13/2017 19:20 | 4.1 | 0.33 | 0.08 | 0.24 | 9.6 | 11/13/2017 15:10 | 11/14/2017 7:15 | 16.2 | 0.96 | 3.92 | 55,617 |
| 11/14/2017 22:25 | 11/15/2017 10:40 | 12.3 | 0.45 | 0.04 | 0.24 | 29.0 | 11/14/2017 22:25 | 11/15/2017 22:40 | 24.3 | 0.81 | 3.43 | 70,998 |
| 11/16/2017 3:05 | 11/16/2017 13:25 | 10.3 | 0.18 | 0.02 | 0.12 | 19.2 | 11/16/2017 3:00 | 11/17/2017 1:25 | 22.5 | 0.43 | 0.97 | 34,632 |
| 11/19/2017 14:50 | 11/20/2017 16:20 | 25.5 | 1.01 | 0.04 | 0.84 | 75.3 | 11/19/2017 14:45 | 11/21/2017 4:20 | 37.7 | 1.21 | 7.71 | 164,706 |
| 11/21/2017 4:55 | 11/22/2017 8:00 | 27.1 | 1.65 | 0.06 | 0.48 | 13.0 | 11/21/2017 4:50 | 11/22/2017 10:40 | 29.9 | 2.64 | 10.37 | 284,724 |
| 11/22/2017 10:40 | 11/22/2017 12:55 | 2.3 | 0.04 | 0.02 | 0.12 | 8.6 | 11/22/2017 10:40 | 11/22/2017 21:00 | 10.4 | 0.99 | 1.44 | 37,245 |
| 11/22/2017 21:05 | 11/23/2017 1:55 | 4.8 | 0.52 | 0.11 | 1.08 | 10.4 | 11/22/2017 21:00 | 11/23/2017 8:20 | 11.4 | 2.10 | 11.42 | 86,163 |
| 11/23/2017 8:20 | 11/23/2017 12:55 | 4.6 | 0.30 | 0.07 | 0.36 | 7.9 | 11/23/2017 8:20 | 11/24/2017 0:55 | 16.7 | 1.08 | 3.22 | 64,950 |
| 11/24/2017 15:55 | 11/24/2017 17:45 | 1.8 | 0.06 | 0.03 | 0.12 | 27.5 | 11/24/2017 15:55 | 11/25/2017 5:45 | 13.9 | 0.46 | 0.89 | 23,238 |
| 11/25/2017 15:40 | 11/25/2017 21:20 | 5.7 | 0.20 | 0.04 | 0.12 | 22.7 | 11/25/2017 15:40 | 11/26/2017 2:35 | 11.0 | 0.71 | 1.90 | 28,197 |
| 11/26/2017 2:40 | 11/26/2017 19:15 | 16.6 | 0.60 | 0.04 | 0.72 | 6.3 | 11/26/2017 2:35 | 11/27/2017 7:15 | 28.8 | 1.04 | 7.49 | 107,352 |
| 11/28/2017 5:50 | 11/28/2017 15:45 | 9.9 | 0.76 | 0.08 | 0.24 | 39.8 | 11/28/2017 5:50 | 11/29/2017 3:40 | 21.9 | 1.60 | 5.35 | 126,126 |
| 11/30/2017 6:25 | 11/30/2017 10:25 | 4.0 | 0.34 | 0.09 | 0.24 | 38.8 | 11/30/2017 6:20 | 11/30/2017 22:25 | 16.2 | 0.94 | 2.80 | 54,651 |
| 12/1/2017 14:45 | 12/1/2017 19:30 | 4.8 | 0.13 | 0.03 | 0.12 | 28.9 | 12/1/2017 14:45 | 12/2/2017 7:30 | 16.8 | 0.55 | 1.10 | 33,306 |
| 12/2/2017 9:10 | 12/3/2017 2:35 | 17.4 | 0.85 | 0.05 | 0.24 | 14.7 | 12/2/2017 9:10 | 12/3/2017 12:30 | 27.4 | 1.41 | 2.60 | 139,248 |
| 12/3/2017 12:35 | 12/3/2017 13:00 | 0.4 | 0.07 | 0.17 | 0.24 | 12.1 | 12/3/2017 12:30 | 12/4/2017 0:55 | 12.5 | 0.66 | 1.33 | 29,865 |
| 12/15/2017 21:10 | 12/15/2017 21:35 | 0.4 | 0.15 | 0.36 | 0.72 | 296.4 | 12/15/2017 21:10 | 12/16/2017 9:30 | 12.4 | 0.46 | 1.74 | 20,616 |
| 12/16/2017 20:35 | 12/16/2017 23:25 | 2.8 | 0.10 | 0.04 | 0.12 | 23.2 | 12/16/2017 20:35 | 12/17/2017 11:25 | 14.9 | 0.46 | 1.21 | 24,735 |
| 12/18/2017 5:35 | 12/19/2017 12:25 | 30.8 | 1.96 | 0.06 | 0.36 | 31.5 | 12/18/2017 5:35 | 12/20/2017 0:10 | 42.7 | 2.41 | 7.49 | 370,772 |
| 12/20/2017 0:10 | 12/20/2017 4:15 | 4.1 | 0.19 | 0.05 | 0.24 | 12.1 | 12/20/2017 0:10 | 12/20/2017 16:15 | 16.2 | 0.97 | 2.80 | 56,643 |
| 12/22/2017 0:15 | 12/22/2017 11:40 | 11.4 | 0.17 | 0.01 | 0.12 | 45.4 | 12/22/2017 0:10 | 12/22/2017 23:35 | 23.5 | 0.59 | 0.99 | 49,896 |
| 12/25/2017 12:00 | 12/25/2017 16:45 | 4.8 | 0.12 | 0.03 | 0.12 | 74.9 | 12/25/2017 11:55 | 12/26/2017 4:40 | 16.8 | 0.44 | 0.56 | 26,559 |
| 12/26/2017 10:25 | 12/26/2017 13:35 | 3.2 | 0.12 | 0.04 | 0.12 | 19.7 | 12/26/2017 10:25 | 12/27/2017 1:30 | 15.2 | 0.41 | 0.50 | 22,434 |

Table D-7. Summary Statistics for Individual Storm Events at the TOSMI Station.

| Precipitation Start Time | Precipitation Stop Time | Precipitation Duration (hour) | Precipitation Depth (inch) | Precipitation Average Intensity (inch/hour) | Precipitation Maximum Intensity (inch/hour) | Precipitation Antecedent Dry Period (hour) | Flow Start Time | Flow Stop Time | Flow Duration (hour) | Average Flow Rate (feet ³ /second) | Maximum Flow Rate (feet ³ /second) | Flow Volume (feet ³) |
|--------------------------|-------------------------|-------------------------------|----------------------------|---|---|--|------------------|------------------|----------------------|---|---|----------------------------------|
| 12/28/2017 5:10 | 12/28/2017 10:30 | 5.3 | 0.03 | 0.01 | 0.12 | 40.3 | 12/28/2017 5:10 | 12/28/2017 19:15 | 14.2 | 0.40 | 0.56 | 20,448 |
| 12/28/2017 19:15 | 12/29/2017 13:50 | 18.6 | 1.48 | 0.08 | 0.24 | 54.4 | 12/28/2017 19:15 | 12/30/2017 1:50 | 30.7 | 2.88 | 8.17 | 317,571 |
| 1/4/2018 22:25 | 1/5/2018 17:30 | 19.1 | 0.40 | 0.02 | 0.24 | 153.3 | 1/4/2018 22:25 | 1/5/2018 23:25 | 25.1 | 0.78 | 2.60 | 70,698 |
| 1/5/2018 23:25 | 1/6/2018 13:45 | 14.3 | 0.49 | 0.03 | 0.24 | 10.2 | 1/5/2018 23:25 | 1/7/2018 1:40 | 26.3 | 1.16 | 3.01 | 109,860 |
| 1/7/2018 6:20 | 1/8/2018 1:50 | 19.5 | 0.58 | 0.03 | 0.12 | 18.2 | 1/7/2018 6:20 | 1/8/2018 13:50 | 31.6 | 1.26 | 2.80 | 143,613 |
| 1/8/2018 19:35 | 1/10/2018 3:00 | 31.4 | 1.16 | 0.04 | 0.48 | 21.2 | 1/8/2018 19:30 | 1/10/2018 13:40 | 42.3 | 1.89 | 7.71 | 287,976 |
| 1/10/2018 13:45 | 1/11/2018 13:15 | 23.5 | 1.02 | 0.04 | 0.36 | 16.4 | 1/10/2018 13:40 | 1/11/2018 20:55 | 31.3 | 2.27 | 9.86 | 256,599 |
| 1/11/2018 20:55 | 1/11/2018 23:55 | 3.0 | 0.14 | 0.05 | 0.12 | 8.2 | 1/11/2018 20:55 | 1/12/2018 11:55 | 15.1 | 1.40 | 3.22 | 75,780 |
| 1/12/2018 16:45 | 1/13/2018 2:05 | 9.3 | 0.20 | 0.02 | 0.12 | 17.9 | 1/12/2018 16:40 | 1/13/2018 14:00 | 21.4 | 0.96 | 2.41 | 74,349 |
| 1/15/2018 21:05 | 1/16/2018 5:55 | 8.8 | 0.23 | 0.03 | 0.12 | 72.3 | 1/15/2018 21:00 | 1/16/2018 17:55 | 21.0 | 0.75 | 1.60 | 56,745 |
| 1/17/2018 5:45 | 1/17/2018 7:15 | 1.5 | 0.03 | 0.02 | 0.12 | 24.4 | 1/17/2018 5:45 | 1/17/2018 14:45 | 9.1 | 0.48 | 0.61 | 15,693 |
| 1/17/2018 14:50 | 1/18/2018 5:35 | 14.8 | 1.22 | 0.08 | 0.60 | 33.5 | 1/17/2018 14:45 | 1/18/2018 14:10 | 23.5 | 2.75 | 8.64 | 232,515 |
| 1/18/2018 14:15 | 1/18/2018 20:05 | 5.8 | 0.21 | 0.04 | 0.36 | 9.0 | 1/18/2018 14:10 | 1/19/2018 8:00 | 17.9 | 1.30 | 5.05 | 84,000 |
| 1/19/2018 12:10 | 1/19/2018 14:35 | 2.4 | 0.03 | 0.01 | 0.12 | 19.9 | 1/19/2018 12:10 | 1/19/2018 21:40 | 9.6 | 0.67 | 0.80 | 23,229 |
| 1/19/2018 21:40 | 1/20/2018 16:20 | 18.7 | 0.09 | 0.00 | 0.12 | 29.4 | 1/19/2018 21:40 | 1/21/2018 4:15 | 30.7 | 0.57 | 0.99 | 63,468 |
| 1/21/2018 6:40 | 1/21/2018 11:40 | 5.0 | 0.08 | 0.02 | 0.12 | 27.3 | 1/21/2018 6:40 | 1/21/2018 15:10 | 8.6 | 0.67 | 1.21 | 20,712 |
| 1/21/2018 15:10 | 1/21/2018 19:00 | 3.8 | 0.16 | 0.04 | 0.36 | 7.2 | 1/21/2018 15:10 | 1/22/2018 0:55 | 9.8 | 0.85 | 3.22 | 30,225 |
| 1/22/2018 0:55 | 1/22/2018 5:30 | 4.6 | 0.13 | 0.03 | 0.24 | 8.1 | 1/22/2018 0:55 | 1/22/2018 17:30 | 16.7 | 0.65 | 1.60 | 38,730 |
| 1/23/2018 8:20 | 1/24/2018 2:45 | 18.4 | 0.86 | 0.05 | 0.36 | 27.2 | 1/23/2018 8:15 | 1/24/2018 7:30 | 23.3 | 1.82 | 5.67 | 152,889 |
| 1/24/2018 7:30 | 1/24/2018 23:50 | 16.3 | 0.42 | 0.03 | 0.24 | 6.8 | 1/24/2018 7:30 | 1/25/2018 10:05 | 26.7 | 1.32 | 3.94 | 127,023 |
| 1/25/2018 10:10 | 1/25/2018 18:55 | 8.8 | 0.12 | 0.01 | 0.12 | 14.9 | 1/25/2018 10:05 | 1/26/2018 6:55 | 20.9 | 0.79 | 1.46 | 59,172 |
| 1/26/2018 9:05 | 1/26/2018 11:45 | 2.7 | 0.03 | 0.01 | 0.12 | 20.4 | 1/26/2018 9:00 | 1/26/2018 18:00 | 9.1 | 0.59 | 0.67 | 19,221 |
| 1/26/2018 18:05 | 1/27/2018 11:15 | 17.2 | 0.53 | 0.03 | 0.24 | 29.4 | 1/26/2018 18:00 | 1/27/2018 23:10 | 29.3 | 1.25 | 4.20 | 132,081 |
| 1/27/2018 23:25 | 1/28/2018 7:10 | 7.8 | 0.11 | 0.01 | 0.24 | 13.4 | 1/27/2018 23:25 | 1/28/2018 19:05 | 19.8 | 0.77 | 1.74 | 54,615 |
| 1/29/2018 7:00 | 1/29/2018 16:45 | 9.8 | 0.82 | 0.08 | 0.36 | 30.8 | 1/29/2018 6:55 | 1/30/2018 4:40 | 21.8 | 2.05 | 7.49 | 161,199 |
| 2/1/2018 9:05 | 2/3/2018 2:15 | 41.2 | 0.88 | 0.02 | 0.24 | 64.8 | 2/1/2018 9:00 | 2/3/2018 14:05 | 53.2 | 0.85 | 3.22 | 163,587 |
| 2/3/2018 14:05 | 2/3/2018 23:55 | 9.8 | 0.61 | 0.06 | 0.24 | 22.3 | 2/3/2018 14:05 | 2/4/2018 5:15 | 15.3 | 1.53 | 4.75 | 84,219 |
| 2/4/2018 5:15 | 2/4/2018 12:10 | 6.9 | 0.06 | 0.01 | 0.12 | 7.5 | 2/4/2018 5:15 | 2/5/2018 0:10 | 19.0 | 0.67 | 0.99 | 45,903 |
| 2/5/2018 17:10 | 2/6/2018 1:40 | 8.5 | 0.21 | 0.02 | 0.12 | 33.8 | 2/5/2018 17:10 | 2/6/2018 13:40 | 20.6 | 0.56 | 0.99 | 41,154 |
| 2/8/2018 17:05 | 2/8/2018 19:25 | 2.3 | 0.23 | 0.10 | 0.36 | 65.5 | 2/8/2018 17:00 | 2/9/2018 7:25 | 14.5 | 0.52 | 2.23 | 27,315 |
| 2/13/2018 20:50 | 2/14/2018 13:10 | 16.3 | 0.46 | 0.03 | 0.24 | 122.2 | 2/13/2018 20:45 | 2/15/2018 1:05 | 28.4 | 0.58 | 1.33 | 59,310 |
| 2/15/2018 12:15 | 2/15/2018 12:40 | 0.4 | 0.03 | 0.07 | 0.24 | 24.7 | 2/15/2018 12:15 | 2/16/2018 0:40 | 12.5 | 0.31 | 0.73 | 14,049 |
| 2/16/2018 1:50 | 2/16/2018 6:30 | 4.7 | 0.22 | 0.05 | 0.12 | 38.2 | 2/16/2018 1:50 | 2/16/2018 14:00 | 12.3 | 0.61 | 1.46 | 26,775 |
| 2/16/2018 14:00 | 2/16/2018 18:00 | 4.0 | 0.04 | 0.01 | 0.12 | 10.1 | 2/16/2018 14:00 | 2/17/2018 0:30 | 10.6 | 0.33 | 0.45 | 12,426 |
| 2/17/2018 0:30 | 2/17/2018 10:25 | 9.9 | 0.20 | 0.02 | 0.24 | 10.5 | 2/17/2018 0:30 | 2/17/2018 22:25 | 22.0 | 0.52 | 1.33 | 41,412 |
| 2/22/2018 10:00 | 2/22/2018 10:25 | 0.4 | 0.04 | 0.10 | 0.24 | 121.2 | 2/22/2018 9:55 | 2/22/2018 22:25 | 12.6 | 0.23 | 0.24 | 10,350 |
| 2/24/2018 4:45 | 2/24/2018 8:50 | 4.1 | 0.12 | 0.03 | 0.12 | 42.8 | 2/24/2018 4:40 | 2/24/2018 20:45 | 16.2 | 0.33 | 0.80 | 18,978 |
| 2/25/2018 0:05 | 2/25/2018 4:45 | 4.7 | 0.04 | 0.01 | 0.12 | 15.6 | 2/25/2018 0:00 | 2/25/2018 11:10 | 11.3 | 0.22 | 0.32 | 8,844 |
| 2/25/2018 11:10 | 2/25/2018 12:00 | 0.8 | 0.06 | 0.07 | 0.12 | 11.1 | 2/25/2018 11:10 | 2/25/2018 23:55 | 12.8 | 0.32 | 0.56 | 14,634 |
| 2/26/2018 9:40 | 2/26/2018 16:00 | 6.3 | 0.59 | 0.09 | 0.24 | 22.3 | 2/26/2018 9:40 | 2/27/2018 3:55 | 18.3 | 0.59 | 1.10 | 39,165 |
| 2/27/2018 15:20 | 2/27/2018 21:15 | 5.9 | 0.22 | 0.04 | 0.12 | 23.8 | 2/27/2018 15:20 | 2/28/2018 9:10 | 17.9 | 0.63 | 1.46 | 40,482 |
| 2/28/2018 13:05 | 3/1/2018 1:40 | 12.6 | 0.40 | 0.03 | 0.12 | 16.2 | 2/28/2018 13:05 | 3/1/2018 13:40 | 24.7 | 0.70 | 1.46 | 62,307 |
| 3/2/2018 1:35 | 3/2/2018 6:05 | 4.5 | 0.23 | 0.05 | 0.24 | 27.4 | 3/2/2018 1:30 | 3/2/2018 18:00 | 16.6 | 0.57 | 1.60 | 34,143 |
| 3/4/2018 15:50 | 3/4/2018 17:40 | 1.8 | 0.12 | 0.07 | 0.48 | 58.6 | 3/4/2018 15:45 | 3/5/2018 5:35 | 13.9 | 0.34 | 1.74 | 17,229 |

Table D-7. Summary Statistics for Individual Storm Events at the TOSMI Station.

| Precipitation Start Time | Precipitation Stop Time | Precipitation Duration (hour) | Precipitation Depth (inch) | Precipitation Average Intensity (inch/hour) | Precipitation Maximum Intensity (inch/hour) | Precipitation Antecedent Dry Period (hour) | Flow Start Time | Flow Stop Time | Flow Duration (hour) | Average Flow Rate (feet ³ /second) | Maximum Flow Rate (feet ³ /second) | Flow Volume (feet ³) |
|--------------------------|-------------------------|-------------------------------|----------------------------|---|---|--|-----------------|-----------------|----------------------|---|---|----------------------------------|
| 3/5/2018 7:40 | 3/5/2018 8:25 | 0.8 | 0.04 | 0.05 | 0.12 | 15.7 | 3/5/2018 7:40 | 3/5/2018 20:25 | 12.8 | 0.27 | 0.50 | 12,582 |
| 3/7/2018 22:45 | 3/7/2018 23:35 | 0.8 | 0.05 | 0.06 | 0.12 | 63.1 | 3/7/2018 22:40 | 3/8/2018 7:25 | 8.8 | 0.29 | 0.67 | 9,234 |
| 3/8/2018 7:25 | 3/8/2018 20:10 | 12.8 | 0.48 | 0.04 | 0.24 | 8.5 | 3/8/2018 7:25 | 3/9/2018 8:10 | 24.8 | 0.66 | 2.23 | 59,022 |
| 3/13/2018 14:25 | 3/13/2018 19:00 | 4.6 | 0.24 | 0.05 | 0.12 | 115.2 | 3/13/2018 14:25 | 3/14/2018 5:20 | 15.0 | 0.50 | 1.46 | 27,117 |
| 3/14/2018 5:20 | 3/14/2018 9:45 | 4.4 | 0.06 | 0.01 | 0.12 | 10.8 | 3/14/2018 5:20 | 3/14/2018 21:40 | 16.4 | 0.30 | 0.61 | 18,009 |
| 3/21/2018 21:25 | 3/23/2018 15:30 | 42.1 | 0.95 | 0.02 | 0.36 | 183.2 | 3/21/2018 21:20 | 3/23/2018 23:30 | 50.3 | 0.61 | 4.75 | 109,518 |
| 3/23/2018 23:30 | 3/24/2018 6:00 | 6.5 | 0.23 | 0.04 | 0.12 | 13.2 | 3/23/2018 23:30 | 3/24/2018 18:00 | 18.6 | 0.53 | 1.90 | 35,685 |

Table D-8. Summary Statistics for Individual Storm Events at the COLM Station.

| Precipitation Start Time | Precipitation Stop Time | Precipitation Duration (hour) | Precipitation Depth (inch) | Precipitation Average Intensity (inch/hour) | Precipitation Maximum Intensity (inch/hour) | Precipitation Antecedent Dry Period (hour) | Flow Start Time | Flow Stop Time | Flow Duration (hour) | Average Flow Rate (feet ³ /second) | Maximum Flow Rate (feet ³ /second) | Flow Volume (feet ³) |
|--------------------------|-------------------------|-------------------------------|----------------------------|---|---|--|------------------|------------------|----------------------|---|---|----------------------------------|
| 10/7/2017 13:55 | 10/8/2017 5:05 | 15.2 | 0.80 | 0.05 | 0.96 | 13.0 | 10/7/2017 17:15 | 10/8/2017 8:55 | 4.8 | 0.01 | 0.02 | 195 |
| 10/12/2017 22:50 | 10/13/2017 11:40 | 12.8 | 0.76 | 0.06 | 0.48 | 9.8 | 10/13/2017 0:20 | 10/13/2017 23:40 | 23.4 | 0.03 | 0.15 | 2,895 |
| 10/17/2017 7:00 | 10/17/2017 17:05 | 10.1 | 0.27 | 0.03 | 0.36 | 95.9 | 10/17/2017 8:25 | 10/18/2017 5:00 | 20.7 | 0.01 | 0.03 | 879 |
| 10/18/2017 9:15 | 10/20/2017 11:35 | 50.3 | 1.89 | 0.04 | 0.48 | 22.7 | 10/18/2017 9:10 | 10/20/2017 23:35 | 62.5 | 0.18 | 0.30 | 39,852 |
| 10/21/2017 2:35 | 10/21/2017 23:45 | 21.2 | 0.86 | 0.04 | 0.24 | 19.8 | 10/21/2017 2:35 | 10/22/2017 11:45 | 33.3 | 0.35 | 0.50 | 42,129 |
| 10/25/2017 14:35 | 10/25/2017 17:30 | 2.9 | 0.04 | 0.01 | 0.12 | 88.8 | 10/25/2017 14:35 | 10/26/2017 5:25 | 14.9 | 0.29 | 0.30 | 15,687 |
| 11/1/2017 6:35 | 11/1/2017 16:50 | 10.3 | 0.14 | 0.01 | 0.24 | 160.0 | 11/1/2017 6:30 | 11/2/2017 4:50 | 22.4 | 0.20 | 0.21 | 16,299 |
| 11/2/2017 9:05 | 11/2/2017 12:00 | 2.9 | 0.17 | 0.06 | 0.60 | 24.8 | 11/2/2017 9:00 | 11/2/2017 20:00 | 11.1 | 0.26 | 0.27 | 10,317 |
| 11/2/2017 20:00 | 11/3/2017 3:10 | 7.2 | 0.17 | 0.02 | 0.24 | 8.2 | 11/2/2017 20:00 | 11/3/2017 3:40 | 7.8 | 0.30 | 0.32 | 8,349 |
| 11/3/2017 3:40 | 11/3/2017 14:55 | 11.3 | 0.29 | 0.03 | 0.12 | 6.4 | 11/3/2017 3:40 | 11/4/2017 2:55 | 23.3 | 0.36 | 0.37 | 30,252 |
| 11/4/2017 13:00 | 11/5/2017 18:25 | 29.4 | 1.22 | 0.04 | 0.24 | 22.4 | 11/4/2017 12:55 | 11/6/2017 6:20 | 41.5 | 0.56 | 0.94 | 84,330 |
| 11/8/2017 16:55 | 11/8/2017 20:15 | 3.3 | 0.08 | 0.02 | 0.12 | 72.7 | 11/8/2017 16:50 | 11/9/2017 6:40 | 13.9 | 0.52 | 0.53 | 26,211 |
| 11/9/2017 6:40 | 11/10/2017 1:40 | 19.0 | 0.42 | 0.02 | 0.36 | 12.9 | 11/9/2017 6:40 | 11/10/2017 13:40 | 31.1 | 0.63 | 0.73 | 70,269 |
| 11/11/2017 9:10 | 11/11/2017 16:25 | 7.3 | 0.09 | 0.01 | 0.12 | 37.1 | 11/11/2017 9:10 | 11/11/2017 23:55 | 14.8 | 0.53 | 0.57 | 28,446 |
| 11/11/2017 23:55 | 11/12/2017 8:00 | 8.1 | 0.38 | 0.05 | 0.24 | 8.8 | 11/11/2017 23:55 | 11/12/2017 14:45 | 14.9 | 0.65 | 0.78 | 34,707 |
| 11/12/2017 14:45 | 11/13/2017 7:45 | 17.0 | 0.40 | 0.02 | 0.36 | 7.3 | 11/12/2017 14:45 | 11/13/2017 15:30 | 24.8 | 0.89 | 0.99 | 79,623 |
| 11/13/2017 15:35 | 11/13/2017 18:05 | 2.5 | 0.22 | 0.09 | 0.24 | 8.9 | 11/13/2017 15:30 | 11/14/2017 6:00 | 14.6 | 1.07 | 1.18 | 56,382 |
| 11/14/2017 22:15 | 11/15/2017 11:10 | 12.9 | 0.53 | 0.04 | 0.24 | 29.1 | 11/14/2017 22:15 | 11/15/2017 23:10 | 25.0 | 1.10 | 1.39 | 99,429 |
| 11/16/2017 2:05 | 11/16/2017 14:05 | 12.0 | 0.20 | 0.02 | 0.12 | 17.8 | 11/16/2017 2:00 | 11/17/2017 2:05 | 24.2 | 1.03 | 1.11 | 89,253 |
| 11/19/2017 15:55 | 11/20/2017 17:05 | 25.2 | 0.98 | 0.04 | 1.08 | 76.1 | 11/19/2017 15:55 | 11/21/2017 5:00 | 37.2 | 0.88 | 1.54 | 117,873 |
| 11/21/2017 5:05 | 11/22/2017 8:10 | 27.1 | 1.68 | 0.06 | 0.36 | 12.8 | 11/21/2017 5:00 | 11/22/2017 12:50 | 31.9 | 4.13 | 7.40 | 474,742 |
| 11/22/2017 12:50 | 11/22/2017 13:00 | 0.2 | 0.03 | 0.18 | 0.24 | 10.6 | 11/22/2017 12:50 | 11/22/2017 20:35 | 7.8 | 6.51 | 6.74 | 183,567 |
| 11/22/2017 20:40 | 11/23/2017 2:25 | 5.8 | 0.55 | 0.10 | 1.32 | 12.5 | 11/22/2017 20:35 | 11/23/2017 8:25 | 11.9 | 7.64 | 9.67 | 327,930 |
| 11/23/2017 8:25 | 11/23/2017 17:45 | 9.3 | 0.40 | 0.04 | 0.48 | 8.0 | 11/23/2017 8:25 | 11/24/2017 5:45 | 21.4 | 7.26 | 9.13 | 559,515 |
| 11/24/2017 15:50 | 11/24/2017 18:35 | 2.8 | 0.06 | 0.02 | 0.12 | 27.0 | 11/24/2017 15:45 | 11/25/2017 6:30 | 14.8 | 3.27 | 3.99 | 174,471 |
| 11/25/2017 15:45 | 11/26/2017 2:20 | 10.6 | 0.22 | 0.02 | 0.12 | 22.7 | 11/25/2017 15:40 | 11/26/2017 4:50 | 13.3 | 2.23 | 2.29 | 106,323 |
| 11/26/2017 4:50 | 11/26/2017 19:55 | 15.1 | 0.71 | 0.05 | 0.48 | 8.2 | 11/26/2017 4:50 | 11/27/2017 7:50 | 27.1 | 3.35 | 4.37 | 326,526 |
| 11/28/2017 6:00 | 11/28/2017 16:15 | 10.3 | 0.98 | 0.10 | 0.36 | 35.1 | 11/28/2017 5:55 | 11/29/2017 4:15 | 22.4 | 5.03 | 7.17 | 406,015 |
| 11/29/2017 10:00 | 11/29/2017 11:50 | 1.8 | 0.05 | 0.03 | 0.12 | 18.3 | 11/29/2017 10:00 | 11/29/2017 23:45 | 13.8 | 4.66 | 5.35 | 232,116 |
| 11/30/2017 6:25 | 11/30/2017 11:00 | 4.6 | 0.36 | 0.08 | 0.24 | 19.6 | 11/30/2017 6:20 | 11/30/2017 23:00 | 16.8 | 3.82 | 4.58 | 230,244 |
| 12/1/2017 14:55 | 12/1/2017 19:00 | 4.1 | 0.13 | 0.03 | 0.12 | 28.8 | 12/1/2017 14:55 | 12/2/2017 7:00 | 16.2 | 2.70 | 2.88 | 156,924 |
| 12/2/2017 10:15 | 12/3/2017 1:00 | 14.8 | 0.70 | 0.05 | 0.12 | 15.7 | 12/2/2017 10:15 | 12/3/2017 12:55 | 26.8 | 4.13 | 5.18 | 398,169 |
| 12/15/2017 20:50 | 12/15/2017 21:35 | 0.8 | 0.22 | 0.29 | 0.48 | 309.7 | 12/15/2017 20:45 | 12/16/2017 9:30 | 12.8 | 0.57 | 0.61 | 26,358 |
| 12/16/2017 20:45 | 12/17/2017 3:05 | 6.3 | 0.09 | 0.01 | 0.12 | 23.4 | 12/16/2017 20:45 | 12/17/2017 6:55 | 10.3 | 0.57 | 0.57 | 21,033 |
| 12/17/2017 6:55 | 12/17/2017 9:00 | 2.1 | 0.03 | 0.01 | 0.12 | 8.8 | 12/17/2017 6:55 | 12/17/2017 20:55 | 14.1 | 0.59 | 0.61 | 30,123 |
| 12/18/2017 4:45 | 12/19/2017 12:25 | 31.7 | 2.02 | 0.06 | 0.24 | 25.7 | 12/18/2017 4:40 | 12/19/2017 23:35 | 43.0 | 3.61 | 7.87 | 558,891 |
| 12/19/2017 23:35 | 12/20/2017 5:10 | 5.6 | 0.18 | 0.03 | 0.24 | 11.6 | 12/19/2017 23:35 | 12/20/2017 17:10 | 17.7 | 5.45 | 6.53 | 346,497 |
| 12/22/2017 0:50 | 12/22/2017 9:20 | 8.5 | 0.14 | 0.02 | 0.12 | 46.2 | 12/22/2017 0:45 | 12/22/2017 21:20 | 20.7 | 2.14 | 2.19 | 158,916 |
| 12/25/2017 14:10 | 12/25/2017 16:10 | 2.0 | 0.06 | 0.03 | 0.12 | 79.7 | 12/25/2017 14:10 | 12/26/2017 4:05 | 14.0 | 1.12 | 1.18 | 56,448 |
| 12/26/2017 11:20 | 12/26/2017 15:10 | 3.8 | 0.26 | 0.07 | 0.24 | 20.2 | 12/26/2017 11:15 | 12/27/2017 3:10 | 16.0 | 0.95 | 0.99 | 54,918 |
| 12/27/2017 11:10 | 12/27/2017 11:10 | 0.0 | 0.02 | 0.00 | 0.24 | 20.8 | 12/27/2017 11:10 | 12/27/2017 23:10 | 12.1 | 0.83 | 0.88 | 36,120 |
| 12/28/2017 6:40 | 12/28/2017 10:25 | 3.8 | 0.11 | 0.03 | 0.24 | 40.2 | 12/28/2017 6:40 | 12/28/2017 19:15 | 12.7 | 0.94 | 0.99 | 43,068 |
| 12/28/2017 19:15 | 12/29/2017 20:50 | 25.6 | 1.57 | 0.06 | 0.24 | 11.8 | 12/28/2017 19:15 | 12/30/2017 8:45 | 37.6 | 5.54 | 8.86 | 749,128 |

Table D-8. Summary Statistics for Individual Storm Events at the COLM Station.

| Precipitation Start Time | Precipitation Stop Time | Precipitation Duration (hour) | Precipitation Depth (inch) | Precipitation Average Intensity (inch/hour) | Precipitation Maximum Intensity (inch/hour) | Precipitation Antecedent Dry Period (hour) | Flow Start Time | Flow Stop Time | Flow Duration (hour) | Average Flow Rate (feet ³ /second) | Maximum Flow Rate (feet ³ /second) | Flow Volume (feet ³) |
|--------------------------|-------------------------|-------------------------------|----------------------------|---|---|--|------------------|------------------|----------------------|---|---|----------------------------------|
| 12/30/2017 11:40 | 12/30/2017 14:35 | 2.9 | 0.03 | 0.01 | 0.12 | 20.8 | 12/30/2017 11:35 | 12/31/2017 2:35 | 15.1 | 5.35 | 6.53 | 290,559 |
| 12/10/2017 0:13 | 12/13/2017 1:20 | 188.8 | 0.04 | 0.00 | 0.12 | 105.7 | 12/7/2017 10:35 | 12/15/2017 20:45 | 202.3 | 0.77 | 1.25 | 559,149 |
| 1/4/2018 22:25 | 1/5/2018 17:50 | 19.4 | 0.42 | 0.02 | 0.36 | 151.5 | 1/4/2018 22:25 | 1/5/2018 23:55 | 25.6 | 1.40 | 1.54 | 128,691 |
| 1/5/2018 23:55 | 1/6/2018 13:40 | 13.8 | 0.71 | 0.05 | 0.24 | 8.6 | 1/5/2018 23:55 | 1/7/2018 1:40 | 25.8 | 2.77 | 3.31 | 257,517 |
| 1/7/2018 4:45 | 1/8/2018 5:55 | 25.2 | 0.73 | 0.03 | 0.12 | 16.1 | 1/7/2018 4:40 | 1/8/2018 17:55 | 37.3 | 4.19 | 5.35 | 562,944 |
| 1/8/2018 19:55 | 1/9/2018 23:00 | 27.1 | 1.39 | 0.05 | 0.36 | 19.4 | 1/8/2018 19:50 | 1/10/2018 11:00 | 39.3 | 7.16 | 11.43 | 1,012,159 |
| 1/10/2018 13:30 | 1/11/2018 13:35 | 24.1 | 1.20 | 0.05 | 0.36 | 16.0 | 1/10/2018 13:25 | 1/11/2018 19:25 | 30.1 | 9.76 | 14.12 | 1,057,343 |
| 1/11/2018 19:30 | 1/12/2018 6:55 | 11.4 | 0.15 | 0.01 | 0.24 | 6.7 | 1/11/2018 19:25 | 1/12/2018 17:00 | 21.67 | 11.18 | 12.73 | 871,832 |
| 1/12/2018 17:05 | 1/13/2018 0:05 | 7.0 | 0.18 | 0.03 | 0.24 | 17.5 | 1/12/2018 17:00 | 1/13/2018 12:00 | 19.1 | 7.54 | 8.86 | 517,695 |
| 1/15/2018 21:25 | 1/16/2018 6:35 | 9.2 | 0.24 | 0.03 | 0.12 | 71.2 | 1/15/2018 21:20 | 1/16/2018 18:30 | 21.3 | 2.51 | 2.64 | 192,240 |
| 1/17/2018 14:45 | 1/18/2018 5:30 | 14.8 | 1.18 | 0.08 | 0.48 | 32.8 | 1/17/2018 14:45 | 1/18/2018 13:15 | 22.6 | 4.65 | 6.74 | 377,778 |
| 1/18/2018 13:15 | 1/18/2018 17:25 | 4.2 | 0.17 | 0.04 | 0.24 | 7.9 | 1/18/2018 13:15 | 1/19/2018 5:25 | 16.3 | 5.91 | 6.53 | 345,603 |
| 1/19/2018 11:50 | 1/19/2018 15:25 | 3.6 | 0.07 | 0.02 | 0.12 | 19.5 | 1/19/2018 11:45 | 1/19/2018 21:55 | 10.3 | 4.41 | 4.78 | 162,753 |
| 1/19/2018 21:55 | 1/20/2018 16:40 | 18.8 | 0.10 | 0.01 | 0.12 | 7.3 | 1/19/2018 21:55 | 1/21/2018 4:40 | 30.8 | 3.41 | 3.99 | 378,306 |
| 1/21/2018 7:00 | 1/21/2018 11:45 | 4.8 | 0.11 | 0.02 | 0.24 | 19.0 | 1/21/2018 6:55 | 1/21/2018 15:20 | 8.5 | 2.85 | 2.88 | 87,084 |
| 1/21/2018 15:25 | 1/22/2018 5:35 | 14.2 | 0.31 | 0.02 | 0.24 | 7.2 | 1/21/2018 15:20 | 1/22/2018 17:35 | 26.3 | 2.79 | 2.88 | 264,241 |
| 1/23/2018 8:55 | 1/24/2018 2:55 | 18.0 | 0.80 | 0.04 | 0.24 | 27.5 | 1/23/2018 8:55 | 1/24/2018 7:30 | 22.7 | 3.75 | 4.58 | 306,267 |
| 1/24/2018 7:35 | 1/25/2018 1:10 | 17.6 | 0.40 | 0.02 | 0.24 | 6.8 | 1/24/2018 7:30 | 1/25/2018 11:25 | 28.0 | 4.66 | 5.35 | 469,932 |
| 1/25/2018 11:30 | 1/25/2018 23:25 | 11.9 | 0.12 | 0.01 | 0.12 | 12.6 | 1/25/2018 11:25 | 1/26/2018 9:10 | 21.8 | 3.59 | 4.18 | 281,991 |
| 1/26/2018 9:15 | 1/26/2018 9:55 | 0.7 | 0.03 | 0.05 | 0.12 | 14.3 | 1/26/2018 9:10 | 1/26/2018 17:10 | 8.1 | 2.96 | 3.02 | 86,160 |
| 1/26/2018 17:10 | 1/27/2018 11:40 | 18.5 | 0.54 | 0.03 | 0.24 | 22.2 | 1/26/2018 17:10 | 1/27/2018 23:35 | 30.5 | 3.40 | 3.99 | 372,798 |
| 1/27/2018 23:45 | 1/28/2018 2:15 | 2.5 | 0.06 | 0.02 | 0.12 | 13.6 | 1/27/2018 23:45 | 1/28/2018 14:10 | 14.5 | 3.18 | 3.31 | 165,831 |
| 1/29/2018 7:55 | 1/29/2018 16:55 | 9.0 | 0.70 | 0.08 | 0.36 | 32.1 | 1/29/2018 7:50 | 1/30/2018 4:50 | 21.1 | 4.42 | 6.12 | 335,628 |
| 1/30/2018 12:50 | 1/30/2018 13:10 | 0.3 | 0.07 | 0.21 | 0.36 | 20.6 | 1/30/2018 12:45 | 1/31/2018 1:05 | 12.4 | 3.86 | 4.37 | 172,506 |
| 1/31/2018 7:50 | 1/31/2018 13:55 | 6.1 | 0.04 | 0.01 | 0.12 | 18.8 | 1/31/2018 7:50 | 2/1/2018 1:50 | 18.1 | 2.79 | 3.02 | 181,603 |
| 2/1/2018 8:30 | 2/2/2018 16:35 | 32.1 | 0.96 | 0.03 | 0.24 | 43.4 | 2/1/2018 8:30 | 2/2/2018 22:25 | 38.0 | 4.43 | 5.73 | 606,157 |
| 2/2/2018 22:25 | 2/3/2018 0:00 | 1.6 | 0.03 | 0.02 | 0.12 | 7.1 | 2/2/2018 22:25 | 2/3/2018 11:55 | 13.6 | 4.37 | 4.78 | 213,873 |
| 2/3/2018 14:10 | 2/4/2018 12:10 | 22.0 | 1.00 | 0.05 | 0.24 | 22.8 | 2/3/2018 14:10 | 2/5/2018 0:10 | 34.1 | 6.92 | 8.61 | 848,597 |
| 2/5/2018 4:10 | 2/5/2018 6:55 | 2.8 | 0.04 | 0.01 | 0.12 | 19.1 | 2/5/2018 4:05 | 2/5/2018 17:10 | 13.2 | 5.59 | 6.12 | 264,987 |
| 2/5/2018 17:10 | 2/6/2018 6:20 | 13.2 | 0.60 | 0.05 | 0.24 | 13.0 | 2/5/2018 17:10 | 2/6/2018 15:20 | 22.3 | 6.40 | 7.17 | 512,330 |
| 2/6/2018 15:20 | 2/7/2018 1:20 | 10.0 | 0.09 | 0.01 | 0.12 | 12.2 | 2/6/2018 15:20 | 2/7/2018 13:15 | 22.0 | 5.48 | 6.32 | 434,040 |
| 2/8/2018 13:40 | 2/8/2018 20:35 | 6.9 | 0.18 | 0.03 | 0.24 | 40.7 | 2/8/2018 13:40 | 2/9/2018 7:05 | 17.5 | 3.28 | 3.47 | 206,925 |
| 2/9/2018 7:10 | 2/9/2018 9:00 | 1.8 | 0.03 | 0.02 | 0.12 | 13.5 | 2/9/2018 7:05 | 2/9/2018 20:55 | 13.9 | 2.90 | 3.15 | 145,041 |
| 2/13/2018 21:05 | 2/14/2018 13:10 | 16.1 | 0.48 | 0.03 | 0.24 | 123.4 | 2/13/2018 21:00 | 2/15/2018 1:05 | 28.2 | 1.49 | 1.63 | 151,137 |
| 2/16/2018 1:55 | 2/17/2018 11:20 | 33.4 | 0.92 | 0.03 | 0.24 | 39.4 | 2/16/2018 1:50 | 2/17/2018 23:20 | 45.6 | 2.22 | 3.02 | 364,972 |
| 2/22/2018 10:50 | 2/22/2018 10:55 | 0.1 | 0.04 | 0.48 | 0.36 | 122.0 | 2/22/2018 10:50 | 2/22/2018 22:50 | 12.1 | 0.78 | 0.78 | 33,900 |
| 2/24/2018 4:40 | 2/24/2018 8:10 | 3.5 | 0.10 | 0.03 | 0.12 | 41.8 | 2/24/2018 4:40 | 2/24/2018 20:10 | 15.6 | 0.71 | 0.73 | 39,585 |
| 2/24/2018 23:30 | 2/25/2018 3:00 | 3.5 | 0.04 | 0.01 | 0.12 | 18.1 | 2/24/2018 23:25 | 2/25/2018 10:50 | 11.5 | 0.73 | 0.73 | 30,222 |
| 2/25/2018 10:55 | 2/25/2018 13:00 | 2.1 | 0.20 | 0.10 | 0.24 | 11.4 | 2/25/2018 10:50 | 2/26/2018 0:55 | 14.2 | 1.03 | 1.32 | 52,491 |
| 2/26/2018 10:15 | 2/26/2018 13:25 | 3.2 | 0.57 | 0.18 | 0.48 | 21.9 | 2/26/2018 10:15 | 2/27/2018 1:25 | 15.3 | 1.16 | 1.18 | 63,531 |
| 2/27/2018 15:00 | 2/28/2018 2:00 | 11.0 | 0.16 | 0.01 | 0.24 | 25.7 | 2/27/2018 14:55 | 2/28/2018 13:40 | 22.8 | 1.36 | 1.46 | 111,927 |
| 2/28/2018 13:45 | 3/1/2018 3:40 | 13.9 | 0.45 | 0.03 | 0.12 | 15.7 | 2/28/2018 13:40 | 3/1/2018 15:40 | 26.1 | 2.50 | 3.02 | 235,041 |
| 3/2/2018 1:55 | 3/2/2018 6:10 | 4.3 | 0.29 | 0.07 | 0.24 | 24.2 | 3/2/2018 1:50 | 3/2/2018 18:10 | 16.4 | 2.65 | 2.88 | 156,597 |
| 3/4/2018 14:45 | 3/4/2018 16:30 | 1.8 | 0.13 | 0.07 | 0.36 | 57.2 | 3/4/2018 14:45 | 3/5/2018 0:40 | 10.0 | 1.43 | 1.54 | 51,498 |

Table D-8. Summary Statistics for Individual Storm Events at the COLM Station.

| Precipitation Start Time | Precipitation Stop Time | Precipitation Duration (hour) | Precipitation Depth (inch) | Precipitation Average Intensity (inch/hour) | Precipitation Maximum Intensity (inch/hour) | Precipitation Antecedent Dry Period (hour) | Flow Start Time | Flow Stop Time | Flow Duration (hour) | Average Flow Rate (feet ³ /second) | Maximum Flow Rate (feet ³ /second) | Flow Volume (feet ³) |
|--------------------------|-------------------------|-------------------------------|----------------------------|---|---|--|-----------------|-----------------|----------------------|---|---|----------------------------------|
| 3/5/2018 0:40 | 3/5/2018 9:05 | 8.4 | 0.14 | 0.02 | 0.24 | 8.3 | 3/5/2018 0:40 | 3/5/2018 21:00 | 20.4 | 1.43 | 1.46 | 104,748 |
| 3/7/2018 22:40 | 3/7/2018 23:35 | 0.9 | 0.05 | 0.05 | 0.12 | 61.9 | 3/7/2018 22:40 | 3/8/2018 7:40 | 9.1 | 0.94 | 0.94 | 30,738 |
| 3/8/2018 7:45 | 3/8/2018 18:30 | 10.8 | 0.67 | 0.06 | 0.24 | 8.7 | 3/8/2018 7:40 | 3/9/2018 4:15 | 20.7 | 1.56 | 2.09 | 115,863 |
| 3/9/2018 4:20 | 3/9/2018 5:50 | 1.5 | 0.10 | 0.07 | 0.12 | 10.2 | 3/9/2018 4:15 | 3/9/2018 17:45 | 13.6 | 1.89 | 1.99 | 92,265 |
| 3/13/2018 14:00 | 3/13/2018 18:50 | 4.8 | 0.31 | 0.06 | 0.12 | 105.2 | 3/13/2018 14:00 | 3/14/2018 5:25 | 15.5 | 0.91 | 0.94 | 50,649 |
| 3/14/2018 5:25 | 3/14/2018 7:55 | 2.5 | 0.09 | 0.04 | 0.24 | 11.1 | 3/14/2018 5:25 | 3/14/2018 19:50 | 14.5 | 0.95 | 1.05 | 49,416 |
| 3/18/2018 10:05 | 3/21/2018 22:25 | 0.0 | 0.01 | 0.04 | 0.12 | 182.8 | 3/15/2018 23:45 | 3/21/2018 22:50 | 143.2 | 0.57 | 0.78 | 291,443 |
| 3/23/2018 5:40 | 3/23/2018 10:50 | 5.2 | 0.23 | 0.04 | 0.12 | 17.0 | 3/23/2018 5:40 | 3/23/2018 22:50 | 17.3 | 0.67 | 0.73 | 41,649 |
| 3/23/2018 23:45 | 3/24/2018 9:35 | 9.8 | 0.33 | 0.03 | 0.12 | 13.7 | 3/23/2018 23:45 | 3/24/2018 21:30 | 21.8 | 0.86 | 0.99 | 67,821 |

Table D-9. Summary Statistics for Individual Storm Events at the SEIMN Station.

| Precipitation Start Time | Precipitation Stop Time | Precipitation Duration (hour) | Precipitation Depth (inch) | Precipitation Average Intensity (inch/hour) | Precipitation Maximum Intensity (inch/hour) | Precipitation Antecedent Dry Period (hour) | Flow Start Time | Flow Stop Time | Flow Duration (hour) | Average Flow Rate (feet ³ /second) | Maximum Flow Rate (feet ³ /second) | Flow Volume (feet ³) |
|--------------------------|-------------------------|-------------------------------|----------------------------|---|---|--|------------------|------------------|----------------------|---|---|----------------------------------|
| 10/7/2017 13:55 | 10/8/2017 5:05 | 15.2 | 0.80 | 0.05 | 0.96 | 13.0 | 10/7/2017 13:55 | 10/8/2017 17:00 | 27.2 | 0.17 | 0.80 | 16,677 |
| 10/10/2017 14:00 | 10/10/2017 20:40 | 6.7 | 0.25 | 0.04 | 0.48 | 57.2 | 10/10/2017 14:00 | 10/11/2017 8:35 | 18.7 | 0.11 | 0.16 | 7,485 |
| 10/12/2017 7:20 | 10/12/2017 18:15 | 10.9 | 0.10 | 0.01 | 0.12 | 36.8 | 10/12/2017 7:15 | 10/12/2017 22:50 | 15.7 | 0.10 | 0.10 | 5,634 |
| 10/12/2017 22:50 | 10/13/2017 11:40 | 12.8 | 0.76 | 0.06 | 0.48 | 9.8 | 10/12/2017 22:50 | 10/13/2017 23:35 | 24.8 | 0.21 | 0.73 | 18,684 |
| 10/17/2017 7:00 | 10/17/2017 17:05 | 10.1 | 0.27 | 0.03 | 0.36 | 95.9 | 10/17/2017 7:00 | 10/18/2017 5:00 | 22.1 | 0.10 | 0.16 | 7,689 |
| 10/18/2017 9:15 | 10/20/2017 11:35 | 50.3 | 1.89 | 0.04 | 0.48 | 22.7 | 10/18/2017 9:10 | 10/20/2017 23:35 | 62.5 | 0.49 | 0.97 | 110,805 |
| 10/21/2017 2:35 | 10/21/2017 23:45 | 21.2 | 0.86 | 0.04 | 0.24 | 19.8 | 10/21/2017 2:35 | 10/22/2017 11:45 | 33.3 | 0.45 | 0.79 | 54,429 |
| 10/25/2017 14:35 | 10/25/2017 17:30 | 2.9 | 0.04 | 0.01 | 0.12 | 88.8 | 10/25/2017 14:35 | 10/26/2017 5:30 | 15.0 | 0.10 | 0.10 | 5,388 |
| 11/1/2017 6:35 | 11/1/2017 16:50 | 10.3 | 0.14 | 0.01 | 0.24 | 160.0 | 11/1/2017 6:30 | 11/2/2017 4:50 | 22.4 | 0.10 | 0.13 | 8,277 |
| 11/2/2017 9:05 | 11/2/2017 12:00 | 2.9 | 0.17 | 0.06 | 0.60 | 24.8 | 11/2/2017 9:00 | 11/2/2017 20:00 | 11.1 | 0.13 | 0.20 | 5,268 |
| 11/2/2017 20:00 | 11/3/2017 3:10 | 7.2 | 0.17 | 0.02 | 0.24 | 8.2 | 11/2/2017 20:00 | 11/3/2017 3:40 | 7.8 | 0.15 | 0.20 | 4,209 |
| 11/3/2017 3:40 | 11/3/2017 14:55 | 11.3 | 0.29 | 0.03 | 0.12 | 6.4 | 11/3/2017 3:40 | 11/4/2017 2:55 | 23.3 | 0.20 | 0.24 | 16,530 |
| 11/4/2017 13:00 | 11/5/2017 18:25 | 29.4 | 1.22 | 0.04 | 0.24 | 22.4 | 11/4/2017 12:55 | 11/6/2017 6:20 | 41.5 | 0.59 | 0.91 | 88,038 |
| 11/8/2017 16:55 | 11/8/2017 20:15 | 3.3 | 0.08 | 0.02 | 0.12 | 72.7 | 11/8/2017 16:50 | 11/9/2017 6:40 | 13.9 | 0.25 | 0.29 | 12,564 |
| 11/9/2017 6:40 | 11/10/2017 1:40 | 19.0 | 0.42 | 0.02 | 0.36 | 12.9 | 11/9/2017 6:40 | 11/10/2017 13:40 | 31.1 | 0.36 | 0.53 | 39,996 |
| 11/11/2017 9:10 | 11/11/2017 16:25 | 7.3 | 0.09 | 0.01 | 0.12 | 37.1 | 11/11/2017 9:10 | 11/11/2017 23:55 | 14.8 | 0.24 | 0.29 | 13,011 |
| 11/11/2017 23:55 | 11/12/2017 8:00 | 8.1 | 0.38 | 0.05 | 0.24 | 8.8 | 11/11/2017 23:55 | 11/12/2017 14:45 | 14.9 | 0.37 | 0.53 | 19,728 |
| 11/12/2017 14:45 | 11/13/2017 7:45 | 17.0 | 0.40 | 0.02 | 0.36 | 7.3 | 11/12/2017 14:45 | 11/13/2017 15:30 | 24.8 | 0.55 | 0.68 | 48,888 |
| 11/13/2017 15:35 | 11/13/2017 18:05 | 2.5 | 0.22 | 0.09 | 0.24 | 8.9 | 11/13/2017 15:30 | 11/14/2017 6:00 | 14.6 | 0.59 | 0.73 | 31,107 |
| 11/14/2017 22:15 | 11/15/2017 11:10 | 12.9 | 0.53 | 0.04 | 0.24 | 29.1 | 11/14/2017 22:15 | 11/15/2017 23:10 | 25.0 | 0.55 | 0.68 | 49,578 |
| 11/16/2017 2:05 | 11/16/2017 14:05 | 12.0 | 0.20 | 0.02 | 0.12 | 17.8 | 11/16/2017 2:00 | 11/17/2017 2:00 | 24.1 | 0.49 | 0.58 | 42,660 |
| 11/19/2017 15:55 | 11/20/2017 17:05 | 25.2 | 0.98 | 0.04 | 1.08 | 76.1 | 11/19/2017 15:55 | 11/21/2017 5:00 | 37.2 | 0.63 | 1.10 | 84,852 |
| 11/21/2017 5:05 | 11/22/2017 8:10 | 27.1 | 1.68 | 0.06 | 0.36 | 12.8 | 11/21/2017 5:00 | 11/22/2017 12:45 | 31.8 | 1.73 | 2.80 | 198,402 |
| 11/22/2017 12:50 | 11/22/2017 13:00 | 0.2 | 0.03 | 0.18 | 0.24 | 10.6 | 11/22/2017 12:45 | 11/22/2017 20:35 | 7.9 | 1.37 | 1.71 | 39,018 |
| 11/22/2017 20:40 | 11/23/2017 2:25 | 5.8 | 0.55 | 0.10 | 1.32 | 12.5 | 11/22/2017 20:35 | 11/23/2017 8:25 | 11.9 | 1.72 | 2.07 | 73,878 |
| 11/23/2017 8:25 | 11/23/2017 17:45 | 9.3 | 0.40 | 0.04 | 0.48 | 8.0 | 11/23/2017 8:25 | 11/24/2017 5:45 | 21.4 | 1.82 | 2.17 | 140,115 |
| 11/24/2017 15:50 | 11/24/2017 18:35 | 2.8 | 0.06 | 0.02 | 0.12 | 27.0 | 11/24/2017 15:45 | 11/25/2017 6:30 | 14.8 | 0.93 | 1.03 | 49,512 |
| 11/25/2017 15:45 | 11/26/2017 2:20 | 10.6 | 0.22 | 0.02 | 0.12 | 22.7 | 11/25/2017 15:40 | 11/26/2017 4:50 | 13.3 | 0.75 | 0.79 | 35,847 |
| 11/26/2017 4:50 | 11/26/2017 19:55 | 15.1 | 0.71 | 0.05 | 0.48 | 8.2 | 11/26/2017 4:50 | 11/27/2017 7:50 | 27.1 | 1.02 | 1.39 | 99,189 |
| 11/28/2017 6:00 | 11/28/2017 16:15 | 10.3 | 0.98 | 0.10 | 0.36 | 35.1 | 11/28/2017 5:55 | 11/29/2017 4:15 | 22.4 | 1.41 | 1.89 | 113,865 |
| 11/29/2017 10:00 | 11/29/2017 11:50 | 1.8 | 0.05 | 0.03 | 0.12 | 18.3 | 11/29/2017 9:55 | 11/29/2017 23:45 | 13.9 | 1.12 | 1.31 | 56,082 |
| 11/30/2017 6:25 | 11/30/2017 11:00 | 4.6 | 0.36 | 0.08 | 0.24 | 19.6 | 11/30/2017 6:20 | 11/30/2017 23:00 | 16.8 | 1.11 | 1.24 | 67,035 |
| 12/1/2017 14:55 | 12/1/2017 19:00 | 4.1 | 0.13 | 0.03 | 0.12 | 28.8 | 12/1/2017 14:55 | 12/2/2017 6:55 | 16.1 | 0.89 | 0.97 | 51,447 |
| 12/2/2017 10:15 | 12/3/2017 1:00 | 14.8 | 0.70 | 0.05 | 0.12 | 15.7 | 12/2/2017 10:15 | 12/3/2017 12:55 | 26.8 | 1.30 | 1.54 | 125,598 |
| 12/15/2017 20:50 | 12/15/2017 21:35 | 0.8 | 0.22 | 0.29 | 0.48 | 309.7 | 12/15/2017 20:45 | 12/16/2017 9:30 | 12.8 | 0.32 | 0.42 | 14,679 |
| 12/16/2017 20:45 | 12/17/2017 3:05 | 6.3 | 0.09 | 0.01 | 0.12 | 23.4 | 12/16/2017 20:45 | 12/17/2017 6:55 | 10.3 | 0.30 | 0.35 | 11,145 |
| 12/17/2017 6:55 | 12/17/2017 9:00 | 2.1 | 0.03 | 0.01 | 0.12 | 8.8 | 12/17/2017 6:55 | 12/17/2017 20:55 | 14.1 | 0.26 | 0.29 | 12,948 |
| 12/18/2017 4:45 | 12/19/2017 12:25 | 31.7 | 2.02 | 0.06 | 0.24 | 25.7 | 12/18/2017 4:40 | 12/19/2017 23:35 | 43.0 | 1.27 | 2.80 | 197,013 |
| 12/19/2017 23:35 | 12/20/2017 5:10 | 5.6 | 0.18 | 0.03 | 0.24 | 11.6 | 12/19/2017 23:35 | 12/20/2017 17:10 | 17.7 | 1.39 | 1.63 | 88,290 |
| 12/22/2017 0:50 | 12/22/2017 9:20 | 8.5 | 0.14 | 0.02 | 0.12 | 46.2 | 12/22/2017 0:45 | 12/22/2017 21:20 | 20.7 | 0.67 | 0.73 | 49,632 |
| 12/25/2017 14:10 | 12/25/2017 16:10 | 2.0 | 0.06 | 0.03 | 0.12 | 79.7 | 12/25/2017 14:10 | 12/26/2017 4:05 | 14.0 | 0.48 | 0.49 | 24,045 |
| 12/26/2017 11:20 | 12/26/2017 15:10 | 3.8 | 0.26 | 0.07 | 0.24 | 20.2 | 12/26/2017 11:15 | 12/27/2017 3:10 | 16.0 | 0.42 | 0.42 | 24,192 |
| 12/27/2017 11:10 | 12/27/2017 11:10 | 0.0 | 0.02 | 0.00 | 0.24 | 20.8 | 12/27/2017 11:10 | 12/27/2017 23:10 | 12.1 | 0.42 | 0.42 | 18,270 |

Table D-9. Summary Statistics for Individual Storm Events at the SEIMN Station.

| Precipitation Start Time | Precipitation Stop Time | Precipitation Duration (hour) | Precipitation Depth (inch) | Precipitation Average Intensity (inch/hour) | Precipitation Maximum Intensity (inch/hour) | Precipitation Antecedent Dry Period (hour) | Flow Start Time | Flow Stop Time | Flow Duration (hour) | Average Flow Rate (feet ³ /second) | Maximum Flow Rate (feet ³ /second) | Flow Volume (feet ³) |
|--------------------------|-------------------------|-------------------------------|----------------------------|---|---|--|------------------|------------------|----------------------|---|---|----------------------------------|
| 12/28/2017 6:40 | 12/28/2017 10:25 | 3.8 | 0.11 | 0.03 | 0.24 | 40.2 | 12/28/2017 6:40 | 12/28/2017 19:15 | 12.7 | 0.51 | 0.53 | 23,115 |
| 12/28/2017 19:15 | 12/29/2017 20:50 | 25.6 | 1.57 | 0.06 | 0.24 | 11.8 | 12/28/2017 19:15 | 12/30/2017 8:45 | 37.6 | 1.83 | 3.39 | 247,671 |
| 12/30/2017 11:40 | 12/30/2017 14:35 | 2.9 | 0.03 | 0.01 | 0.12 | 20.8 | 12/30/2017 11:35 | 12/31/2017 2:35 | 15.1 | 1.16 | 1.39 | 63,255 |
| 1/4/2018 22:25 | 1/5/2018 17:50 | 19.4 | 0.42 | 0.02 | 0.36 | 151.5 | 1/4/2018 22:25 | 1/5/2018 23:55 | 25.6 | 0.52 | 0.58 | 48,126 |
| 1/5/2018 23:55 | 1/6/2018 13:40 | 13.8 | 0.71 | 0.05 | 0.24 | 8.6 | 1/5/2018 23:55 | 1/7/2018 1:40 | 25.8 | 0.97 | 1.17 | 90,558 |
| 1/7/2018 4:45 | 1/8/2018 5:55 | 25.2 | 0.73 | 0.03 | 0.12 | 16.1 | 1/7/2018 4:45 | 1/8/2018 17:55 | 37.3 | 1.32 | 1.71 | 176,835 |
| 1/8/2018 19:55 | 1/9/2018 23:00 | 27.1 | 1.39 | 0.05 | 0.36 | 19.4 | 1/8/2018 19:50 | 1/10/2018 11:00 | 39.3 | 2.06 | 3.15 | 290,754 |
| 1/10/2018 13:30 | 1/11/2018 13:35 | 24.1 | 1.20 | 0.05 | 0.36 | 16.0 | 1/10/2018 13:30 | 1/11/2018 19:25 | 30.0 | 2.42 | 4.48 | 261,351 |
| 1/11/2018 19:30 | 1/12/2018 6:55 | 11.4 | 0.15 | 0.01 | 0.24 | 6.7 | 1/11/2018 19:25 | 1/12/2018 17:00 | 21.7 | 2.58 | 3.78 | 201,480 |
| 1/12/2018 17:05 | 1/13/2018 0:05 | 7.0 | 0.18 | 0.03 | 0.24 | 17.5 | 1/12/2018 17:00 | 1/13/2018 12:00 | 19.1 | 1.64 | 1.89 | 112,368 |
| 1/15/2018 21:25 | 1/16/2018 6:35 | 9.2 | 0.24 | 0.03 | 0.12 | 71.2 | 1/15/2018 21:25 | 1/16/2018 18:35 | 21.3 | 0.89 | 0.97 | 68,265 |
| 1/17/2018 14:45 | 1/18/2018 5:30 | 14.8 | 1.18 | 0.08 | 0.48 | 32.8 | 1/17/2018 14:45 | 1/18/2018 13:15 | 22.6 | 1.43 | 1.89 | 116,661 |
| 1/18/2018 13:15 | 1/18/2018 17:25 | 4.2 | 0.17 | 0.04 | 0.24 | 7.9 | 1/18/2018 13:15 | 1/19/2018 5:25 | 16.3 | 1.55 | 1.80 | 90,702 |
| 1/19/2018 11:50 | 1/19/2018 15:25 | 3.6 | 0.07 | 0.02 | 0.12 | 19.5 | 1/19/2018 11:45 | 1/19/2018 21:55 | 10.3 | 1.12 | 1.17 | 41,325 |
| 1/19/2018 21:55 | 1/20/2018 16:40 | 18.8 | 0.10 | 0.01 | 0.12 | 7.3 | 1/19/2018 21:55 | 1/21/2018 4:40 | 30.8 | 0.98 | 1.10 | 108,660 |
| 1/21/2018 7:00 | 1/21/2018 11:45 | 4.8 | 0.11 | 0.02 | 0.24 | 19.0 | 1/21/2018 6:55 | 1/21/2018 15:20 | 8.5 | 0.90 | 0.91 | 27,576 |
| 1/21/2018 15:25 | 1/22/2018 5:35 | 14.2 | 0.31 | 0.02 | 0.24 | 7.2 | 1/21/2018 15:20 | 1/22/2018 17:35 | 26.3 | 0.90 | 0.97 | 85,332 |
| 1/23/2018 8:55 | 1/24/2018 2:55 | 18.0 | 0.80 | 0.04 | 0.24 | 27.5 | 1/23/2018 8:55 | 1/24/2018 7:35 | 22.8 | 1.14 | 1.31 | 93,534 |
| 1/24/2018 7:35 | 1/25/2018 1:10 | 17.6 | 0.40 | 0.02 | 0.24 | 6.8 | 1/24/2018 7:35 | 1/25/2018 11:25 | 27.9 | 1.25 | 1.39 | 125,217 |
| 1/25/2018 11:30 | 1/25/2018 23:25 | 11.9 | 0.12 | 0.01 | 0.12 | 12.6 | 1/25/2018 11:25 | 1/26/2018 9:10 | 21.8 | 1.06 | 1.17 | 83,547 |
| 1/26/2018 9:15 | 1/26/2018 9:55 | 0.7 | 0.03 | 0.05 | 0.12 | 14.3 | 1/26/2018 9:10 | 1/26/2018 17:10 | 8.1 | 0.92 | 0.97 | 26,787 |
| 1/26/2018 17:10 | 1/27/2018 11:40 | 18.5 | 0.54 | 0.03 | 0.24 | 22.2 | 1/26/2018 17:10 | 1/27/2018 23:35 | 30.5 | 1.07 | 1.31 | 117,867 |
| 1/27/2018 23:45 | 1/28/2018 2:15 | 2.5 | 0.06 | 0.02 | 0.12 | 13.6 | 1/27/2018 23:45 | 1/28/2018 14:10 | 14.5 | 1.01 | 1.10 | 52,707 |
| 1/29/2018 7:55 | 1/29/2018 16:55 | 9.0 | 0.70 | 0.08 | 0.36 | 32.1 | 1/29/2018 7:55 | 1/30/2018 4:50 | 21.0 | 1.55 | 1.98 | 116,862 |
| 1/30/2018 12:50 | 1/30/2018 13:10 | 0.3 | 0.07 | 0.21 | 0.36 | 20.6 | 1/30/2018 12:45 | 1/31/2018 1:05 | 12.4 | 1.18 | 1.39 | 52,893 |
| 1/31/2018 7:50 | 1/31/2018 13:55 | 6.1 | 0.04 | 0.01 | 0.12 | 18.8 | 1/31/2018 7:50 | 2/1/2018 1:50 | 18.1 | 0.91 | 0.97 | 59,205 |
| 2/1/2018 8:30 | 2/2/2018 16:35 | 32.1 | 0.96 | 0.03 | 0.24 | 43.4 | 2/1/2018 8:25 | 2/2/2018 22:25 | 38.1 | 1.38 | 1.71 | 189,537 |
| 2/2/2018 22:25 | 2/3/2018 0:00 | 1.6 | 0.03 | 0.02 | 0.12 | 7.1 | 2/2/2018 22:25 | 2/3/2018 12:00 | 13.7 | 1.25 | 1.39 | 61,737 |
| 2/3/2018 14:10 | 2/4/2018 12:10 | 22.0 | 1.00 | 0.05 | 0.24 | 22.8 | 2/3/2018 14:10 | 2/5/2018 0:10 | 34.1 | 2.12 | 2.80 | 260,256 |
| 2/5/2018 4:10 | 2/5/2018 6:55 | 2.8 | 0.04 | 0.01 | 0.12 | 19.1 | 2/5/2018 4:05 | 2/5/2018 17:10 | 13.2 | 1.48 | 1.71 | 70,095 |
| 2/5/2018 17:10 | 2/6/2018 6:20 | 13.2 | 0.60 | 0.05 | 0.24 | 13.0 | 2/5/2018 17:10 | 2/6/2018 15:20 | 22.3 | 1.62 | 1.89 | 129,459 |
| 2/6/2018 15:20 | 2/7/2018 1:20 | 10.0 | 0.09 | 0.01 | 0.12 | 12.2 | 2/6/2018 15:20 | 2/7/2018 13:15 | 22.0 | 1.29 | 1.54 | 102,555 |
| 2/8/2018 13:40 | 2/8/2018 20:35 | 6.9 | 0.18 | 0.03 | 0.24 | 40.7 | 2/8/2018 13:40 | 2/9/2018 7:05 | 17.5 | 0.94 | 0.97 | 59,112 |
| 2/9/2018 7:10 | 2/9/2018 9:00 | 1.8 | 0.03 | 0.02 | 0.12 | 13.5 | 2/9/2018 7:05 | 2/9/2018 20:55 | 13.9 | 0.89 | 0.91 | 44,421 |
| 2/13/2018 21:05 | 2/14/2018 13:10 | 16.1 | 0.48 | 0.03 | 0.24 | 123.4 | 2/13/2018 21:00 | 2/15/2018 1:05 | 28.2 | 0.77 | 0.85 | 77,574 |
| 2/16/2018 1:55 | 2/17/2018 11:20 | 33.4 | 0.92 | 0.03 | 0.24 | 39.4 | 2/16/2018 1:55 | 2/17/2018 23:15 | 45.4 | 0.94 | 1.17 | 153,429 |
| 2/22/2018 10:50 | 2/22/2018 10:55 | 0.1 | 0.04 | 0.48 | 0.36 | 122.0 | 2/22/2018 10:50 | 2/22/2018 22:50 | 12.1 | 0.58 | 0.58 | 25,230 |
| 2/24/2018 4:40 | 2/24/2018 8:10 | 3.5 | 0.10 | 0.03 | 0.12 | 41.8 | 2/24/2018 4:40 | 2/24/2018 20:10 | 15.6 | 0.59 | 0.63 | 33,348 |
| 2/24/2018 23:30 | 2/25/2018 3:00 | 3.5 | 0.04 | 0.01 | 0.12 | 18.1 | 2/24/2018 23:25 | 2/25/2018 10:50 | 11.5 | 0.59 | 0.63 | 24,477 |
| 2/25/2018 10:55 | 2/25/2018 13:00 | 2.1 | 0.20 | 0.10 | 0.24 | 11.4 | 2/25/2018 10:50 | 2/26/2018 0:55 | 14.2 | 0.65 | 0.79 | 33,186 |
| 2/26/2018 10:15 | 2/26/2018 13:25 | 3.2 | 0.57 | 0.18 | 0.48 | 21.9 | 2/26/2018 10:15 | 2/27/2018 1:25 | 15.3 | 0.67 | 0.68 | 36,912 |
| 2/27/2018 15:00 | 2/28/2018 2:00 | 11.0 | 0.16 | 0.01 | 0.24 | 25.7 | 2/27/2018 14:55 | 2/28/2018 13:40 | 22.8 | 0.71 | 0.79 | 58,743 |
| 2/28/2018 13:45 | 3/1/2018 3:40 | 13.9 | 0.45 | 0.03 | 0.12 | 15.7 | 2/28/2018 13:40 | 3/1/2018 15:40 | 26.1 | 1.08 | 1.31 | 101,757 |

Table D-9. Summary Statistics for Individual Storm Events at the SEIMN Station.

| Precipitation Start Time | Precipitation Stop Time | Precipitation Duration (hour) | Precipitation Depth (inch) | Precipitation Average Intensity (inch/hour) | Precipitation Maximum Intensity (inch/hour) | Precipitation Antecedent Dry Period (hour) | Flow Start Time | Flow Stop Time | Flow Duration (hour) | Average Flow Rate (feet ³ /second) | Maximum Flow Rate (feet ³ /second) | Flow Volume (feet ³) |
|--------------------------|-------------------------|-------------------------------|----------------------------|---|---|--|-----------------|-----------------|----------------------|---|---|----------------------------------|
| 3/2/2018 1:55 | 3/2/2018 6:10 | 4.3 | 0.29 | 0.07 | 0.24 | 24.2 | 3/2/2018 1:55 | 3/2/2018 18:10 | 16.3 | 1.02 | 1.10 | 59,892 |
| 3/4/2018 14:45 | 3/4/2018 16:30 | 1.8 | 0.13 | 0.07 | 0.36 | 57.2 | 3/4/2018 14:45 | 3/5/2018 0:40 | 10.0 | 0.75 | 0.79 | 27,108 |
| 3/5/2018 0:40 | 3/5/2018 9:05 | 8.4 | 0.14 | 0.02 | 0.24 | 8.3 | 3/5/2018 0:40 | 3/5/2018 21:05 | 20.5 | 0.73 | 0.79 | 53,760 |
| 3/7/2018 22:40 | 3/7/2018 23:35 | 0.9 | 0.05 | 0.05 | 0.12 | 61.9 | 3/7/2018 22:40 | 3/8/2018 7:40 | 9.1 | 0.67 | 0.68 | 21,846 |
| 3/8/2018 7:45 | 3/8/2018 18:30 | 10.8 | 0.67 | 0.06 | 0.24 | 8.7 | 3/8/2018 7:40 | 3/9/2018 4:15 | 20.7 | 0.92 | 1.10 | 68,694 |
| 3/9/2018 4:20 | 3/9/2018 5:50 | 1.5 | 0.10 | 0.07 | 0.12 | 10.2 | 3/9/2018 4:15 | 3/9/2018 17:45 | 13.6 | 0.87 | 0.97 | 42,375 |
| 3/13/2018 14:00 | 3/13/2018 18:50 | 4.8 | 0.31 | 0.06 | 0.12 | 105.2 | 3/13/2018 14:00 | 3/14/2018 5:25 | 15.5 | 0.64 | 0.68 | 35,574 |
| 3/14/2018 5:25 | 3/14/2018 7:55 | 2.5 | 0.09 | 0.04 | 0.24 | 11.1 | 3/14/2018 5:25 | 3/14/2018 19:50 | 14.5 | 0.63 | 0.68 | 32,901 |
| 3/21/2018 22:40 | 3/23/2018 0:50 | 26.2 | 0.54 | 0.02 | 0.24 | 184.1 | 3/21/2018 22:40 | 3/23/2018 5:35 | 31.0 | 0.52 | 0.63 | 57,924 |

Table D-10. Summary Statistics for Individual Storm Events at the SEIMS Station.

| Precipitation Start Time | Precipitation Stop Time | Precipitation Duration (hour) | Precipitation Depth (inch) | Precipitation Average Intensity (inch/hour) | Precipitation Maximum Intensity (inch/hour) | Precipitation Antecedent Dry Period (hour) | Flow Start Time | Flow Stop Time | Flow Duration (hour) | Average Flow Rate (feet ³ /second) | Maximum Flow Rate (feet ³ /second) | Flow Volume (feet ³) |
|--------------------------|-------------------------|-------------------------------|----------------------------|---|---|--|------------------|------------------|----------------------|---|---|----------------------------------|
| 10/7/2017 13:55 | 10/8/2017 5:05 | 15.1667 | 0.8 | 0.0527 | 0.96 | 13 | 10/7/2017 13:55 | 10/8/2017 17:00 | 27.1667 | 0.487 | 1.33 | 47772.02 |
| 10/10/2017 14:00 | 10/10/2017 20:40 | 6.6667 | 0.25 | 0.0375 | 0.48 | 57.2 | 10/10/2017 14:00 | 10/11/2017 8:35 | 18.6667 | 0.3386 | 0.41 | 22752.04 |
| 10/12/2017 7:20 | 10/12/2017 18:15 | 10.9167 | 0.1 | 0.0092 | 0.12 | 36.8 | 10/12/2017 7:15 | 10/12/2017 22:50 | 15.6667 | 0.29 | 0.29 | 16356.04 |
| 10/12/2017 22:50 | 10/13/2017 11:40 | 12.8333 | 0.76 | 0.0592 | 0.48 | 9.8 | 10/12/2017 22:50 | 10/13/2017 23:40 | 24.8333 | 0.6419 | 2.42 | 57575.96 |
| 10/17/2017 7:00 | 10/17/2017 17:05 | 10.0833 | 0.27 | 0.0268 | 0.36 | 95.9 | 10/17/2017 7:00 | 10/18/2017 5:00 | 22.0833 | 0.3223 | 0.45 | 25722.06 |
| 10/18/2017 9:15 | 10/20/2017 11:35 | 50.3333 | 1.89 | 0.0375 | 0.48 | 22.7 | 10/18/2017 9:10 | 10/20/2017 23:35 | 62.5 | 0.6627 | 1.51 | 149111.5 |
| 10/21/2017 2:35 | 10/21/2017 23:45 | 21.1667 | 0.86 | 0.0406 | 0.24 | 19.8 | 10/21/2017 2:35 | 10/22/2017 11:45 | 33.25 | 0.6209 | 1.33 | 74325.04 |
| 10/25/2017 14:35 | 10/25/2017 17:30 | 2.9167 | 0.04 | 0.0137 | 0.12 | 88.8 | 10/25/2017 14:35 | 10/26/2017 5:25 | 15 | 0.33 | 0.33 | 17721.04 |
| 11/1/2017 6:35 | 11/1/2017 16:50 | 10.25 | 0.14 | 0.0137 | 0.24 | 160 | 11/1/2017 6:30 | 11/2/2017 4:50 | 22.4167 | 0.3611 | 0.45 | 29139.04 |
| 11/2/2017 9:05 | 11/2/2017 12:00 | 2.9167 | 0.17 | 0.0583 | 0.6 | 24.8 | 11/2/2017 9:00 | 11/2/2017 20:00 | 11.0833 | 0.4034 | 0.55 | 16094.99 |
| 11/2/2017 20:00 | 11/3/2017 3:10 | 7.1667 | 0.17 | 0.0237 | 0.24 | 8.2 | 11/2/2017 20:00 | 11/3/2017 3:40 | 7.75 | 0.4466 | 0.55 | 12459 |
| 11/3/2017 3:40 | 11/3/2017 14:55 | 11.25 | 0.29 | 0.0258 | 0.12 | 6.4 | 11/3/2017 3:40 | 11/4/2017 2:55 | 23.3333 | 0.4624 | 0.55 | 38844.06 |
| 11/4/2017 13:00 | 11/5/2017 18:25 | 29.4167 | 1.22 | 0.0415 | 0.24 | 22.4 | 11/4/2017 12:55 | 11/6/2017 6:20 | 41.5 | 0.7762 | 1.42 | 115958.9 |
| 11/8/2017 16:55 | 11/8/2017 20:15 | 3.3333 | 0.08 | 0.024 | 0.12 | 72.7 | 11/8/2017 16:50 | 11/9/2017 6:40 | 13.9167 | 0.3702 | 0.41 | 18549 |
| 11/9/2017 6:40 | 11/10/2017 1:40 | 19 | 0.42 | 0.0221 | 0.36 | 12.9 | 11/9/2017 6:40 | 11/10/2017 13:40 | 31.0833 | 0.4799 | 0.94 | 53700.09 |
| 11/11/2017 9:10 | 11/11/2017 16:25 | 7.25 | 0.09 | 0.0124 | 0.12 | 37.1 | 11/11/2017 9:10 | 11/11/2017 23:55 | 14.8333 | 0.3704 | 0.41 | 19781.99 |
| 11/11/2017 23:55 | 11/12/2017 8:00 | 8.0833 | 0.38 | 0.047 | 0.24 | 8.8 | 11/11/2017 23:55 | 11/12/2017 14:45 | 14.9167 | 0.5994 | 1.01 | 32190.02 |
| 11/12/2017 14:45 | 11/13/2017 7:45 | 17 | 0.4 | 0.0235 | 0.36 | 7.3 | 11/12/2017 14:45 | 11/13/2017 15:30 | 24.8333 | 0.5909 | 0.8 | 52827.04 |
| 11/13/2017 15:35 | 11/13/2017 18:05 | 2.5 | 0.22 | 0.088 | 0.24 | 8.9 | 11/13/2017 15:30 | 11/14/2017 6:00 | 14.5833 | 0.5754 | 0.87 | 30206.96 |
| 11/14/2017 22:15 | 11/15/2017 11:10 | 12.9167 | 0.53 | 0.041 | 0.24 | 29.1 | 11/14/2017 22:15 | 11/15/2017 23:10 | 25 | 0.6079 | 1.09 | 54711.05 |
| 11/16/2017 2:05 | 11/16/2017 14:05 | 12 | 0.2 | 0.0167 | 0.12 | 17.8 | 11/16/2017 2:00 | 11/17/2017 2:05 | 24.0833 | 0.4668 | 0.55 | 40607.96 |
| 11/19/2017 15:55 | 11/20/2017 17:05 | 25.1667 | 0.98 | 0.0389 | 1.08 | 76.1 | 11/19/2017 15:55 | 11/21/2017 5:00 | 37.1667 | 0.7006 | 2.29 | 93743.77 |
| 11/21/2017 5:05 | 11/22/2017 8:10 | 27.0833 | 1.68 | 0.062 | 0.36 | 12.8 | 11/21/2017 5:00 | 11/22/2017 12:50 | 31.8333 | 1.5543 | 3.73 | 178590.2 |
| 11/22/2017 12:50 | 11/22/2017 13:00 | 0.1667 | 0.03 | 0.18 | 0.24 | 10.6 | 11/22/2017 12:45 | 11/22/2017 20:35 | 7.9167 | 0.8879 | 1.01 | 25038.01 |
| 11/22/2017 20:40 | 11/23/2017 2:25 | 5.75 | 0.55 | 0.0957 | 1.32 | 12.5 | 11/22/2017 20:35 | 11/23/2017 8:25 | 11.9167 | 1.5619 | 3.26 | 67004.99 |
| 11/23/2017 8:25 | 11/23/2017 17:45 | 9.3333 | 0.4 | 0.0429 | 0.48 | 8 | 11/23/2017 8:25 | 11/24/2017 5:45 | 21.4167 | 1.353 | 2.55 | 104316 |
| 11/24/2017 15:50 | 11/24/2017 18:35 | 2.75 | 0.06 | 0.0218 | 0.12 | 27 | 11/24/2017 15:45 | 11/25/2017 6:30 | 14.8333 | 0.6117 | 0.67 | 32664.05 |
| 11/25/2017 15:45 | 11/26/2017 2:20 | 10.5833 | 0.22 | 0.0208 | 0.12 | 22.7 | 11/25/2017 15:40 | 11/26/2017 4:50 | 13.25 | 0.5851 | 0.73 | 27909.03 |
| 11/26/2017 4:50 | 11/26/2017 19:55 | 15.0833 | 0.71 | 0.0471 | 0.48 | 8.2 | 11/26/2017 4:50 | 11/27/2017 7:50 | 27.0833 | 0.8949 | 2.29 | 87249.11 |
| 11/28/2017 6:00 | 11/28/2017 16:15 | 10.25 | 0.98 | 0.0956 | 0.36 | 35.1 | 11/28/2017 5:55 | 11/29/2017 4:15 | 22.4167 | 1.3058 | 2.42 | 105378.1 |
| 11/29/2017 10:00 | 11/29/2017 11:50 | 1.8333 | 0.05 | 0.0273 | 0.12 | 18.3 | 11/29/2017 9:55 | 11/29/2017 23:45 | 13.9167 | 0.7513 | 0.87 | 37416.03 |
| 11/30/2017 6:25 | 11/30/2017 11:00 | 4.5833 | 0.36 | 0.0785 | 0.24 | 19.6 | 11/30/2017 6:20 | 11/30/2017 23:00 | 16.75 | 0.9502 | 1.6 | 57299.99 |
| 12/1/2017 14:55 | 12/1/2017 19:00 | 4.0833 | 0.13 | 0.0318 | 0.12 | 28.8 | 12/1/2017 14:55 | 12/2/2017 7:00 | 16.0833 | 0.6487 | 0.73 | 37752 |
| 12/2/2017 10:15 | 12/3/2017 1:00 | 14.75 | 0.7 | 0.0475 | 0.12 | 15.7 | 12/2/2017 10:15 | 12/3/2017 12:55 | 26.75 | 1.1624 | 1.51 | 111939.2 |
| 12/15/2017 20:50 | 12/15/2017 21:35 | 0.75 | 0.22 | 0.2933 | 0.48 | 309.7 | 12/15/2017 20:45 | 12/16/2017 9:30 | 12.8333 | 0.4483 | 0.61 | 20712.02 |
| 12/16/2017 20:45 | 12/17/2017 3:05 | 6.3333 | 0.09 | 0.0142 | 0.12 | 23.4 | 12/16/2017 20:45 | 12/17/2017 6:55 | 10.25 | 0.4307 | 0.5 | 15894.01 |
| 12/17/2017 6:55 | 12/17/2017 9:00 | 2.0833 | 0.03 | 0.0144 | 0.12 | 8.8 | 12/17/2017 6:55 | 12/17/2017 20:55 | 14.0833 | 0.41 | 0.41 | 20787.01 |
| 12/18/2017 4:45 | 12/19/2017 12:25 | 31.6667 | 2.02 | 0.0638 | 0.24 | 25.7 | 12/18/2017 4:40 | 12/19/2017 23:35 | 43 | 1.3707 | 3.11 | 212180.9 |
| 12/19/2017 23:35 | 12/20/2017 5:10 | 5.5833 | 0.18 | 0.0322 | 0.24 | 11.6 | 12/19/2017 23:35 | 12/20/2017 17:10 | 17.6667 | 1.1283 | 1.51 | 71756.93 |
| 12/22/2017 0:50 | 12/22/2017 9:20 | 8.5 | 0.14 | 0.0165 | 0.12 | 46.2 | 12/22/2017 0:45 | 12/22/2017 21:20 | 20.6667 | 0.5749 | 0.61 | 42774.09 |
| 12/25/2017 14:10 | 12/25/2017 16:10 | 2 | 0.06 | 0.03 | 0.12 | 79.7 | 12/25/2017 14:10 | 12/26/2017 4:05 | 14 | 0.4102 | 0.45 | 20676.01 |
| 12/26/2017 11:20 | 12/26/2017 15:10 | 3.8333 | 0.26 | 0.0678 | 0.24 | 20.2 | 12/26/2017 11:15 | 12/27/2017 3:10 | 16 | 0.41 | 0.41 | 23616.03 |
| 12/27/2017 11:10 | 12/27/2017 11:10 | 0 | 0.02 | 0 | 0.24 | 20.8 | 12/27/2017 11:10 | 12/27/2017 23:10 | 12.0833 | 0.41 | 0.41 | 17834.99 |

Table D-10. Summary Statistics for Individual Storm Events at the SEIMS Station.

| Precipitation Start Time | Precipitation Stop Time | Precipitation Duration (hour) | Precipitation Depth (inch) | Precipitation Average Intensity (inch/hour) | Precipitation Maximum Intensity (inch/hour) | Precipitation Antecedent Dry Period (hour) | Flow Start Time | Flow Stop Time | Flow Duration (hour) | Average Flow Rate (feet ³ /second) | Maximum Flow Rate (feet ³ /second) | Flow Volume (feet ³) |
|--------------------------|-------------------------|-------------------------------|----------------------------|---|---|--|------------------|------------------|----------------------|---|---|----------------------------------|
| 12/28/2017 6:40 | 12/28/2017 10:25 | 3.75 | 0.11 | 0.0293 | 0.24 | 40.2 | 12/28/2017 6:40 | 12/28/2017 19:15 | 12.6667 | 0.4997 | 0.55 | 22784.97 |
| 12/28/2017 19:15 | 12/29/2017 20:50 | 25.5833 | 1.57 | 0.0614 | 0.24 | 11.8 | 12/28/2017 19:15 | 12/30/2017 8:45 | 37.5833 | 1.5712 | 3.26 | 212583.2 |
| 12/30/2017 11:40 | 12/30/2017 14:35 | 2.9167 | 0.03 | 0.0103 | 0.12 | 20.8 | 12/30/2017 11:35 | 12/31/2017 2:35 | 15.0833 | 0.7819 | 0.94 | 42456.05 |
| 1/4/2018 22:25 | 1/5/2018 17:50 | 19.4167 | 0.42 | 0.0216 | 0.36 | 151.5 | 1/4/2018 22:25 | 1/5/2018 23:55 | 25.5833 | 0.5176 | 0.67 | 47673.05 |
| 1/5/2018 23:55 | 1/6/2018 13:40 | 13.75 | 0.71 | 0.0516 | 0.24 | 8.6 | 1/5/2018 23:55 | 1/7/2018 1:40 | 25.8333 | 0.9061 | 1.25 | 84264 |
| 1/7/2018 4:45 | 1/8/2018 5:55 | 25.1667 | 0.73 | 0.029 | 0.12 | 16.1 | 1/7/2018 4:45 | 1/8/2018 17:55 | 37.25 | 1.0399 | 1.6 | 139761.2 |
| 1/8/2018 19:55 | 1/9/2018 23:00 | 27.0833 | 1.39 | 0.0513 | 0.36 | 19.4 | 1/8/2018 19:50 | 1/10/2018 11:00 | 39.25 | 1.6508 | 3.41 | 233261.7 |
| 1/10/2018 13:30 | 1/11/2018 13:35 | 24.0833 | 1.2 | 0.0498 | 0.36 | 16 | 1/10/2018 13:30 | 1/11/2018 19:25 | 30 | 1.9334 | 4.77 | 209391 |
| 1/11/2018 19:30 | 1/12/2018 6:55 | 11.4167 | 0.15 | 0.0131 | 0.24 | 6.7 | 1/11/2018 19:25 | 1/12/2018 17:00 | 21.6667 | 1.7164 | 2.42 | 133878.1 |
| 1/12/2018 17:05 | 1/13/2018 0:05 | 7 | 0.18 | 0.0257 | 0.24 | 17.5 | 1/12/2018 17:00 | 1/13/2018 12:00 | 19.0833 | 1.1343 | 1.33 | 77924.88 |
| 1/15/2018 21:25 | 1/16/2018 6:35 | 9.1667 | 0.24 | 0.0262 | 0.12 | 71.2 | 1/15/2018 21:25 | 1/16/2018 18:30 | 21.25 | 0.6895 | 0.8 | 52749.04 |
| 1/17/2018 14:45 | 1/18/2018 5:30 | 14.75 | 1.18 | 0.08 | 0.48 | 32.8 | 1/17/2018 14:45 | 1/18/2018 13:15 | 22.5833 | 1.4371 | 2.16 | 116838 |
| 1/18/2018 13:15 | 1/18/2018 17:25 | 4.1667 | 0.17 | 0.0408 | 0.24 | 7.9 | 1/18/2018 13:15 | 1/19/2018 5:25 | 16.25 | 1.2513 | 1.51 | 73202.94 |
| 1/19/2018 11:50 | 1/19/2018 15:25 | 3.5833 | 0.07 | 0.0195 | 0.12 | 19.5 | 1/19/2018 11:45 | 1/19/2018 21:55 | 10.25 | 0.936 | 1.01 | 34539.03 |
| 1/19/2018 21:55 | 1/20/2018 16:40 | 18.75 | 0.1 | 0.0053 | 0.12 | 7.3 | 1/19/2018 21:55 | 1/21/2018 4:40 | 30.8333 | 0.7972 | 0.87 | 88485.21 |
| 1/21/2018 7:00 | 1/21/2018 11:45 | 4.75 | 0.11 | 0.0232 | 0.24 | 19 | 1/21/2018 6:55 | 1/21/2018 15:20 | 8.5 | 0.7547 | 0.8 | 23094.01 |
| 1/21/2018 15:25 | 1/22/2018 5:35 | 14.1667 | 0.31 | 0.0219 | 0.24 | 7.2 | 1/21/2018 15:20 | 1/22/2018 17:35 | 26.3333 | 0.7692 | 0.94 | 72920.98 |
| 1/23/2018 8:55 | 1/24/2018 2:55 | 18 | 0.8 | 0.0444 | 0.24 | 27.5 | 1/23/2018 8:55 | 1/24/2018 7:30 | 22.75 | 1.226 | 1.93 | 100038.1 |
| 1/24/2018 7:35 | 1/25/2018 1:10 | 17.5833 | 0.4 | 0.0227 | 0.24 | 6.8 | 1/24/2018 7:35 | 1/25/2018 11:25 | 27.9167 | 1.1889 | 1.81 | 119844.2 |
| 1/25/2018 11:30 | 1/25/2018 23:25 | 11.9167 | 0.12 | 0.0101 | 0.12 | 12.6 | 1/25/2018 11:25 | 1/26/2018 9:10 | 21.8333 | 0.9357 | 1.17 | 73547.98 |
| 1/26/2018 9:15 | 1/26/2018 9:55 | 0.6667 | 0.03 | 0.045 | 0.12 | 14.3 | 1/26/2018 9:10 | 1/26/2018 17:10 | 8.0833 | 0.8022 | 0.87 | 23343 |
| 1/26/2018 17:10 | 1/27/2018 11:40 | 18.5 | 0.54 | 0.0292 | 0.24 | 22.2 | 1/26/2018 17:10 | 1/27/2018 23:35 | 30.5 | 1.002 | 1.42 | 110024.9 |
| 1/27/2018 23:45 | 1/28/2018 2:15 | 2.5 | 0.06 | 0.024 | 0.12 | 13.6 | 1/27/2018 23:45 | 1/28/2018 14:10 | 14.5 | 0.8616 | 0.94 | 44973.08 |
| 1/29/2018 7:55 | 1/29/2018 16:55 | 9 | 0.7 | 0.0778 | 0.36 | 32.1 | 1/29/2018 7:55 | 1/30/2018 4:50 | 21 | 1.459 | 2.82 | 110736.1 |
| 1/30/2018 12:50 | 1/30/2018 13:10 | 0.3333 | 0.07 | 0.21 | 0.36 | 20.6 | 1/30/2018 12:45 | 1/31/2018 1:05 | 12.4167 | 0.9599 | 1.09 | 42909.02 |
| 1/31/2018 7:50 | 1/31/2018 13:55 | 6.0833 | 0.04 | 0.0066 | 0.12 | 18.8 | 1/31/2018 7:50 | 2/1/2018 1:50 | 18.0833 | 0.8039 | 0.87 | 52332.05 |
| 2/1/2018 8:30 | 2/2/2018 16:35 | 32.0833 | 0.96 | 0.0299 | 0.24 | 43.4 | 2/1/2018 8:25 | 2/2/2018 22:25 | 38.0833 | 1.2618 | 2.04 | 172620.1 |
| 2/2/2018 22:25 | 2/3/2018 0:00 | 1.5833 | 0.03 | 0.0189 | 0.12 | 7.1 | 2/2/2018 22:25 | 2/3/2018 11:55 | 13.6667 | 1.0161 | 1.09 | 49686.05 |
| 2/3/2018 14:10 | 2/4/2018 12:10 | 22 | 1 | 0.0455 | 0.24 | 22.8 | 2/3/2018 14:10 | 2/5/2018 0:10 | 34.0833 | 1.7711 | 3.26 | 217311 |
| 2/5/2018 4:10 | 2/5/2018 6:55 | 2.75 | 0.04 | 0.0145 | 0.12 | 19.1 | 2/5/2018 4:05 | 2/5/2018 17:10 | 13.1667 | 1.1265 | 1.25 | 53393.88 |
| 2/5/2018 17:10 | 2/6/2018 6:20 | 13.1667 | 0.6 | 0.0456 | 0.24 | 13 | 2/5/2018 17:10 | 2/6/2018 15:20 | 22.25 | 1.583 | 2.16 | 126795 |
| 2/6/2018 15:20 | 2/7/2018 1:20 | 10 | 0.09 | 0.009 | 0.12 | 12.2 | 2/6/2018 15:20 | 2/7/2018 13:15 | 22 | 1.1733 | 1.33 | 92927.92 |
| 2/8/2018 13:40 | 2/8/2018 20:35 | 6.9167 | 0.18 | 0.026 | 0.24 | 40.7 | 2/8/2018 13:40 | 2/9/2018 7:05 | 17.5 | 0.9743 | 1.33 | 61382.96 |
| 2/9/2018 7:10 | 2/9/2018 9:00 | 1.8333 | 0.03 | 0.0164 | 0.12 | 13.5 | 2/9/2018 7:05 | 2/9/2018 20:55 | 13.9167 | 0.8407 | 0.87 | 42117.07 |
| 2/13/2018 21:05 | 2/14/2018 13:10 | 16.0833 | 0.48 | 0.0298 | 0.24 | 123.4 | 2/13/2018 21:00 | 2/15/2018 1:05 | 28.1667 | 0.7582 | 1.09 | 76884.02 |
| 2/16/2018 1:55 | 2/17/2018 11:20 | 33.4167 | 0.92 | 0.0275 | 0.24 | 39.4 | 2/16/2018 1:55 | 2/17/2018 23:20 | 45.4167 | 0.8194 | 1.01 | 134469 |
| 2/22/2018 10:50 | 2/22/2018 10:55 | 0.0833 | 0.04 | 0.4802 | 0.36 | 122 | 2/22/2018 10:50 | 2/22/2018 22:50 | 12.0833 | 0.5017 | 0.55 | 21825 |
| 2/24/2018 4:40 | 2/24/2018 8:10 | 3.5 | 0.1 | 0.0286 | 0.12 | 41.8 | 2/24/2018 4:40 | 2/24/2018 20:10 | 15.5833 | 0.576 | 0.61 | 32316.02 |
| 2/24/2018 23:30 | 2/25/2018 3:00 | 3.5 | 0.04 | 0.0114 | 0.12 | 18.1 | 2/24/2018 23:25 | 2/25/2018 10:50 | 11.5 | 0.55 | 0.55 | 22770 |
| 2/25/2018 10:55 | 2/25/2018 13:00 | 2.0833 | 0.2 | 0.096 | 0.24 | 11.4 | 2/25/2018 10:50 | 2/26/2018 0:55 | 14.1667 | 0.6927 | 0.87 | 35327.99 |
| 2/26/2018 10:15 | 2/26/2018 13:25 | 3.1667 | 0.57 | 0.18 | 0.48 | 21.9 | 2/26/2018 10:15 | 2/27/2018 1:25 | 15.25 | 0.6721 | 0.8 | 36896.98 |
| 2/27/2018 15:00 | 2/28/2018 2:00 | 11 | 0.16 | 0.0145 | 0.24 | 25.7 | 2/27/2018 14:55 | 2/28/2018 13:40 | 22.8333 | 0.7278 | 0.94 | 59826 |
| 2/28/2018 13:45 | 3/1/2018 3:40 | 13.9167 | 0.45 | 0.0323 | 0.12 | 15.7 | 2/28/2018 13:40 | 3/1/2018 15:40 | 26.0833 | 0.9322 | 1.25 | 87536.82 |
| 3/2/2018 1:55 | 3/2/2018 6:10 | 4.25 | 0.29 | 0.0682 | 0.24 | 24.2 | 3/2/2018 1:55 | 3/2/2018 18:10 | 16.3333 | 0.8862 | 1.09 | 52377.06 |

Table D-10. Summary Statistics for Individual Storm Events at the SEIMS Station.

| Precipitation Start Time | Precipitation Stop Time | Precipitation Duration (hour) | Precipitation Depth (inch) | Precipitation Average Intensity (inch/hour) | Precipitation Maximum Intensity (inch/hour) | Precipitation Antecedent Dry Period (hour) | Flow Start Time | Flow Stop Time | Flow Duration (hour) | Average Flow Rate (feet ³ /second) | Maximum Flow Rate (feet ³ /second) | Flow Volume (feet ³) |
|--------------------------|-------------------------|-------------------------------|----------------------------|---|---|--|-----------------|-----------------|----------------------|---|---|----------------------------------|
| 3/4/2018 14:45 | 3/4/2018 16:30 | 1.75 | 0.13 | 0.0743 | 0.36 | 57.2 | 3/4/2018 14:45 | 3/5/2018 0:40 | 10 | 0.7136 | 0.94 | 25688.98 |
| 3/5/2018 0:40 | 3/5/2018 9:05 | 8.4167 | 0.14 | 0.0166 | 0.24 | 8.3 | 3/5/2018 0:40 | 3/5/2018 21:00 | 20.5 | 0.6171 | 0.8 | 45360.02 |
| 3/7/2018 22:40 | 3/7/2018 23:35 | 0.9167 | 0.05 | 0.0545 | 0.12 | 61.9 | 3/7/2018 22:40 | 3/8/2018 7:40 | 9.0833 | 0.5577 | 0.61 | 18236.98 |
| 3/8/2018 7:45 | 3/8/2018 18:30 | 10.75 | 0.67 | 0.0623 | 0.24 | 8.7 | 3/8/2018 7:40 | 3/9/2018 4:15 | 20.6667 | 0.9051 | 1.42 | 67340.92 |
| 3/9/2018 4:20 | 3/9/2018 5:50 | 1.5 | 0.1 | 0.0667 | 0.12 | 10.2 | 3/9/2018 4:15 | 3/9/2018 17:45 | 13.5833 | 0.696 | 0.8 | 34034.96 |
| 3/13/2018 14:00 | 3/13/2018 18:50 | 4.8333 | 0.31 | 0.0641 | 0.12 | 105.2 | 3/13/2018 14:00 | 3/14/2018 5:25 | 15.5 | 0.6545 | 1.01 | 36522.03 |
| 3/14/2018 5:25 | 3/14/2018 7:55 | 2.5 | 0.09 | 0.036 | 0.24 | 11.1 | 3/14/2018 5:25 | 3/14/2018 19:50 | 14.5 | 0.5841 | 0.67 | 30492.06 |
| 3/21/2018 22:40 | 3/23/2018 0:50 | 26.1667 | 0.54 | 0.0206 | 0.24 | 184.1 | 3/21/2018 22:40 | 3/23/2018 5:40 | 31 | 0.531 | 0.8 | 59415 |

Table D-11. Summary Statistics for Individual Storm Events at the COUMO Station.

| Precipitation Start Time | Precipitation Stop Time | Precipitation Duration (hour) | Precipitation Depth (inch) | Precipitation Average Intensity (inch/hour) | Precipitation Maximum Intensity (inch/hour) | Precipitation Antecedent Dry Period (hour) | Flow Start Time | Flow Stop Time | Flow Duration (hour) | Average Flow Rate (feet ³ /second) | Maximum Flow Rate (feet ³ /second) | Flow Volume (feet ³) |
|--------------------------|-------------------------|-------------------------------|----------------------------|---|---|--|------------------|------------------|----------------------|---|---|----------------------------------|
| 12/26/2017 10:25 | 12/26/2017 13:35 | 3.1667 | 0.12 | 0.0379 | 0.12 | 19.7 | 12/26/2017 10:25 | 12/27/2017 1:30 | 15.1667 | 0.2563 | 0.29 | 13995.03 |
| 12/28/2017 5:10 | 12/28/2017 10:30 | 5.3333 | 0.03 | 0.0056 | 0.12 | 40.3 | 12/28/2017 5:10 | 12/28/2017 19:15 | 14.1667 | 0.2514 | 0.29 | 12821.02 |
| 12/28/2017 19:15 | 12/29/2017 13:50 | 18.5833 | 1.48 | 0.0796 | 0.24 | 54.4 | 12/28/2017 19:15 | 12/30/2017 1:50 | 30.6667 | 2.7804 | 7.23 | 306951.7 |
| 1/4/2018 22:25 | 1/5/2018 17:30 | 19.0833 | 0.4 | 0.021 | 0.24 | 153.3 | 1/4/2018 22:25 | 1/5/2018 23:25 | 25.0833 | 0.5573 | 1.78 | 50328 |
| 1/5/2018 23:25 | 1/6/2018 13:45 | 14.3333 | 0.49 | 0.0342 | 0.24 | 10.2 | 1/5/2018 23:25 | 1/7/2018 1:40 | 26.3333 | 0.8963 | 1.78 | 84971.97 |
| 1/7/2018 6:20 | 1/8/2018 1:50 | 19.5 | 0.58 | 0.0297 | 0.12 | 18.2 | 1/7/2018 6:20 | 1/8/2018 13:50 | 31.5833 | 1.0641 | 2.32 | 120987.1 |
| 1/8/2018 19:35 | 1/10/2018 3:00 | 31.4167 | 1.16 | 0.0369 | 0.48 | 21.2 | 1/8/2018 19:30 | 1/10/2018 13:40 | 42.25 | 1.9183 | 6.34 | 291770.9 |
| 1/10/2018 13:45 | 1/11/2018 13:15 | 23.5 | 1.02 | 0.0434 | 0.36 | 16.4 | 1/10/2018 13:40 | 1/11/2018 20:55 | 31.3333 | 2.2499 | 8.55 | 253787.9 |
| 1/11/2018 20:55 | 1/11/2018 23:55 | 3 | 0.14 | 0.0467 | 0.12 | 8.2 | 1/11/2018 20:55 | 1/12/2018 11:55 | 15.0833 | 1.7122 | 3.13 | 92972.99 |
| 1/12/2018 16:45 | 1/13/2018 2:05 | 9.3333 | 0.2 | 0.0214 | 0.12 | 17.9 | 1/12/2018 16:40 | 1/13/2018 14:00 | 21.4167 | 1.178 | 2.32 | 90822.21 |
| 1/15/2018 21:05 | 1/16/2018 5:55 | 8.8333 | 0.23 | 0.026 | 0.12 | 72.3 | 1/15/2018 21:00 | 1/16/2018 17:55 | 21 | 0.5663 | 1.05 | 42815.96 |
| 1/17/2018 5:45 | 1/17/2018 7:15 | 1.5 | 0.03 | 0.02 | 0.12 | 24.4 | 1/17/2018 5:45 | 1/17/2018 14:45 | 9.0833 | 0.3044 | 0.39 | 9954.001 |
| 1/17/2018 14:50 | 1/18/2018 5:35 | 14.75 | 1.22 | 0.0827 | 0.6 | 33.5 | 1/17/2018 14:45 | 1/18/2018 14:10 | 23.5 | 2.3203 | 6.34 | 196295.9 |
| 1/18/2018 14:15 | 1/18/2018 20:05 | 5.8333 | 0.21 | 0.036 | 0.36 | 9 | 1/18/2018 14:10 | 1/19/2018 8:00 | 17.9167 | 1.2943 | 3.5 | 83484.1 |
| 1/19/2018 12:10 | 1/19/2018 14:35 | 2.4167 | 0.03 | 0.0124 | 0.12 | 19.9 | 1/19/2018 12:10 | 1/19/2018 21:40 | 9.5833 | 0.6689 | 0.78 | 23075.98 |
| 1/19/2018 21:40 | 1/20/2018 16:20 | 18.6667 | 0.09 | 0.0048 | 0.12 | 29.4 | 1/19/2018 21:40 | 1/21/2018 4:15 | 30.6667 | 0.4521 | 0.69 | 49913.91 |
| 1/21/2018 6:40 | 1/21/2018 11:40 | 5 | 0.08 | 0.016 | 0.12 | 27.3 | 1/21/2018 6:40 | 1/21/2018 15:10 | 8.5833 | 0.399 | 0.78 | 12330.01 |
| 1/21/2018 15:10 | 1/21/2018 19:00 | 3.8333 | 0.16 | 0.0417 | 0.36 | 7.2 | 1/21/2018 15:10 | 1/22/2018 0:55 | 9.8333 | 0.5652 | 1.91 | 20007 |
| 1/22/2018 0:55 | 1/22/2018 5:30 | 4.5833 | 0.13 | 0.0284 | 0.24 | 8.1 | 1/22/2018 0:55 | 1/22/2018 17:30 | 16.6667 | 0.4579 | 1.24 | 27471.03 |
| 1/23/2018 8:20 | 1/24/2018 2:45 | 18.4167 | 0.86 | 0.0467 | 0.36 | 27.2 | 1/23/2018 8:15 | 1/24/2018 7:30 | 23.3333 | 1.4241 | 3.7 | 119622 |
| 1/24/2018 7:30 | 1/24/2018 23:50 | 16.3333 | 0.42 | 0.0257 | 0.24 | 6.8 | 1/24/2018 7:30 | 1/25/2018 10:05 | 26.6667 | 1.368 | 2.96 | 131331 |
| 1/25/2018 10:10 | 1/25/2018 18:55 | 8.75 | 0.12 | 0.0137 | 0.12 | 14.9 | 1/25/2018 10:05 | 1/26/2018 6:55 | 20.9167 | 0.8033 | 1.34 | 60486.09 |
| 1/26/2018 9:05 | 1/26/2018 11:45 | 2.6667 | 0.03 | 0.0112 | 0.12 | 20.4 | 1/26/2018 9:00 | 1/26/2018 18:00 | 9.0833 | 0.4788 | 0.6 | 15657.01 |
| 1/26/2018 18:05 | 1/27/2018 11:15 | 17.1667 | 0.53 | 0.0309 | 0.24 | 29.4 | 1/26/2018 18:00 | 1/27/2018 23:10 | 29.25 | 0.9912 | 2.32 | 104373.1 |
| 1/27/2018 23:25 | 1/28/2018 7:10 | 7.75 | 0.11 | 0.0142 | 0.24 | 13.4 | 1/27/2018 23:25 | 1/28/2018 19:05 | 19.75 | 0.5996 | 1.24 | 42632.95 |
| 1/29/2018 7:00 | 1/29/2018 16:45 | 9.75 | 0.82 | 0.0841 | 0.36 | 30.8 | 1/29/2018 6:55 | 1/30/2018 4:40 | 21.8333 | 1.9232 | 6.34 | 151166.9 |
| 2/1/2018 9:05 | 2/3/2018 2:15 | 41.1667 | 0.88 | 0.0214 | 0.24 | 64.8 | 2/1/2018 9:00 | 2/3/2018 14:05 | 53.1667 | 1.0233 | 3.13 | 195858 |
| 2/3/2018 14:05 | 2/3/2018 23:55 | 9.8333 | 0.61 | 0.062 | 0.24 | 22.3 | 2/3/2018 14:05 | 2/4/2018 5:15 | 15.25 | 1.7787 | 4.11 | 97653.03 |
| 2/4/2018 5:15 | 2/4/2018 12:10 | 6.9167 | 0.06 | 0.0087 | 0.12 | 7.5 | 2/4/2018 5:15 | 2/5/2018 0:10 | 19 | 0.8945 | 1.24 | 61182.02 |
| 2/5/2018 17:10 | 2/6/2018 1:40 | 8.5 | 0.21 | 0.0247 | 0.12 | 33.8 | 2/5/2018 17:10 | 2/6/2018 13:40 | 20.5833 | 0.7 | 1.34 | 51867.05 |
| 2/8/2018 17:05 | 2/8/2018 19:25 | 2.3333 | 0.23 | 0.0986 | 0.36 | 65.5 | 2/8/2018 17:00 | 2/9/2018 7:25 | 14.5 | 0.5426 | 1.91 | 28326 |
| 2/9/2018 20:50 | 2/9/2018 22:15 | 1.4167 | 0.03 | 0.0212 | 0.12 | 26.2 | 2/9/2018 20:50 | 2/10/2018 10:15 | 13.5 | 0.307 | 0.33 | 14922.02 |
| 2/13/2018 20:50 | 2/14/2018 13:10 | 16.3333 | 0.46 | 0.0282 | 0.24 | 122.2 | 2/13/2018 20:45 | 2/15/2018 1:05 | 28.4167 | 0.5983 | 1.66 | 61208.96 |
| 2/15/2018 12:15 | 2/15/2018 12:40 | 0.4167 | 0.03 | 0.072 | 0.24 | 24.7 | 2/15/2018 12:15 | 2/16/2018 0:40 | 12.5 | 0.2395 | 0.29 | 10776 |
| 2/16/2018 1:50 | 2/16/2018 6:30 | 4.6667 | 0.22 | 0.0471 | 0.12 | 38.2 | 2/16/2018 1:50 | 2/16/2018 14:00 | 12.25 | 0.5288 | 1.44 | 23322.01 |
| 2/16/2018 14:00 | 2/16/2018 18:00 | 4 | 0.04 | 0.01 | 0.12 | 10.1 | 2/16/2018 14:00 | 2/17/2018 0:30 | 10.5833 | 0.2791 | 0.33 | 10635.01 |
| 2/17/2018 0:30 | 2/17/2018 10:25 | 9.9167 | 0.2 | 0.0202 | 0.24 | 10.5 | 2/17/2018 0:30 | 2/17/2018 22:25 | 22 | 0.4558 | 1.44 | 36101.99 |
| 2/22/2018 10:00 | 2/22/2018 10:25 | 0.4167 | 0.04 | 0.096 | 0.24 | 121.2 | 2/22/2018 9:55 | 2/22/2018 22:25 | 12.5833 | 0.2877 | 0.33 | 13033.02 |
| 2/24/2018 4:45 | 2/24/2018 8:50 | 4.0833 | 0.12 | 0.0294 | 0.12 | 42.8 | 2/24/2018 4:40 | 2/24/2018 20:45 | 16.1667 | 0.3441 | 0.89 | 20028.03 |
| 2/25/2018 0:05 | 2/25/2018 4:45 | 4.6667 | 0.04 | 0.0086 | 0.12 | 15.6 | 2/25/2018 0:00 | 2/25/2018 11:10 | 11.25 | 0.2432 | 0.39 | 9848.997 |
| 2/25/2018 11:10 | 2/25/2018 12:00 | 0.8333 | 0.06 | 0.072 | 0.12 | 11.1 | 2/25/2018 11:10 | 2/25/2018 23:55 | 12.8333 | 0.5955 | 1.24 | 27512.99 |
| 2/26/2018 9:40 | 2/26/2018 16:00 | 6.3333 | 0.59 | 0.0932 | 0.24 | 22.3 | 2/26/2018 9:40 | 2/27/2018 3:55 | 18.3333 | 0.7751 | 1.44 | 51156.04 |
| 2/27/2018 15:20 | 2/27/2018 21:15 | 5.9167 | 0.22 | 0.0372 | 0.12 | 23.8 | 2/27/2018 15:20 | 2/28/2018 9:10 | 17.9167 | 0.8754 | 2.18 | 56460.09 |
| 2/28/2018 13:05 | 3/1/2018 1:40 | 12.5833 | 0.4 | 0.0318 | 0.12 | 16.2 | 2/28/2018 13:05 | 3/1/2018 13:40 | 24.6667 | 0.8591 | 1.55 | 76287.11 |

Table D-11. Summary Statistics for Individual Storm Events at the COUMO Station.

| Precipitation Start Time | Precipitation Stop Time | Precipitation Duration (hour) | Precipitation Depth (inch) | Precipitation Average Intensity (inch/hour) | Precipitation Maximum Intensity (inch/hour) | Precipitation Antecedent Dry Period (hour) | Flow Start Time | Flow Stop Time | Flow Duration (hour) | Average Flow Rate (feet ³ /second) | Maximum Flow Rate (feet ³ /second) | Flow Volume (feet ³) |
|--------------------------|-------------------------|-------------------------------|----------------------------|---|---|--|-----------------|-----------------|----------------------|---|---|----------------------------------|
| 3/2/2018 1:35 | 3/2/2018 6:05 | 4.5 | 0.23 | 0.0511 | 0.24 | 27.4 | 3/2/2018 1:30 | 3/2/2018 18:00 | 16.5833 | 0.8381 | 1.78 | 50034.08 |
| 3/4/2018 15:50 | 3/4/2018 17:40 | 1.8333 | 0.12 | 0.0655 | 0.48 | 58.6 | 3/4/2018 15:45 | 3/5/2018 5:35 | 13.9167 | 0.4075 | 0.97 | 20417 |
| 3/5/2018 7:40 | 3/5/2018 8:25 | 0.75 | 0.04 | 0.0533 | 0.12 | 15.7 | 3/5/2018 7:40 | 3/5/2018 20:25 | 12.8333 | 0.3327 | 0.39 | 15372.02 |
| 3/7/2018 22:45 | 3/7/2018 23:35 | 0.8333 | 0.05 | 0.06 | 0.12 | 63.1 | 3/7/2018 22:40 | 3/8/2018 7:25 | 8.8333 | 0.3143 | 0.52 | 9996.009 |
| 3/8/2018 7:25 | 3/8/2018 20:10 | 12.75 | 0.48 | 0.0376 | 0.24 | 8.5 | 3/8/2018 7:25 | 3/9/2018 8:10 | 24.8333 | 0.7952 | 1.91 | 71095.08 |
| 3/13/2018 14:25 | 3/13/2018 19:00 | 4.5833 | 0.24 | 0.0524 | 0.12 | 115.2 | 3/13/2018 14:25 | 3/14/2018 5:20 | 15 | 0.5186 | 1.55 | 28005.03 |
| 3/14/2018 5:20 | 3/14/2018 9:45 | 4.4167 | 0.06 | 0.0136 | 0.12 | 10.8 | 3/14/2018 5:20 | 3/14/2018 21:40 | 16.4167 | 0.3525 | 0.6 | 20835.03 |
| 3/21/2018 21:25 | 3/23/2018 15:30 | 42.0833 | 0.95 | 0.0226 | 0.36 | 183.2 | 3/21/2018 21:20 | 3/23/2018 23:30 | 50.25 | 0.5971 | 3.31 | 108015.1 |
| 3/23/2018 23:30 | 3/24/2018 6:00 | 6.5 | 0.23 | 0.0354 | 0.12 | 13.2 | 3/23/2018 23:30 | 3/24/2018 18:00 | 18.5833 | 0.604 | 1.91 | 40409.94 |

Table D-12. Summary Statistics for Individual Storm Events at the COUMI Station.

| Precipitation Start Time | Precipitation Stop Time | Precipitation Duration (hour) | Precipitation Depth (inch) | Precipitation Average Intensity (inch/hour) | Precipitation Maximum Intensity (inch/hour) | Precipitation Antecedent Dry Period (hour) | Flow Start Time | Flow Stop Time | Flow Duration (hour) | Average Flow Rate (feet ³ /second) | Maximum Flow Rate (feet ³ /second) | Flow Volume (feet ³) |
|--------------------------|-------------------------|-------------------------------|----------------------------|---|---|--|-----------------|-----------------|----------------------|---|---|----------------------------------|
| 3/2/2018 1:35 | 3/2/2018 6:05 | 4.5 | 0.23 | 0.0511 | 0.24 | 27.4 | 3/2/2018 1:30 | 3/2/2018 18:00 | 16.5833 | 0.2341 | 0.46 | 13977.02 |
| 3/4/2018 15:50 | 3/4/2018 17:40 | 1.8333 | 0.12 | 0.0655 | 0.48 | 58.6 | 3/4/2018 15:45 | 3/5/2018 5:35 | 13.9167 | 0.1232 | 0.27 | 6171 |
| 3/5/2018 7:40 | 3/5/2018 8:25 | 0.75 | 0.04 | 0.0533 | 0.12 | 15.7 | 3/5/2018 7:40 | 3/5/2018 20:25 | 12.8333 | 0.1082 | 0.11 | 4997.995 |
| 3/7/2018 22:45 | 3/7/2018 23:35 | 0.8333 | 0.05 | 0.06 | 0.12 | 63.1 | 3/7/2018 22:40 | 3/8/2018 7:25 | 8.8333 | 0.0952 | 0.14 | 3027.002 |
| 3/8/2018 7:25 | 3/8/2018 20:10 | 12.75 | 0.48 | 0.0376 | 0.24 | 8.5 | 3/8/2018 7:25 | 3/9/2018 8:10 | 24.8333 | 0.2038 | 0.46 | 18215.96 |
| 3/13/2018 14:25 | 3/13/2018 19:00 | 4.5833 | 0.24 | 0.0524 | 0.12 | 115.2 | 3/13/2018 14:25 | 3/14/2018 5:20 | 15 | 0.1552 | 0.36 | 8381.998 |
| 3/14/2018 5:20 | 3/14/2018 9:45 | 4.4167 | 0.06 | 0.0136 | 0.12 | 10.8 | 3/14/2018 5:20 | 3/14/2018 21:40 | 16.4167 | 0.1109 | 0.17 | 6554.998 |
| 3/21/2018 21:25 | 3/23/2018 15:30 | 42.0833 | 0.95 | 0.0226 | 0.36 | 183.2 | 3/21/2018 21:20 | 3/23/2018 23:30 | 50.25 | 0.2042 | 1.01 | 36941.9 |
| 3/23/2018 23:30 | 3/24/2018 6:00 | 6.5 | 0.23 | 0.0354 | 0.12 | 13.2 | 3/23/2018 23:30 | 3/24/2018 18:00 | 18.5833 | 0.2184 | 0.46 | 14609.99 |

Table D-13. Summary Statistics for Individual Storm Events at the TYLMO Station.

| Precipitation Start Time | Precipitation Stop Time | Precipitation Duration (hour) | Precipitation Depth (inch) | Precipitation Average Intensity (inch/hour) | Precipitation Maximum Intensity (inch/hour) | Precipitation Antecedent Dry Period (hour) | Flow Start Time | Flow Stop Time | Flow Duration (hour) | Average Flow Rate (feet ³ /second) | Maximum Flow Rate (feet ³ /second) | Flow Volume (feet ³) |
|--------------------------|-------------------------|-------------------------------|----------------------------|---|---|--|------------------|------------------|----------------------|---|---|----------------------------------|
| 10/7/2017 13:45 | 10/8/2017 3:45 | 14.0 | 0.48 | 0.03 | 0.84 | 12.8 | 10/7/2017 13:40 | 10/8/2017 15:40 | 26.1 | 0.76 | 7.77 | 71,235 |
| 10/10/2017 12:40 | 10/10/2017 19:20 | 6.7 | 0.46 | 0.07 | 0.96 | 68.1 | 10/10/2017 12:40 | 10/11/2017 7:15 | 18.7 | 0.44 | 2.81 | 29,496 |
| 10/12/2017 7:15 | 10/12/2017 15:55 | 8.7 | 0.10 | 0.01 | 0.12 | 36.1 | 10/12/2017 7:15 | 10/12/2017 22:15 | 15.1 | 0.16 | 0.46 | 8,928 |
| 10/12/2017 22:15 | 10/13/2017 7:10 | 8.9 | 0.71 | 0.08 | 0.48 | 10.8 | 10/12/2017 22:15 | 10/13/2017 19:05 | 20.9 | 0.99 | 6.21 | 74,199 |
| 10/17/2017 6:55 | 10/17/2017 11:05 | 4.2 | 0.15 | 0.04 | 0.24 | 95.9 | 10/17/2017 6:55 | 10/17/2017 23:00 | 16.2 | 0.25 | 2.26 | 14,337 |
| 10/18/2017 9:15 | 10/19/2017 21:50 | 36.6 | 1.55 | 0.04 | 0.36 | 22.8 | 10/18/2017 9:10 | 10/20/2017 1:25 | 40.3 | 1.56 | 5.09 | 226,971 |
| 10/20/2017 1:30 | 10/20/2017 11:20 | 9.8 | 0.15 | 0.02 | 0.36 | 6.8 | 10/20/2017 1:30 | 10/20/2017 23:15 | 21.9 | 0.67 | 3.64 | 53,208 |
| 10/21/2017 2:20 | 10/22/2017 0:10 | 21.8 | 0.80 | 0.04 | 0.12 | 24.2 | 10/21/2017 2:15 | 10/22/2017 12:10 | 34.0 | 1.21 | 3.64 | 148,551 |
| 11/1/2017 6:00 | 11/1/2017 9:05 | 3.1 | 0.07 | 0.02 | 0.12 | 248.3 | 11/1/2017 5:55 | 11/1/2017 21:00 | 15.2 | 0.37 | 1.49 | 20,085 |
| 11/2/2017 9:20 | 11/2/2017 11:55 | 2.6 | 0.06 | 0.02 | 0.12 | 26.0 | 11/2/2017 9:20 | 11/2/2017 19:50 | 10.6 | 0.41 | 2.26 | 15,753 |
| 11/2/2017 19:55 | 11/3/2017 14:40 | 18.8 | 0.46 | 0.02 | 0.24 | 8.5 | 11/2/2017 19:50 | 11/4/2017 2:35 | 30.8 | 0.96 | 2.62 | 106,233 |
| 11/4/2017 12:35 | 11/5/2017 14:50 | 26.3 | 1.06 | 0.04 | 0.24 | 22.2 | 11/4/2017 12:30 | 11/6/2017 2:45 | 38.3 | 1.70 | 4.83 | 234,210 |
| 11/8/2017 15:10 | 11/9/2017 0:05 | 8.9 | 0.08 | 0.01 | 0.12 | 73.3 | 11/8/2017 15:10 | 11/9/2017 8:10 | 17.1 | 0.39 | 0.99 | 23,685 |
| 11/9/2017 8:10 | 11/9/2017 22:55 | 14.8 | 0.38 | 0.03 | 0.36 | 15.2 | 11/9/2017 8:10 | 11/10/2017 10:55 | 26.8 | 0.96 | 4.83 | 92,670 |
| 11/11/2017 8:45 | 11/11/2017 20:00 | 11.3 | 0.09 | 0.01 | 0.12 | 36.8 | 11/11/2017 8:45 | 11/12/2017 2:35 | 17.9 | 0.37 | 0.78 | 24,027 |
| 11/12/2017 2:35 | 11/12/2017 8:10 | 5.6 | 0.34 | 0.06 | 0.24 | 11.6 | 11/12/2017 2:35 | 11/12/2017 14:55 | 12.4 | 1.35 | 4.33 | 60,441 |
| 11/12/2017 14:55 | 11/13/2017 6:40 | 15.8 | 0.37 | 0.02 | 0.48 | 7.7 | 11/12/2017 14:55 | 11/13/2017 15:20 | 24.5 | 1.25 | 4.58 | 109,809 |
| 11/13/2017 15:20 | 11/13/2017 18:05 | 2.8 | 0.29 | 0.11 | 0.24 | 12.1 | 11/13/2017 15:20 | 11/14/2017 6:00 | 14.8 | 1.24 | 4.33 | 65,712 |
| 11/14/2017 22:40 | 11/15/2017 10:45 | 12.1 | 0.47 | 0.04 | 0.24 | 29.4 | 11/14/2017 22:40 | 11/15/2017 22:40 | 24.1 | 1.03 | 3.86 | 88,911 |
| 11/16/2017 2:50 | 11/16/2017 9:15 | 6.4 | 0.06 | 0.01 | 0.12 | 18.9 | 11/16/2017 2:50 | 11/16/2017 10:50 | 8.2 | 0.53 | 0.99 | 15,447 |
| 11/16/2017 10:55 | 11/16/2017 12:30 | 1.6 | 0.06 | 0.04 | 0.12 | 7.3 | 11/16/2017 10:55 | 11/17/2017 0:30 | 13.8 | 0.45 | 0.99 | 22,116 |
| 11/19/2017 15:45 | 11/20/2017 16:35 | 24.8 | 0.87 | 0.04 | 1.08 | 76.4 | 11/19/2017 15:40 | 11/21/2017 4:30 | 36.9 | 1.04 | 5.92 | 138,057 |
| 11/21/2017 5:00 | 11/22/2017 6:25 | 25.4 | 1.70 | 0.07 | 0.36 | 13.2 | 11/21/2017 5:00 | 11/22/2017 10:40 | 29.8 | 2.98 | 8.10 | 319,245 |
| 11/22/2017 10:40 | 11/22/2017 15:40 | 5.0 | 0.06 | 0.01 | 0.24 | 8.7 | 11/22/2017 10:40 | 11/22/2017 21:10 | 10.6 | 1.38 | 2.26 | 52,437 |
| 11/22/2017 21:15 | 11/23/2017 0:45 | 3.5 | 0.42 | 0.12 | 0.48 | 10.5 | 11/22/2017 21:10 | 11/23/2017 8:15 | 11.2 | 2.20 | 5.92 | 88,524 |
| 11/23/2017 8:20 | 11/23/2017 13:50 | 5.5 | 0.40 | 0.07 | 0.36 | 8.2 | 11/23/2017 8:20 | 11/24/2017 1:50 | 17.7 | 1.79 | 4.58 | 113,796 |
| 11/24/2017 15:25 | 11/24/2017 18:35 | 3.2 | 0.06 | 0.02 | 0.12 | 26.8 | 11/24/2017 15:20 | 11/25/2017 6:30 | 15.3 | 0.69 | 1.11 | 38,121 |
| 11/25/2017 16:10 | 11/26/2017 2:10 | 10.0 | 0.16 | 0.02 | 0.12 | 23.2 | 11/25/2017 16:05 | 11/26/2017 2:55 | 10.8 | 0.76 | 1.63 | 29,712 |
| 11/26/2017 2:55 | 11/26/2017 19:10 | 16.3 | 0.64 | 0.04 | 0.36 | 6.6 | 11/26/2017 2:55 | 11/27/2017 7:10 | 28.3 | 1.35 | 5.92 | 137,541 |
| 11/28/2017 5:55 | 11/28/2017 16:05 | 10.2 | 0.76 | 0.07 | 0.24 | 38.9 | 11/28/2017 5:55 | 11/29/2017 4:05 | 22.3 | 1.71 | 4.83 | 136,860 |
| 11/29/2017 11:30 | 11/29/2017 12:00 | 0.5 | 0.03 | 0.06 | 0.12 | 20.0 | 11/29/2017 11:25 | 11/29/2017 23:55 | 12.6 | 0.63 | 1.11 | 28,356 |
| 11/30/2017 6:40 | 11/30/2017 10:55 | 4.3 | 0.36 | 0.08 | 0.24 | 39.2 | 11/30/2017 6:40 | 11/30/2017 22:50 | 16.3 | 1.14 | 3.21 | 66,432 |
| 12/1/2017 13:40 | 12/1/2017 18:55 | 5.3 | 0.14 | 0.03 | 0.12 | 27.8 | 12/1/2017 13:40 | 12/2/2017 6:55 | 17.3 | 0.59 | 1.49 | 36,975 |
| 12/2/2017 9:20 | 12/3/2017 0:50 | 15.5 | 0.82 | 0.05 | 0.12 | 14.9 | 12/2/2017 9:20 | 12/3/2017 12:50 | 27.6 | 1.62 | 3.42 | 160,611 |
| 12/15/2017 21:00 | 12/15/2017 21:30 | 0.5 | 0.16 | 0.32 | 0.72 | 308.7 | 12/15/2017 20:55 | 12/16/2017 9:30 | 12.7 | 0.39 | 3.21 | 17,697 |
| 12/16/2017 20:45 | 12/17/2017 0:50 | 4.1 | 0.09 | 0.02 | 0.12 | 23.5 | 12/16/2017 20:45 | 12/17/2017 12:50 | 16.2 | 0.26 | 0.78 | 15,156 |
| 12/18/2017 4:50 | 12/19/2017 12:50 | 32.0 | 1.96 | 0.06 | 0.24 | 30.8 | 12/18/2017 4:50 | 12/19/2017 22:50 | 42.1 | 2.34 | 6.21 | 354,832 |
| 12/19/2017 22:55 | 12/20/2017 4:10 | 5.3 | 0.30 | 0.06 | 0.36 | 10.8 | 12/19/2017 22:50 | 12/20/2017 16:05 | 17.3 | 1.62 | 4.83 | 101,253 |
| 12/22/2017 0:50 | 12/22/2017 9:10 | 8.3 | 0.12 | 0.01 | 0.12 | 46.2 | 12/22/2017 0:45 | 12/22/2017 21:10 | 20.5 | 0.63 | 0.88 | 46,641 |
| 12/25/2017 12:00 | 12/25/2017 17:00 | 5.0 | 0.14 | 0.03 | 0.12 | 78.7 | 12/25/2017 11:55 | 12/26/2017 5:00 | 17.2 | 0.28 | 0.33 | 17,049 |
| 12/26/2017 10:25 | 12/26/2017 12:45 | 2.3 | 0.12 | 0.05 | 0.24 | 19.2 | 12/26/2017 10:25 | 12/27/2017 0:40 | 14.3 | 0.27 | 0.39 | 14,163 |
| 12/27/2017 23:00 | 12/27/2017 23:25 | 0.4 | 0.03 | 0.07 | 0.12 | 34.5 | 12/27/2017 23:00 | 12/28/2017 6:55 | 8.0 | 0.30 | 0.60 | 8,718 |
| 12/28/2017 6:55 | 12/28/2017 7:45 | 0.8 | 0.03 | 0.04 | 0.12 | 42.4 | 12/28/2017 6:55 | 12/28/2017 19:25 | 12.6 | 0.35 | 0.53 | 15,735 |

Table D-13. Summary Statistics for Individual Storm Events at the TYLMO Station.

| Precipitation Start Time | Precipitation Stop Time | Precipitation Duration (hour) | Precipitation Depth (inch) | Precipitation Average Intensity (inch/hour) | Precipitation Maximum Intensity (inch/hour) | Precipitation Antecedent Dry Period (hour) | Flow Start Time | Flow Stop Time | Flow Duration (hour) | Average Flow Rate (feet ³ /second) | Maximum Flow Rate (feet ³ /second) | Flow Volume (feet ³) |
|--------------------------|-------------------------|-------------------------------|----------------------------|---|---|--|------------------|-----------------|----------------------|---|---|----------------------------------|
| 12/28/2017 19:25 | 12/29/2017 17:30 | 22.1 | 1.49 | 0.07 | 0.36 | 54.9 | 12/28/2017 19:25 | 12/30/2017 5:25 | 34.1 | 2.62 | 6.51 | 321,891 |
| 1/4/2018 22:25 | 1/5/2018 17:45 | 19.3 | 0.38 | 0.02 | 0.24 | 151.9 | 1/4/2018 22:25 | 1/5/2018 23:55 | 25.6 | 0.65 | 2.44 | 59,862 |
| 1/5/2018 23:55 | 1/6/2018 14:00 | 14.1 | 0.66 | 0.05 | 0.12 | 8.7 | 1/5/2018 23:55 | 1/7/2018 2:00 | 26.2 | 1.69 | 3.64 | 159,240 |
| 1/7/2018 5:15 | 1/8/2018 2:00 | 20.8 | 0.68 | 0.03 | 0.12 | 17.0 | 1/7/2018 5:15 | 1/8/2018 14:00 | 32.9 | 1.68 | 3.01 | 199,190 |
| 1/8/2018 22:10 | 1/9/2018 23:25 | 25.3 | 1.20 | 0.05 | 0.36 | 23.2 | 1/8/2018 22:05 | 1/10/2018 11:25 | 37.4 | 2.50 | 7.12 | 336,592 |
| 1/10/2018 13:50 | 1/11/2018 13:35 | 23.8 | 1.09 | 0.05 | 0.24 | 16.6 | 1/10/2018 13:50 | 1/11/2018 21:20 | 31.6 | 2.62 | 7.77 | 298,221 |
| 1/11/2018 21:20 | 1/11/2018 23:25 | 2.1 | 0.09 | 0.04 | 0.12 | 8.7 | 1/11/2018 21:20 | 1/12/2018 11:25 | 14.2 | 1.78 | 3.42 | 90,813 |
| 1/12/2018 13:55 | 1/12/2018 23:55 | 10.0 | 0.17 | 0.02 | 0.12 | 15.3 | 1/12/2018 13:50 | 1/13/2018 11:55 | 22.2 | 1.10 | 1.78 | 87,897 |
| 1/15/2018 21:25 | 1/16/2018 7:20 | 9.9 | 0.22 | 0.02 | 0.12 | 71.7 | 1/15/2018 21:20 | 1/16/2018 19:15 | 21.9 | 0.61 | 1.49 | 47,979 |
| 1/17/2018 15:05 | 1/18/2018 5:25 | 14.3 | 1.19 | 0.08 | 0.48 | 33.2 | 1/17/2018 15:00 | 1/18/2018 14:25 | 23.5 | 2.51 | 5.92 | 212,697 |
| 1/18/2018 14:25 | 1/18/2018 21:15 | 6.8 | 0.21 | 0.03 | 0.24 | 9.2 | 1/18/2018 14:25 | 1/19/2018 9:10 | 18.8 | 1.64 | 4.33 | 111,129 |
| 1/19/2018 9:45 | 1/19/2018 14:40 | 4.9 | 0.03 | 0.01 | 0.12 | 16.7 | 1/19/2018 9:40 | 1/20/2018 2:35 | 17.0 | 0.81 | 0.99 | 49,464 |
| 1/20/2018 3:20 | 1/20/2018 6:55 | 3.6 | 0.03 | 0.01 | 0.12 | 34.2 | 1/20/2018 3:20 | 1/20/2018 18:55 | 15.7 | 0.58 | 0.78 | 32,736 |
| 1/21/2018 6:45 | 1/21/2018 9:25 | 2.7 | 0.07 | 0.03 | 0.12 | 61.7 | 1/21/2018 6:40 | 1/21/2018 15:10 | 8.6 | 0.57 | 1.11 | 17,589 |
| 1/21/2018 15:15 | 1/22/2018 5:30 | 14.3 | 0.38 | 0.03 | 0.48 | 7.5 | 1/21/2018 15:10 | 1/22/2018 17:25 | 26.3 | 0.94 | 3.86 | 89,010 |
| 1/23/2018 8:50 | 1/24/2018 2:55 | 18.1 | 0.81 | 0.04 | 0.36 | 27.5 | 1/23/2018 8:45 | 1/24/2018 7:35 | 22.9 | 1.82 | 4.09 | 149,931 |
| 1/24/2018 7:35 | 1/24/2018 22:50 | 15.3 | 0.40 | 0.03 | 0.24 | 6.9 | 1/24/2018 7:30 | 1/25/2018 10:15 | 26.8 | 1.53 | 3.64 | 146,925 |
| 1/25/2018 10:20 | 1/25/2018 18:55 | 8.6 | 0.10 | 0.01 | 0.12 | 15.8 | 1/25/2018 10:15 | 1/26/2018 6:55 | 20.8 | 0.79 | 1.23 | 58,686 |
| 1/26/2018 18:35 | 1/27/2018 10:55 | 16.3 | 0.49 | 0.03 | 0.12 | 29.2 | 1/26/2018 18:30 | 1/27/2018 22:55 | 28.4 | 1.13 | 3.01 | 115,476 |
| 1/27/2018 23:45 | 1/28/2018 2:45 | 3.0 | 0.09 | 0.03 | 0.12 | 13.7 | 1/27/2018 23:45 | 1/28/2018 14:45 | 15.1 | 0.78 | 2.09 | 42,336 |
| 1/29/2018 7:05 | 1/29/2018 16:45 | 9.7 | 0.78 | 0.08 | 0.24 | 30.5 | 1/29/2018 7:05 | 1/30/2018 4:40 | 21.7 | 1.97 | 5.64 | 153,366 |
| 1/30/2018 12:40 | 1/30/2018 13:15 | 0.6 | 0.03 | 0.05 | 0.12 | 20.4 | 1/30/2018 12:40 | 1/31/2018 1:15 | 12.7 | 0.74 | 0.88 | 33,801 |
| 2/1/2018 8:45 | 2/2/2018 16:00 | 31.3 | 0.84 | 0.03 | 0.24 | 64.5 | 2/1/2018 8:45 | 2/3/2018 3:55 | 43.3 | 1.29 | 3.86 | 201,339 |
| 2/3/2018 14:15 | 2/4/2018 12:05 | 21.8 | 0.81 | 0.04 | 0.24 | 27.8 | 2/3/2018 14:10 | 2/5/2018 0:00 | 33.9 | 1.76 | 5.09 | 214,874 |
| 2/5/2018 17:25 | 2/6/2018 7:00 | 13.6 | 0.43 | 0.03 | 0.12 | 33.4 | 2/5/2018 17:25 | 2/6/2018 16:15 | 22.9 | 1.24 | 3.01 | 102,675 |
| 2/6/2018 16:15 | 2/6/2018 20:35 | 4.3 | 0.03 | 0.01 | 0.12 | 13.2 | 2/6/2018 16:15 | 2/7/2018 8:35 | 16.4 | 0.68 | 0.88 | 39,936 |
| 2/8/2018 14:20 | 2/8/2018 18:15 | 3.9 | 0.11 | 0.03 | 0.12 | 59.2 | 2/8/2018 14:15 | 2/9/2018 6:15 | 16.1 | 0.54 | 2.09 | 31,263 |
| 2/9/2018 6:45 | 2/9/2018 9:30 | 2.8 | 0.03 | 0.01 | 0.12 | 13.1 | 2/9/2018 6:45 | 2/9/2018 21:30 | 14.9 | 0.34 | 0.53 | 18,147 |
| 2/13/2018 20:50 | 2/14/2018 11:35 | 14.8 | 0.44 | 0.03 | 0.12 | 123.2 | 2/13/2018 20:45 | 2/14/2018 23:35 | 26.9 | 0.63 | 1.49 | 60,939 |
| 2/16/2018 2:10 | 2/16/2018 7:40 | 5.5 | 0.19 | 0.03 | 0.12 | 39.1 | 2/16/2018 2:10 | 2/16/2018 13:50 | 11.8 | 0.59 | 1.35 | 24,915 |
| 2/16/2018 13:50 | 2/17/2018 10:30 | 20.7 | 0.49 | 0.02 | 0.36 | 7.9 | 2/16/2018 13:50 | 2/17/2018 22:25 | 32.7 | 0.83 | 2.44 | 97,602 |
| 2/22/2018 11:30 | 2/22/2018 13:10 | 1.7 | 0.04 | 0.02 | 0.24 | 122.8 | 2/22/2018 11:25 | 2/23/2018 1:05 | 13.8 | 0.14 | 0.14 | 6,930 |
| 2/24/2018 4:40 | 2/24/2018 8:25 | 3.8 | 0.10 | 0.03 | 0.24 | 41.2 | 2/24/2018 4:40 | 2/24/2018 20:25 | 15.8 | 0.24 | 0.69 | 13,770 |
| 2/25/2018 1:30 | 2/25/2018 3:10 | 1.7 | 0.04 | 0.02 | 0.12 | 17.6 | 2/25/2018 1:30 | 2/25/2018 10:50 | 9.5 | 0.19 | 0.28 | 6,654 |
| 2/25/2018 10:55 | 2/25/2018 13:10 | 2.3 | 0.18 | 0.08 | 0.24 | 9.4 | 2/25/2018 10:50 | 2/26/2018 1:05 | 14.3 | 0.70 | 1.93 | 36,306 |
| 2/26/2018 9:50 | 2/26/2018 16:15 | 6.4 | 0.48 | 0.07 | 0.36 | 21.6 | 2/26/2018 9:45 | 2/27/2018 4:15 | 18.6 | 0.61 | 1.35 | 40,515 |
| 2/27/2018 15:15 | 2/27/2018 22:00 | 6.8 | 0.11 | 0.02 | 0.12 | 23.2 | 2/27/2018 15:10 | 2/28/2018 9:55 | 18.8 | 0.46 | 1.63 | 31,479 |
| 2/28/2018 13:10 | 3/1/2018 2:30 | 13.3 | 0.36 | 0.03 | 0.12 | 15.8 | 2/28/2018 13:05 | 3/1/2018 14:30 | 25.5 | 0.85 | 2.26 | 78,003 |
| 3/2/2018 2:00 | 3/2/2018 6:25 | 4.4 | 0.22 | 0.05 | 0.12 | 26.7 | 3/2/2018 2:00 | 3/2/2018 18:20 | 16.4 | 0.71 | 1.93 | 41,685 |
| 3/4/2018 14:20 | 3/4/2018 16:25 | 2.1 | 0.10 | 0.05 | 0.36 | 57.3 | 3/4/2018 14:15 | 3/5/2018 4:25 | 14.3 | 0.36 | 2.26 | 18,405 |
| 3/5/2018 7:25 | 3/5/2018 8:35 | 1.2 | 0.03 | 0.03 | 0.12 | 15.3 | 3/5/2018 7:25 | 3/5/2018 20:35 | 13.3 | 0.28 | 0.78 | 13,533 |
| 3/7/2018 22:40 | 3/7/2018 23:35 | 0.9 | 0.05 | 0.05 | 0.12 | 78.6 | 3/7/2018 22:40 | 3/8/2018 7:25 | 8.8 | 0.22 | 0.53 | 6,864 |
| 3/8/2018 7:25 | 3/8/2018 19:45 | 12.3 | 0.64 | 0.05 | 0.36 | 8.5 | 3/8/2018 7:25 | 3/9/2018 7:40 | 24.3 | 1.16 | 4.33 | 101,370 |
| 3/13/2018 14:50 | 3/13/2018 19:30 | 4.7 | 0.26 | 0.06 | 0.12 | 116.8 | 3/13/2018 14:45 | 3/14/2018 6:10 | 15.4 | 0.57 | 2.09 | 31,671 |

Table D-13. Summary Statistics for Individual Storm Events at the TYLMO Station.

| Precipitation Start Time | Precipitation Stop Time | Precipitation Duration (hour) | Precipitation Depth (inch) | Precipitation Average Intensity (inch/hour) | Precipitation Maximum Intensity (inch/hour) | Precipitation Antecedent Dry Period (hour) | Flow Start Time | Flow Stop Time | Flow Duration (hour) | Average Flow Rate (feet ³ /second) | Maximum Flow Rate (feet ³ /second) | Flow Volume (feet ³) |
|--------------------------|-------------------------|-------------------------------|----------------------------|---|---|--|-----------------|-----------------|----------------------|---|---|----------------------------------|
| 3/14/2018 6:15 | 3/14/2018 9:35 | 3.3 | 0.04 | 0.01 | 0.12 | 11.8 | 3/14/2018 6:10 | 3/14/2018 21:30 | 15.4 | 0.30 | 0.53 | 16,392 |
| 3/21/2018 21:40 | 3/22/2018 21:55 | 24.3 | 0.50 | 0.02 | 0.24 | 183.4 | 3/21/2018 21:40 | 3/23/2018 6:20 | 32.8 | 0.50 | 1.78 | 58,548 |
| 3/23/2018 6:20 | 3/23/2018 11:00 | 4.7 | 0.38 | 0.08 | 0.24 | 14.3 | 3/23/2018 6:20 | 3/23/2018 23:00 | 16.8 | 0.82 | 3.42 | 49,200 |
| 3/23/2018 23:35 | 3/24/2018 6:30 | 6.9 | 0.26 | 0.04 | 0.24 | 13.6 | 3/23/2018 23:35 | 3/24/2018 18:30 | 19.0 | 0.73 | 2.44 | 49,650 |
| 3/26/2018 4:40 | 3/26/2018 10:30 | 5.8 | 0.03 | 0.01 | 0.12 | 46.8 | 3/26/2018 4:40 | 3/26/2018 11:00 | 6.4 | 0.18 | 0.18 | 4,158 |
| 3/26/2018 11:05 | 3/26/2018 13:35 | 2.5 | 0.04 | 0.02 | 0.12 | 53.2 | 3/26/2018 11:00 | 3/27/2018 1:30 | 14.6 | 0.23 | 0.39 | 12,000 |
| 3/27/2018 10:05 | 3/28/2018 2:15 | 16.2 | 0.16 | 0.01 | 0.12 | 23.0 | 3/27/2018 10:05 | 3/28/2018 14:15 | 28.3 | 0.30 | 0.78 | 30,489 |
| 4/1/2018 7:20 | 4/2/2018 0:25 | 17.1 | 0.30 | 0.02 | 0.24 | 104.8 | 4/1/2018 7:15 | 4/2/2018 12:25 | 29.3 | 0.42 | 2.44 | 44,499 |

Table D-14. Summary Statistics for Individual Storm Events at the TYLMI Station.

| Precipitation Start Time | Precipitation Stop Time | Precipitation Duration (hour) | Precipitation Depth (inch) | Precipitation Average Intensity (inch/hour) | Precipitation Maximum Intensity (inch/hour) | Precipitation Antecedent Dry Period (hour) | Flow Start Time | Flow Stop Time | Flow Duration (hour) | Average Flow Rate (feet ³ /second) | Maximum Flow Rate (feet ³ /second) | Flow Volume (feet ³) |
|--------------------------|-------------------------|-------------------------------|----------------------------|---|---|--|------------------|------------------|----------------------|---|---|----------------------------------|
| 10/7/2017 13:45 | 10/8/2017 3:45 | 14.0 | 0.48 | 0.03 | 0.84 | 12.8 | 10/7/2017 13:40 | 10/8/2017 15:40 | 26.1 | 0.19 | 0.28 | 18,147 |
| 10/10/2017 12:40 | 10/10/2017 19:20 | 6.7 | 0.46 | 0.07 | 0.96 | 68.1 | 10/10/2017 12:40 | 10/11/2017 7:15 | 18.7 | 0.10 | 0.15 | 6,726 |
| 10/12/2017 7:15 | 10/12/2017 15:55 | 8.7 | 0.10 | 0.01 | 0.12 | 36.1 | 10/12/2017 7:15 | 10/12/2017 22:15 | 15.1 | 0.03 | 0.06 | 1,641 |
| 10/12/2017 22:15 | 10/13/2017 7:10 | 8.9 | 0.71 | 0.08 | 0.48 | 10.8 | 10/12/2017 22:15 | 10/13/2017 19:05 | 20.9 | 0.04 | 0.12 | 3,177 |
| 10/17/2017 6:55 | 10/17/2017 11:05 | 4.2 | 0.15 | 0.04 | 0.24 | 95.9 | 10/17/2017 6:55 | 10/17/2017 23:00 | 16.2 | 0.02 | 0.03 | 1,329 |
| 10/18/2017 9:15 | 10/19/2017 21:50 | 36.6 | 1.55 | 0.04 | 0.36 | 22.8 | 10/18/2017 9:10 | 10/20/2017 1:30 | 40.4 | 0.39 | 0.86 | 56,811 |
| 10/20/2017 1:30 | 10/20/2017 11:20 | 9.8 | 0.15 | 0.02 | 0.36 | 6.8 | 10/20/2017 1:30 | 10/20/2017 23:15 | 21.8 | 0.14 | 0.33 | 11,313 |
| 10/21/2017 2:20 | 10/22/2017 0:10 | 21.8 | 0.80 | 0.04 | 0.12 | 24.2 | 10/21/2017 2:15 | 10/22/2017 12:10 | 34.0 | 0.27 | 0.74 | 32,694 |
| 11/1/2017 6:00 | 11/1/2017 9:05 | 3.1 | 0.07 | 0.02 | 0.12 | 248.3 | 11/1/2017 5:55 | 11/1/2017 21:00 | 15.2 | 0.03 | 0.04 | 1,839 |
| 11/2/2017 9:20 | 11/2/2017 11:55 | 2.6 | 0.06 | 0.02 | 0.12 | 26.0 | 11/2/2017 9:20 | 11/2/2017 19:50 | 10.6 | 0.04 | 0.04 | 1,368 |
| 11/2/2017 19:55 | 11/3/2017 14:40 | 18.8 | 0.46 | 0.02 | 0.24 | 8.5 | 11/2/2017 19:50 | 11/4/2017 2:35 | 30.8 | 0.10 | 0.19 | 11,481 |
| 11/4/2017 12:35 | 11/5/2017 14:50 | 26.3 | 1.06 | 0.04 | 0.24 | 22.2 | 11/4/2017 12:30 | 11/6/2017 2:45 | 38.3 | 0.43 | 0.86 | 58,962 |
| 11/8/2017 15:10 | 11/9/2017 0:05 | 8.9 | 0.08 | 0.01 | 0.12 | 73.3 | 11/8/2017 15:10 | 11/9/2017 8:10 | 17.1 | 0.06 | 0.07 | 3,942 |
| 11/9/2017 8:10 | 11/9/2017 22:55 | 14.8 | 0.38 | 0.03 | 0.36 | 15.2 | 11/9/2017 8:10 | 11/10/2017 10:50 | 26.8 | 0.20 | 0.47 | 19,080 |
| 11/11/2017 8:45 | 11/11/2017 20:00 | 11.3 | 0.09 | 0.01 | 0.12 | 36.8 | 11/11/2017 8:45 | 11/12/2017 2:35 | 17.9 | 0.08 | 0.10 | 4,911 |
| 11/12/2017 2:35 | 11/12/2017 8:10 | 5.6 | 0.34 | 0.06 | 0.24 | 11.6 | 11/12/2017 2:35 | 11/12/2017 14:55 | 12.4 | 0.30 | 0.54 | 13,485 |
| 11/12/2017 14:55 | 11/13/2017 6:40 | 15.8 | 0.37 | 0.02 | 0.48 | 7.7 | 11/12/2017 14:55 | 11/13/2017 15:20 | 24.5 | 0.37 | 0.63 | 32,967 |
| 11/13/2017 15:20 | 11/13/2017 18:05 | 2.8 | 0.29 | 0.11 | 0.24 | 12.1 | 11/13/2017 15:20 | 11/14/2017 6:00 | 14.8 | 0.46 | 0.80 | 24,462 |
| 11/14/2017 22:40 | 11/15/2017 10:45 | 12.1 | 0.47 | 0.04 | 0.24 | 29.4 | 11/14/2017 22:40 | 11/15/2017 22:40 | 24.1 | 0.41 | 0.80 | 35,916 |
| 11/16/2017 2:50 | 11/16/2017 9:15 | 6.4 | 0.06 | 0.01 | 0.12 | 18.9 | 11/16/2017 2:50 | 11/16/2017 10:55 | 8.2 | 0.20 | 0.23 | 5,886 |
| 11/16/2017 10:55 | 11/16/2017 12:30 | 1.6 | 0.06 | 0.04 | 0.12 | 7.3 | 11/16/2017 10:55 | 11/17/2017 0:30 | 13.7 | 0.19 | 0.23 | 9,432 |
| 11/19/2017 15:45 | 11/20/2017 16:35 | 24.8 | 0.87 | 0.04 | 1.08 | 76.4 | 11/19/2017 15:40 | 11/21/2017 4:30 | 36.9 | 0.49 | 1.34 | 65,601 |
| 11/21/2017 5:00 | 11/22/2017 6:25 | 25.4 | 1.70 | 0.07 | 0.36 | 13.2 | 11/21/2017 5:00 | 11/22/2017 10:40 | 29.8 | 1.39 | 2.97 | 149,154 |
| 11/22/2017 10:40 | 11/22/2017 15:40 | 5.0 | 0.06 | 0.01 | 0.24 | 8.7 | 11/22/2017 10:40 | 11/22/2017 21:10 | 10.6 | 0.67 | 0.99 | 25,599 |
| 11/22/2017 21:15 | 11/23/2017 0:45 | 3.5 | 0.42 | 0.12 | 0.48 | 10.5 | 11/22/2017 21:10 | 11/23/2017 8:20 | 11.3 | 0.85 | 1.19 | 34,362 |
| 11/23/2017 8:20 | 11/23/2017 13:50 | 5.5 | 0.40 | 0.07 | 0.36 | 8.2 | 11/23/2017 8:20 | 11/24/2017 1:50 | 17.6 | 0.82 | 1.27 | 52,134 |
| 11/24/2017 15:25 | 11/24/2017 18:35 | 3.2 | 0.06 | 0.02 | 0.12 | 26.8 | 11/24/2017 15:20 | 11/25/2017 6:30 | 15.3 | 0.16 | 0.19 | 8,847 |
| 11/25/2017 16:10 | 11/26/2017 2:10 | 10.0 | 0.16 | 0.02 | 0.12 | 23.2 | 11/25/2017 16:05 | 11/26/2017 2:55 | 10.9 | 0.14 | 0.19 | 5,439 |
| 11/26/2017 2:55 | 11/26/2017 19:10 | 16.3 | 0.64 | 0.04 | 0.36 | 6.6 | 11/26/2017 2:55 | 11/27/2017 7:05 | 28.3 | 0.52 | 1.12 | 52,575 |
| 11/28/2017 5:55 | 11/28/2017 16:05 | 10.2 | 0.76 | 0.07 | 0.24 | 38.9 | 11/28/2017 5:55 | 11/29/2017 4:05 | 22.3 | 0.68 | 1.42 | 54,837 |
| 11/29/2017 11:30 | 11/29/2017 12:00 | 0.5 | 0.03 | 0.06 | 0.12 | 20.0 | 11/29/2017 11:25 | 11/29/2017 23:55 | 12.6 | 0.23 | 0.28 | 10,332 |
| 11/30/2017 6:40 | 11/30/2017 10:55 | 4.3 | 0.36 | 0.08 | 0.24 | 39.2 | 11/30/2017 6:40 | 11/30/2017 22:50 | 16.3 | 0.42 | 0.68 | 24,774 |
| 12/1/2017 13:40 | 12/1/2017 18:55 | 5.3 | 0.14 | 0.03 | 0.12 | 27.8 | 12/1/2017 13:40 | 12/2/2017 6:55 | 17.3 | 0.18 | 0.23 | 11,232 |
| 12/2/2017 9:20 | 12/3/2017 0:50 | 15.5 | 0.82 | 0.05 | 0.12 | 14.9 | 12/2/2017 9:20 | 12/3/2017 12:45 | 27.5 | 0.69 | 1.12 | 68,367 |
| 12/15/2017 21:00 | 12/15/2017 21:30 | 0.5 | 0.16 | 0.32 | 0.72 | 308.7 | 12/15/2017 20:55 | 12/16/2017 9:30 | 12.7 | 0.09 | 0.12 | 4,032 |
| 12/16/2017 20:45 | 12/17/2017 0:50 | 4.1 | 0.09 | 0.02 | 0.12 | 23.5 | 12/16/2017 20:45 | 12/17/2017 12:45 | 16.1 | 0.08 | 0.10 | 4,548 |
| 12/18/2017 4:50 | 12/19/2017 12:50 | 32.0 | 1.96 | 0.06 | 0.24 | 30.8 | 12/18/2017 4:50 | 12/19/2017 22:50 | 42.1 | 0.97 | 2.33 | 147,324 |
| 12/19/2017 22:55 | 12/20/2017 4:10 | 5.3 | 0.30 | 0.06 | 0.36 | 10.8 | 12/19/2017 22:50 | 12/20/2017 16:05 | 17.3 | 0.92 | 1.19 | 57,363 |
| 12/22/2017 0:50 | 12/22/2017 9:10 | 8.3 | 0.12 | 0.01 | 0.12 | 46.2 | 12/22/2017 0:45 | 12/22/2017 21:10 | 20.5 | 0.22 | 0.28 | 16,125 |
| 12/25/2017 12:00 | 12/25/2017 17:00 | 5.0 | 0.14 | 0.03 | 0.12 | 78.7 | 12/25/2017 11:55 | 12/26/2017 5:00 | 17.2 | 0.06 | 0.06 | 3,708 |
| 12/26/2017 10:25 | 12/26/2017 12:45 | 2.3 | 0.12 | 0.05 | 0.24 | 19.2 | 12/26/2017 10:25 | 12/27/2017 0:40 | 14.3 | 0.06 | 0.06 | 3,096 |
| 12/27/2017 23:00 | 12/27/2017 23:25 | 0.4 | 0.03 | 0.07 | 0.12 | 34.5 | 12/27/2017 23:00 | 12/28/2017 6:55 | 8.0 | 0.06 | 0.06 | 1,728 |
| 12/28/2017 6:55 | 12/28/2017 7:45 | 0.8 | 0.03 | 0.04 | 0.12 | 42.4 | 12/28/2017 6:55 | 12/28/2017 19:25 | 12.6 | 0.10 | 0.12 | 4,611 |

Table D-14. Summary Statistics for Individual Storm Events at the TYLMI Station.

| Precipitation Start Time | Precipitation Stop Time | Precipitation Duration (hour) | Precipitation Depth (inch) | Precipitation Average Intensity (inch/hour) | Precipitation Maximum Intensity (inch/hour) | Precipitation Antecedent Dry Period (hour) | Flow Start Time | Flow Stop Time | Flow Duration (hour) | Average Flow Rate (feet ³ /second) | Maximum Flow Rate (feet ³ /second) | Flow Volume (feet ³) |
|--------------------------|-------------------------|-------------------------------|----------------------------|---|---|--|------------------|-----------------|----------------------|---|---|----------------------------------|
| 12/28/2017 19:25 | 12/29/2017 17:30 | 22.1 | 1.49 | 0.07 | 0.36 | 54.9 | 12/28/2017 19:25 | 12/30/2017 5:25 | 34.1 | 1.12 | 2.43 | 137,190 |
| 1/4/2018 22:25 | 1/5/2018 17:45 | 19.3 | 0.38 | 0.02 | 0.24 | 151.9 | 1/4/2018 22:25 | 1/5/2018 23:55 | 25.6 | 0.20 | 0.33 | 18,096 |
| 1/5/2018 23:55 | 1/6/2018 14:00 | 14.1 | 0.66 | 0.05 | 0.12 | 8.7 | 1/5/2018 23:55 | 1/7/2018 2:00 | 26.2 | 0.75 | 1.05 | 71,100 |
| 1/7/2018 5:15 | 1/8/2018 2:00 | 20.8 | 0.68 | 0.03 | 0.12 | 17.0 | 1/7/2018 5:15 | 1/8/2018 14:00 | 32.8 | 0.73 | 1.12 | 86,205 |
| 1/8/2018 22:10 | 1/9/2018 23:25 | 25.3 | 1.20 | 0.05 | 0.36 | 23.2 | 1/8/2018 22:05 | 1/10/2018 11:25 | 37.4 | 0.99 | 2.03 | 133,566 |
| 1/10/2018 13:50 | 1/11/2018 13:35 | 23.8 | 1.09 | 0.05 | 0.24 | 16.6 | 1/10/2018 13:50 | 1/11/2018 21:20 | 31.6 | 1.05 | 2.43 | 119,613 |
| 1/11/2018 21:20 | 1/11/2018 23:25 | 2.1 | 0.09 | 0.04 | 0.12 | 8.7 | 1/11/2018 21:20 | 1/12/2018 11:25 | 14.2 | 1.06 | 1.19 | 53,877 |
| 1/12/2018 13:55 | 1/12/2018 23:55 | 10.0 | 0.17 | 0.02 | 0.12 | 15.3 | 1/12/2018 13:50 | 1/13/2018 11:55 | 22.2 | 0.56 | 0.74 | 44,724 |
| 1/15/2018 21:25 | 1/16/2018 7:20 | 9.9 | 0.22 | 0.02 | 0.12 | 71.7 | 1/15/2018 21:20 | 1/16/2018 19:15 | 22.0 | 0.19 | 0.28 | 14,733 |
| 1/17/2018 15:05 | 1/18/2018 5:25 | 14.3 | 1.19 | 0.08 | 0.48 | 33.2 | 1/17/2018 15:00 | 1/18/2018 14:25 | 23.5 | 1.14 | 1.94 | 96,132 |
| 1/18/2018 14:25 | 1/18/2018 21:15 | 6.8 | 0.21 | 0.03 | 0.24 | 9.2 | 1/18/2018 14:25 | 1/19/2018 9:10 | 18.8 | 1.04 | 1.27 | 70,293 |
| 1/19/2018 9:45 | 1/19/2018 14:40 | 4.9 | 0.03 | 0.01 | 0.12 | 16.7 | 1/19/2018 9:40 | 1/20/2018 2:40 | 17.1 | 0.42 | 0.68 | 25,545 |
| 1/20/2018 3:20 | 1/20/2018 6:55 | 3.6 | 0.03 | 0.01 | 0.12 | 34.2 | 1/20/2018 3:20 | 1/20/2018 18:55 | 15.7 | 0.20 | 0.23 | 11,400 |
| 1/21/2018 6:45 | 1/21/2018 9:25 | 2.7 | 0.07 | 0.03 | 0.12 | 61.7 | 1/21/2018 6:40 | 1/21/2018 15:10 | 8.6 | 0.15 | 0.19 | 4,485 |
| 1/21/2018 15:15 | 1/22/2018 5:30 | 14.3 | 0.38 | 0.03 | 0.48 | 7.5 | 1/21/2018 15:10 | 1/22/2018 17:30 | 26.4 | 0.44 | 0.63 | 41,397 |
| 1/23/2018 8:50 | 1/24/2018 2:55 | 18.1 | 0.81 | 0.04 | 0.36 | 27.5 | 1/23/2018 8:45 | 1/24/2018 7:30 | 22.8 | 0.88 | 1.27 | 72,288 |
| 1/24/2018 7:35 | 1/24/2018 22:50 | 15.3 | 0.40 | 0.03 | 0.24 | 6.9 | 1/24/2018 7:30 | 1/25/2018 10:15 | 26.8 | 0.91 | 1.12 | 88,134 |
| 1/25/2018 10:20 | 1/25/2018 18:55 | 8.6 | 0.10 | 0.01 | 0.12 | 15.8 | 1/25/2018 10:15 | 1/26/2018 6:55 | 20.8 | 0.43 | 0.63 | 32,079 |
| 1/26/2018 18:35 | 1/27/2018 10:55 | 16.3 | 0.49 | 0.03 | 0.12 | 29.2 | 1/26/2018 18:30 | 1/27/2018 22:50 | 28.4 | 0.63 | 0.99 | 64,752 |
| 1/27/2018 23:45 | 1/28/2018 2:45 | 3.0 | 0.09 | 0.03 | 0.12 | 13.7 | 1/27/2018 23:45 | 1/28/2018 14:45 | 15.1 | 0.42 | 0.54 | 22,947 |
| 1/29/2018 7:05 | 1/29/2018 16:45 | 9.7 | 0.78 | 0.08 | 0.24 | 30.5 | 1/29/2018 7:05 | 1/30/2018 4:40 | 21.7 | 0.98 | 1.94 | 76,713 |
| 1/30/2018 12:40 | 1/30/2018 13:15 | 0.6 | 0.03 | 0.05 | 0.12 | 20.4 | 1/30/2018 12:40 | 1/31/2018 1:15 | 12.7 | 0.39 | 0.63 | 17,601 |
| 2/1/2018 8:45 | 2/2/2018 16:00 | 31.3 | 0.84 | 0.03 | 0.24 | 64.5 | 2/1/2018 8:45 | 2/3/2018 3:55 | 43.3 | 0.66 | 1.27 | 102,426 |
| 2/3/2018 14:15 | 2/4/2018 12:05 | 21.8 | 0.81 | 0.04 | 0.24 | 27.8 | 2/3/2018 14:10 | 2/5/2018 0:00 | 33.9 | 0.95 | 1.85 | 116,499 |
| 2/5/2018 17:25 | 2/6/2018 7:00 | 13.6 | 0.43 | 0.03 | 0.12 | 33.4 | 2/5/2018 17:25 | 2/6/2018 16:15 | 22.9 | 0.67 | 0.92 | 55,632 |
| 2/6/2018 16:15 | 2/6/2018 20:35 | 4.3 | 0.03 | 0.01 | 0.12 | 13.2 | 2/6/2018 16:15 | 2/7/2018 8:35 | 16.4 | 0.31 | 0.47 | 18,531 |
| 2/8/2018 14:20 | 2/8/2018 18:15 | 3.9 | 0.11 | 0.03 | 0.12 | 59.2 | 2/8/2018 14:15 | 2/9/2018 6:10 | 16.0 | 0.18 | 0.28 | 10,206 |
| 2/9/2018 6:45 | 2/9/2018 9:30 | 2.8 | 0.03 | 0.01 | 0.12 | 13.1 | 2/9/2018 6:45 | 2/9/2018 21:30 | 14.8 | 0.10 | 0.15 | 5,556 |
| 2/13/2018 20:50 | 2/14/2018 11:35 | 14.8 | 0.44 | 0.03 | 0.12 | 123.2 | 2/13/2018 20:45 | 2/14/2018 23:35 | 26.9 | 0.17 | 0.28 | 16,119 |
| 2/16/2018 2:10 | 2/16/2018 7:40 | 5.5 | 0.19 | 0.03 | 0.12 | 39.1 | 2/16/2018 2:10 | 2/16/2018 13:50 | 11.8 | 0.14 | 0.19 | 6,057 |
| 2/16/2018 13:50 | 2/17/2018 10:30 | 20.7 | 0.49 | 0.02 | 0.36 | 7.9 | 2/16/2018 13:50 | 2/17/2018 22:25 | 32.7 | 0.33 | 0.54 | 39,033 |
| 2/22/2018 11:30 | 2/22/2018 13:10 | 1.7 | 0.04 | 0.02 | 0.24 | 122.8 | 2/22/2018 11:25 | 2/23/2018 1:05 | 13.8 | 0.03 | 0.03 | 1,485 |
| 2/24/2018 4:40 | 2/24/2018 8:25 | 3.8 | 0.10 | 0.03 | 0.24 | 41.2 | 2/24/2018 4:40 | 2/24/2018 20:25 | 15.8 | 0.05 | 0.06 | 2,715 |
| 2/25/2018 1:30 | 2/25/2018 3:10 | 1.7 | 0.04 | 0.02 | 0.12 | 17.6 | 2/25/2018 1:30 | 2/25/2018 10:50 | 9.4 | 0.04 | 0.04 | 1,356 |
| 2/25/2018 10:55 | 2/25/2018 13:10 | 2.3 | 0.18 | 0.08 | 0.24 | 9.4 | 2/25/2018 10:50 | 2/26/2018 1:05 | 14.3 | 0.18 | 0.23 | 9,411 |
| 2/26/2018 9:50 | 2/26/2018 16:15 | 6.4 | 0.48 | 0.07 | 0.36 | 21.6 | 2/26/2018 9:45 | 2/27/2018 4:15 | 18.6 | 0.21 | 0.28 | 14,097 |
| 2/27/2018 15:15 | 2/27/2018 22:00 | 6.8 | 0.11 | 0.02 | 0.12 | 23.2 | 2/27/2018 15:10 | 2/28/2018 9:55 | 18.8 | 0.17 | 0.23 | 11,232 |
| 2/28/2018 13:10 | 3/1/2018 2:30 | 13.3 | 0.36 | 0.03 | 0.12 | 15.8 | 2/28/2018 13:05 | 3/1/2018 14:25 | 25.4 | 0.39 | 0.68 | 36,087 |
| 3/2/2018 2:00 | 3/2/2018 6:25 | 4.4 | 0.22 | 0.05 | 0.12 | 26.7 | 3/2/2018 2:00 | 3/2/2018 18:20 | 16.4 | 0.29 | 0.40 | 17,148 |
| 3/4/2018 14:20 | 3/4/2018 16:25 | 2.1 | 0.10 | 0.05 | 0.36 | 57.3 | 3/4/2018 14:15 | 3/5/2018 4:25 | 14.3 | 0.10 | 0.12 | 4,893 |
| 3/5/2018 7:25 | 3/5/2018 8:35 | 1.2 | 0.03 | 0.03 | 0.12 | 15.3 | 3/5/2018 7:25 | 3/5/2018 20:35 | 13.3 | 0.07 | 0.07 | 3,339 |
| 3/7/2018 22:40 | 3/7/2018 23:35 | 0.9 | 0.05 | 0.05 | 0.12 | 78.6 | 3/7/2018 22:40 | 3/8/2018 7:25 | 8.8 | 0.05 | 0.06 | 1,722 |
| 3/8/2018 7:25 | 3/8/2018 19:45 | 12.3 | 0.64 | 0.05 | 0.36 | 8.5 | 3/8/2018 7:25 | 3/9/2018 7:40 | 24.3 | 0.57 | 0.99 | 50,163 |
| 3/13/2018 14:50 | 3/13/2018 19:30 | 4.7 | 0.26 | 0.06 | 0.12 | 116.8 | 3/13/2018 14:45 | 3/14/2018 6:10 | 15.5 | 0.21 | 0.33 | 11,985 |

Table D-14. Summary Statistics for Individual Storm Events at the TYLMI Station.

| Precipitation Start Time | Precipitation Stop Time | Precipitation Duration (hour) | Precipitation Depth (inch) | Precipitation Average Intensity (inch/hour) | Precipitation Maximum Intensity (inch/hour) | Precipitation Antecedent Dry Period (hour) | Flow Start Time | Flow Stop Time | Flow Duration (hour) | Average Flow Rate (feet ³ /second) | Maximum Flow Rate (feet ³ /second) | Flow Volume (feet ³) |
|--------------------------|-------------------------|-------------------------------|----------------------------|---|---|--|-----------------|-----------------|----------------------|---|---|----------------------------------|
| 3/14/2018 6:15 | 3/14/2018 9:35 | 3.3 | 0.04 | 0.01 | 0.12 | 11.8 | 3/14/2018 6:10 | 3/14/2018 21:30 | 15.4 | 0.12 | 0.15 | 6,795 |
| 3/21/2018 21:40 | 3/22/2018 21:55 | 24.3 | 0.50 | 0.02 | 0.24 | 183.4 | 3/21/2018 21:40 | 3/23/2018 6:20 | 32.8 | 0.15 | 0.40 | 18,159 |
| 3/23/2018 6:20 | 3/23/2018 11:00 | 4.7 | 0.38 | 0.08 | 0.24 | 14.3 | 3/23/2018 6:20 | 3/23/2018 23:00 | 16.8 | 0.40 | 0.63 | 23,952 |
| 3/23/2018 23:35 | 3/24/2018 6:30 | 6.9 | 0.26 | 0.04 | 0.24 | 13.6 | 3/23/2018 23:35 | 3/24/2018 18:30 | 19.0 | 0.38 | 0.63 | 26,202 |
| 3/26/2018 4:40 | 3/26/2018 10:30 | 5.8 | 0.03 | 0.01 | 0.12 | 46.8 | 3/26/2018 4:40 | 3/26/2018 11:00 | 6.4 | 0.06 | 0.06 | 1,386 |
| 3/26/2018 11:05 | 3/26/2018 13:35 | 2.5 | 0.04 | 0.02 | 0.12 | 53.2 | 3/26/2018 11:00 | 3/27/2018 1:30 | 14.6 | 0.06 | 0.07 | 3,357 |
| 3/27/2018 10:05 | 3/28/2018 2:15 | 16.2 | 0.16 | 0.01 | 0.12 | 23.0 | 3/27/2018 10:05 | 3/28/2018 14:10 | 28.2 | 0.09 | 0.12 | 8,919 |
| 4/1/2018 7:20 | 4/2/2018 0:25 | 17.1 | 0.30 | 0.02 | 0.24 | 104.8 | 4/1/2018 7:15 | 4/2/2018 12:20 | 29.2 | 0.16 | 0.40 | 17,172 |

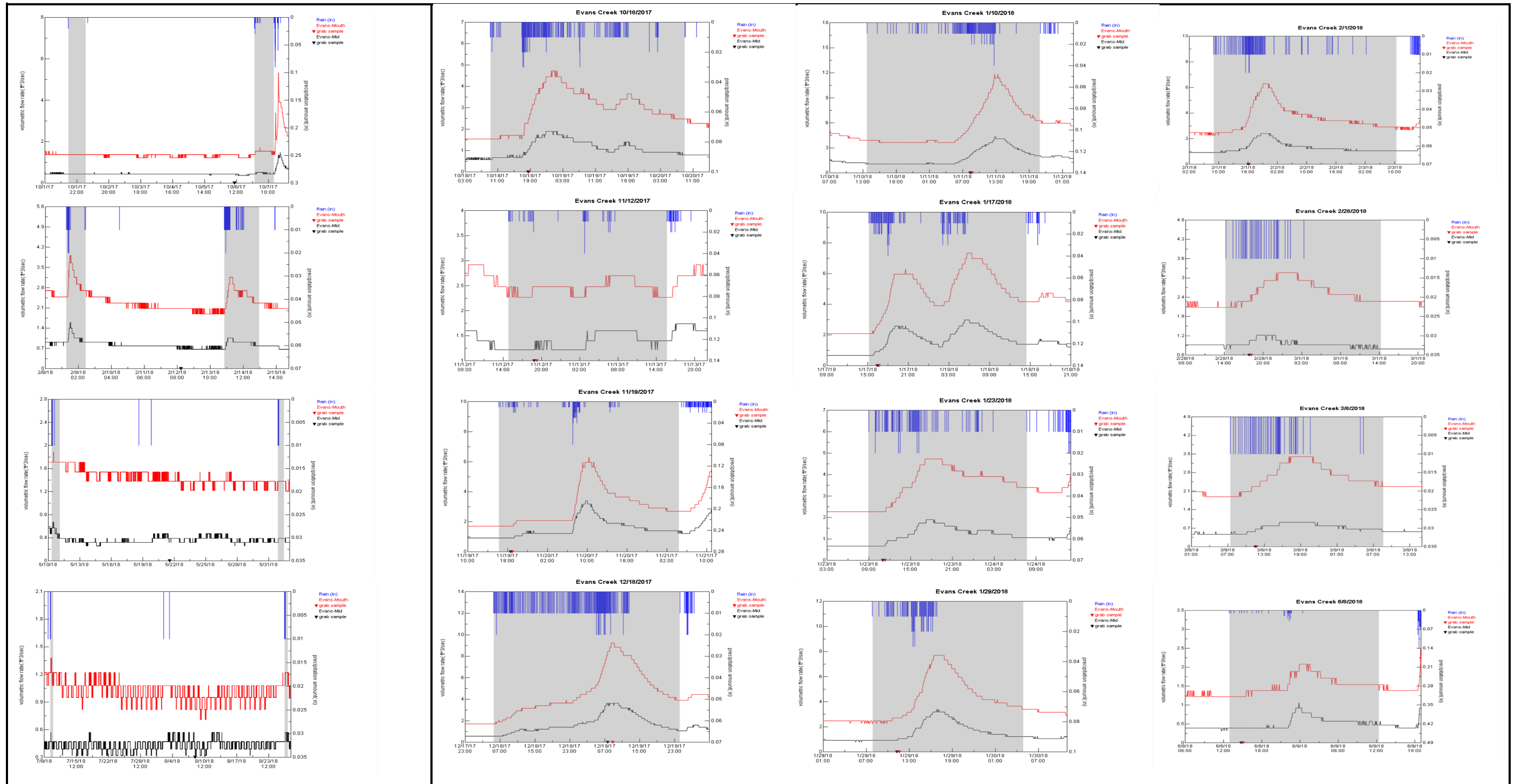
APPENDIX E

Line Plots Showing Sampling Times Relative to the Storm Event Hydrograph

Evans – Application Watershed – Sampled Hydrographs

Base Flow

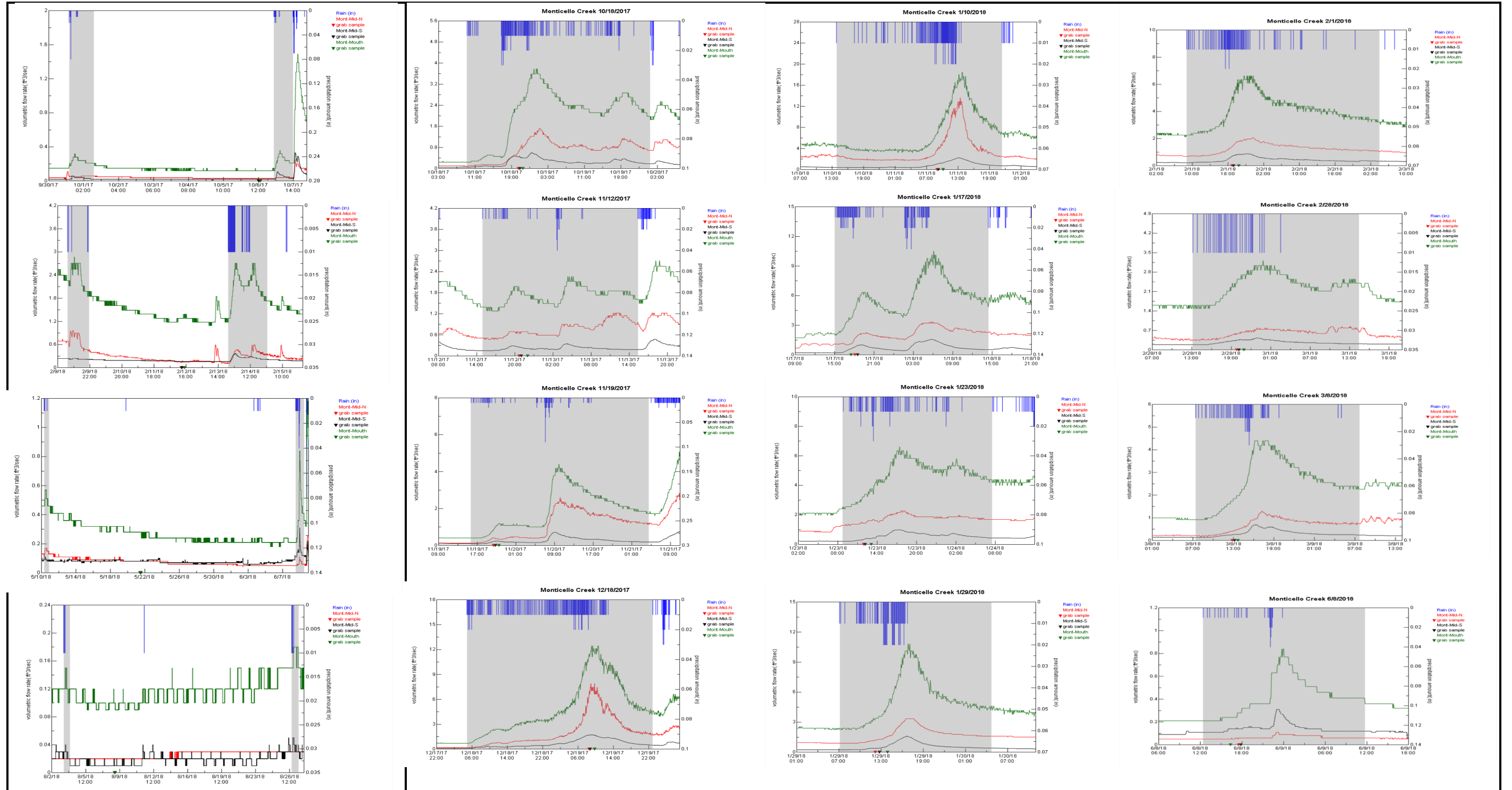
Storm Flow



Monticello – Application Watershed – Sampled Hydrographs

Base Flow

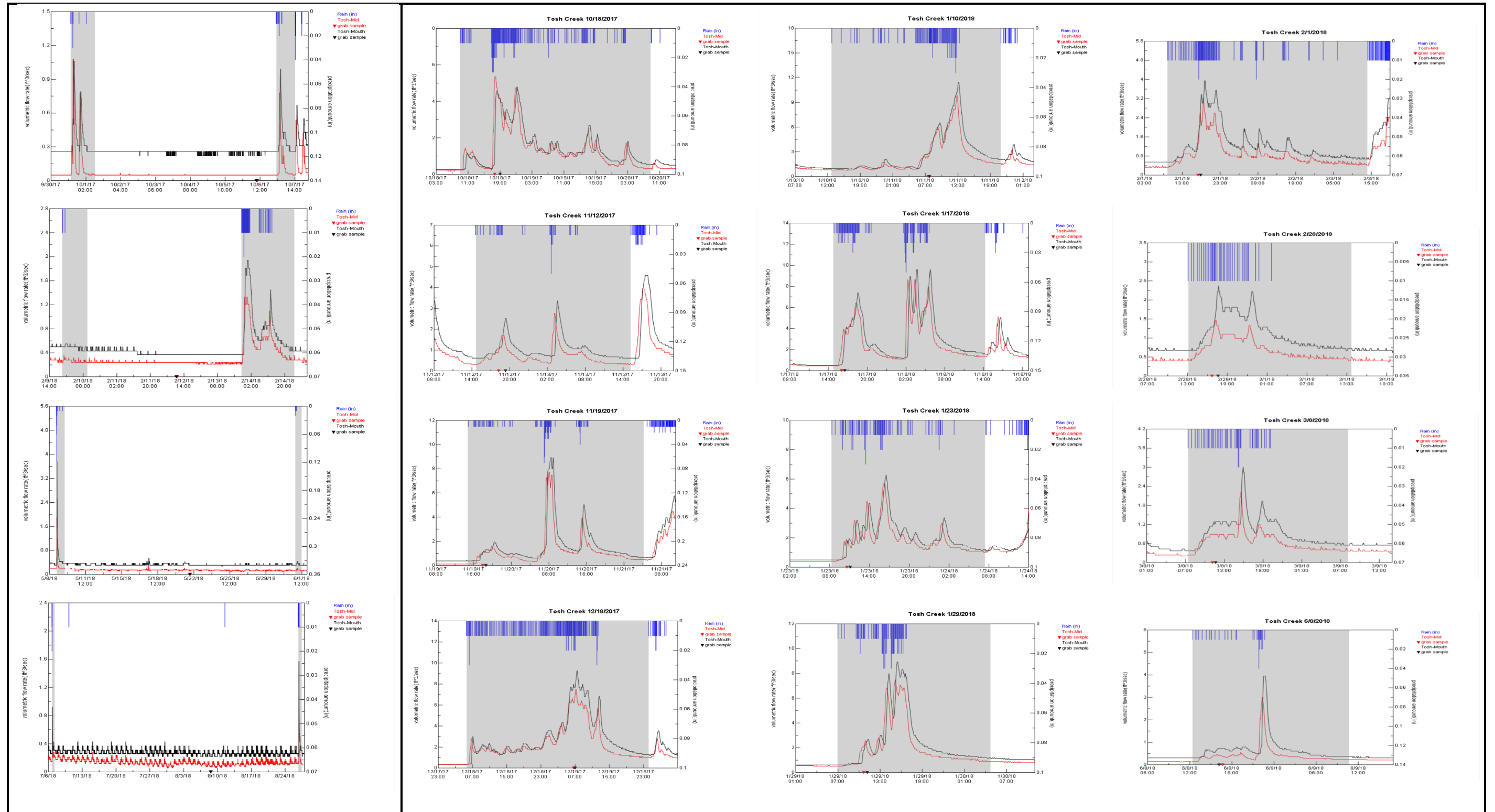
Storm Flow



Tosh – Application Watershed – Sampled Hydrographs

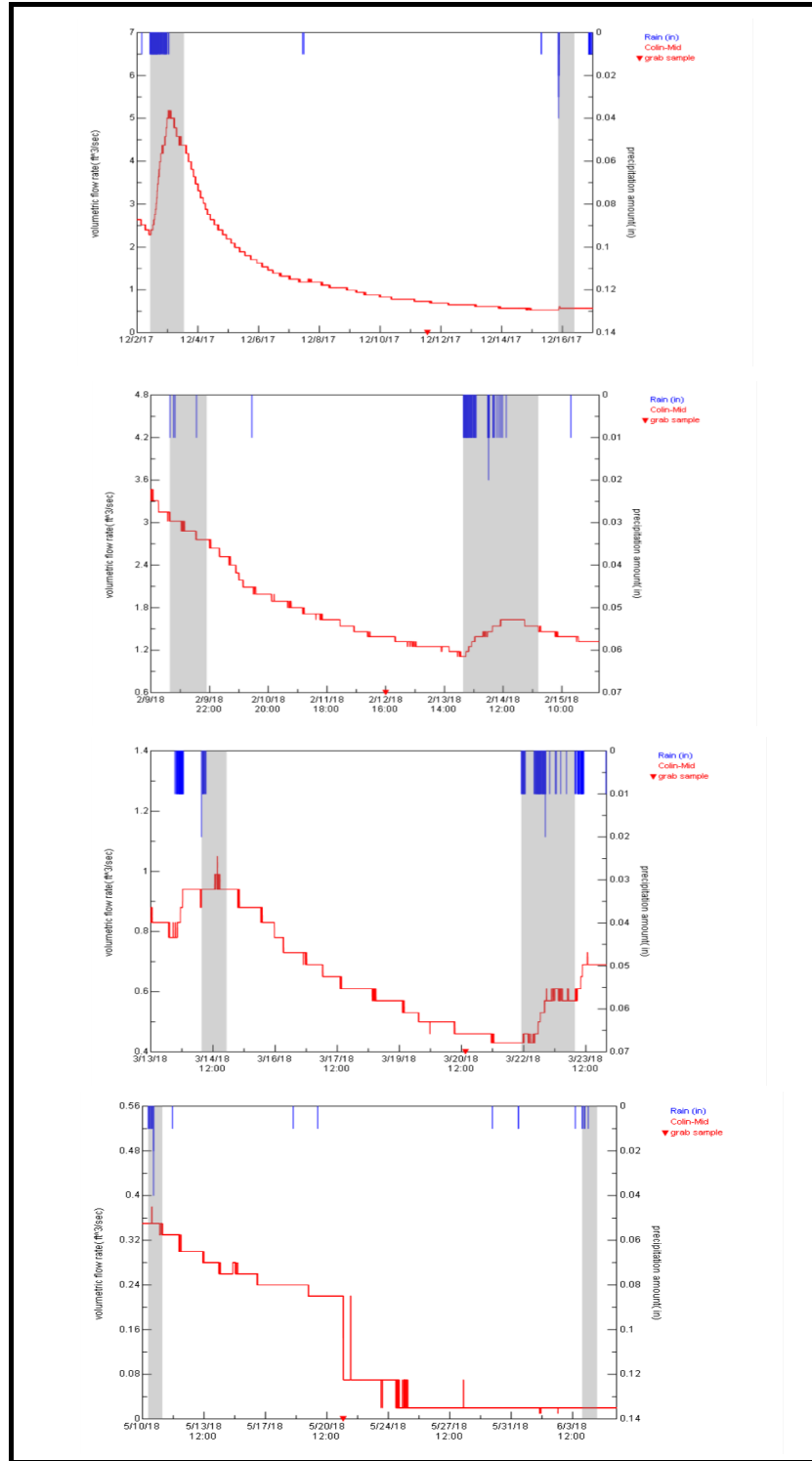
Base Flow

Storm Flow

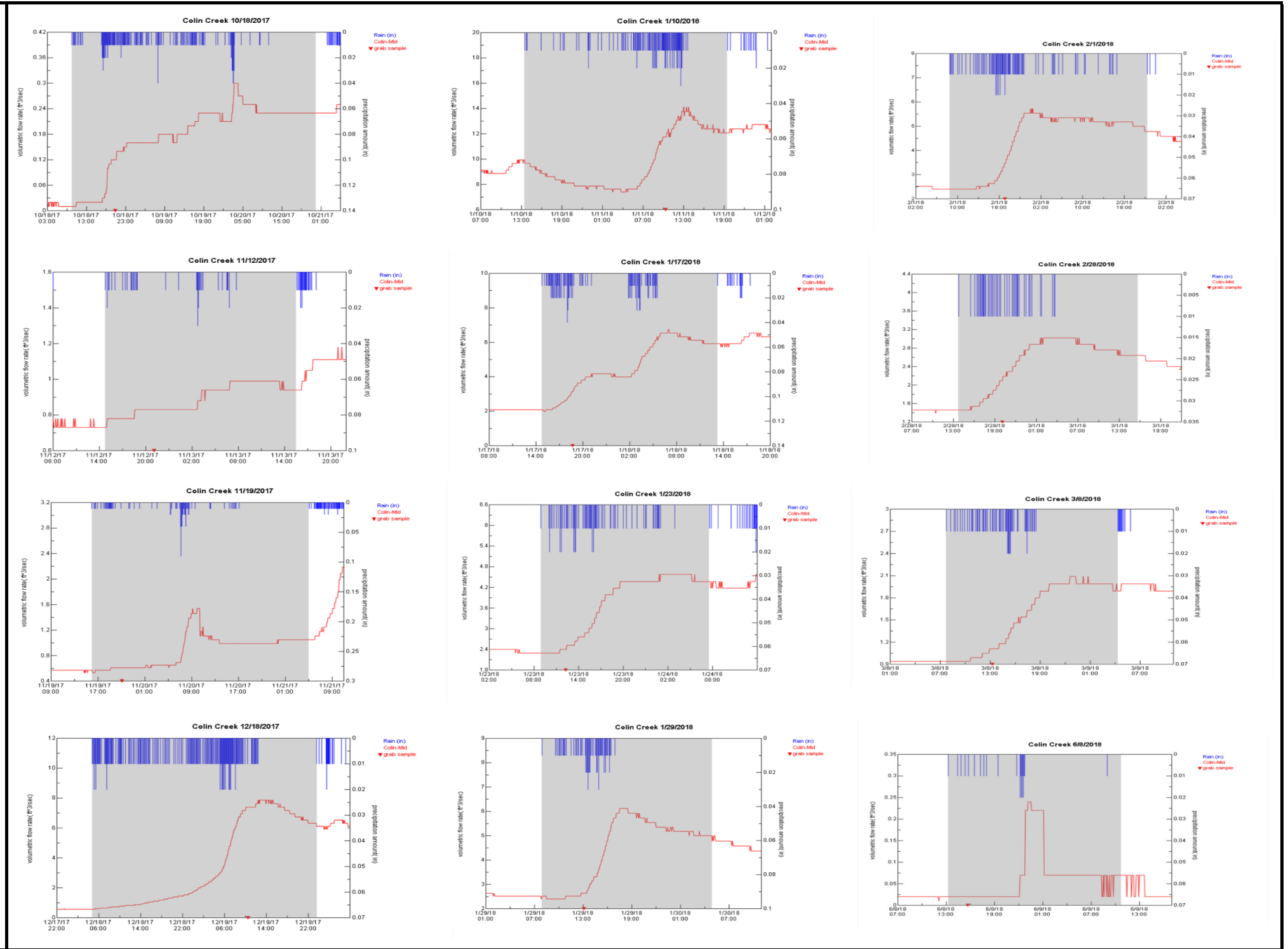


Colin – Reference Watershed – Sampled Hydrographs

Base Flow



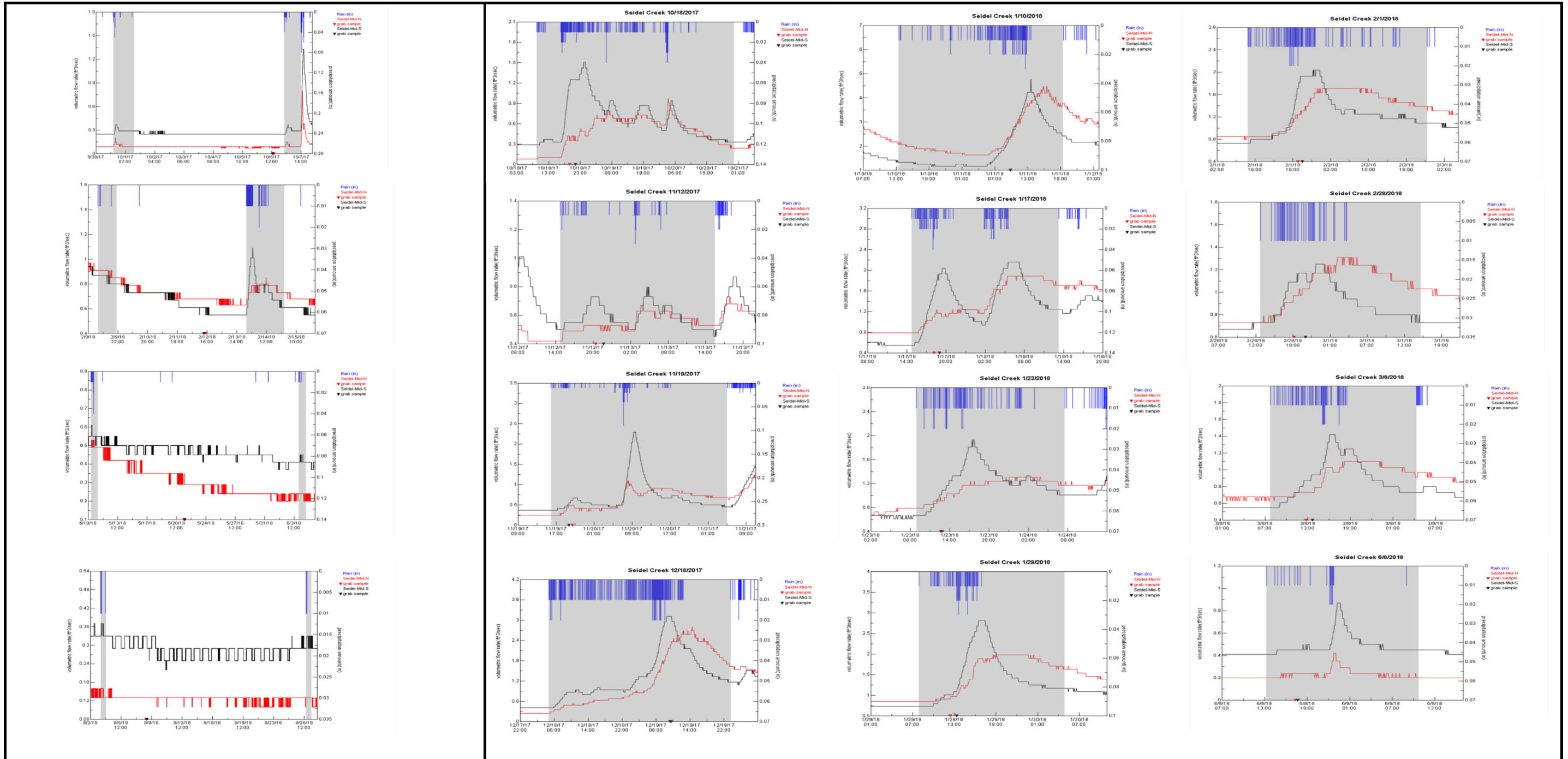
Storm Flow



Seidel – Reference Watershed – Sampled Hydrographs

Base Flow

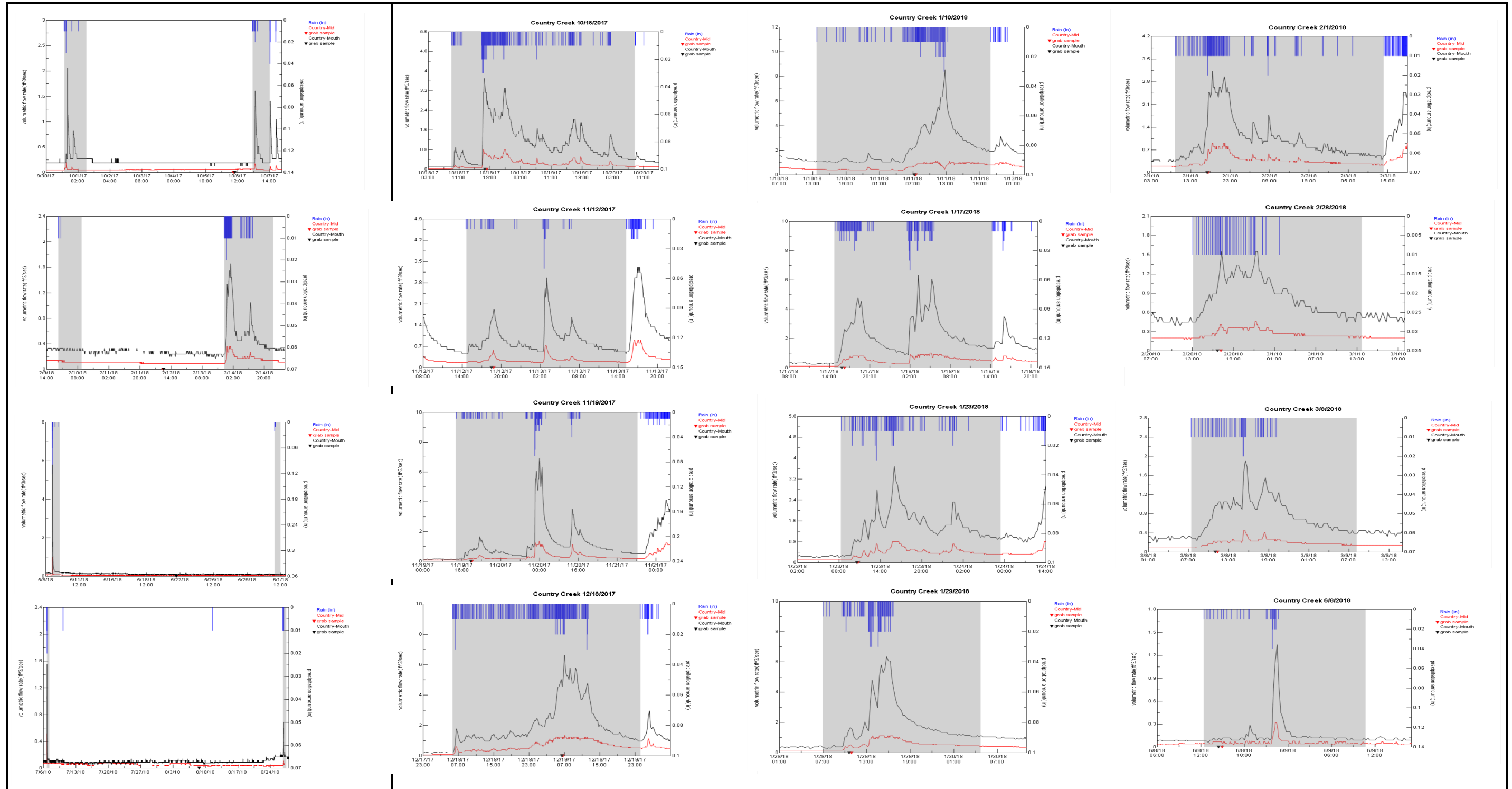
Storm Flow



Country – Control Watershed – Sampled Hydrographs

Base Flow

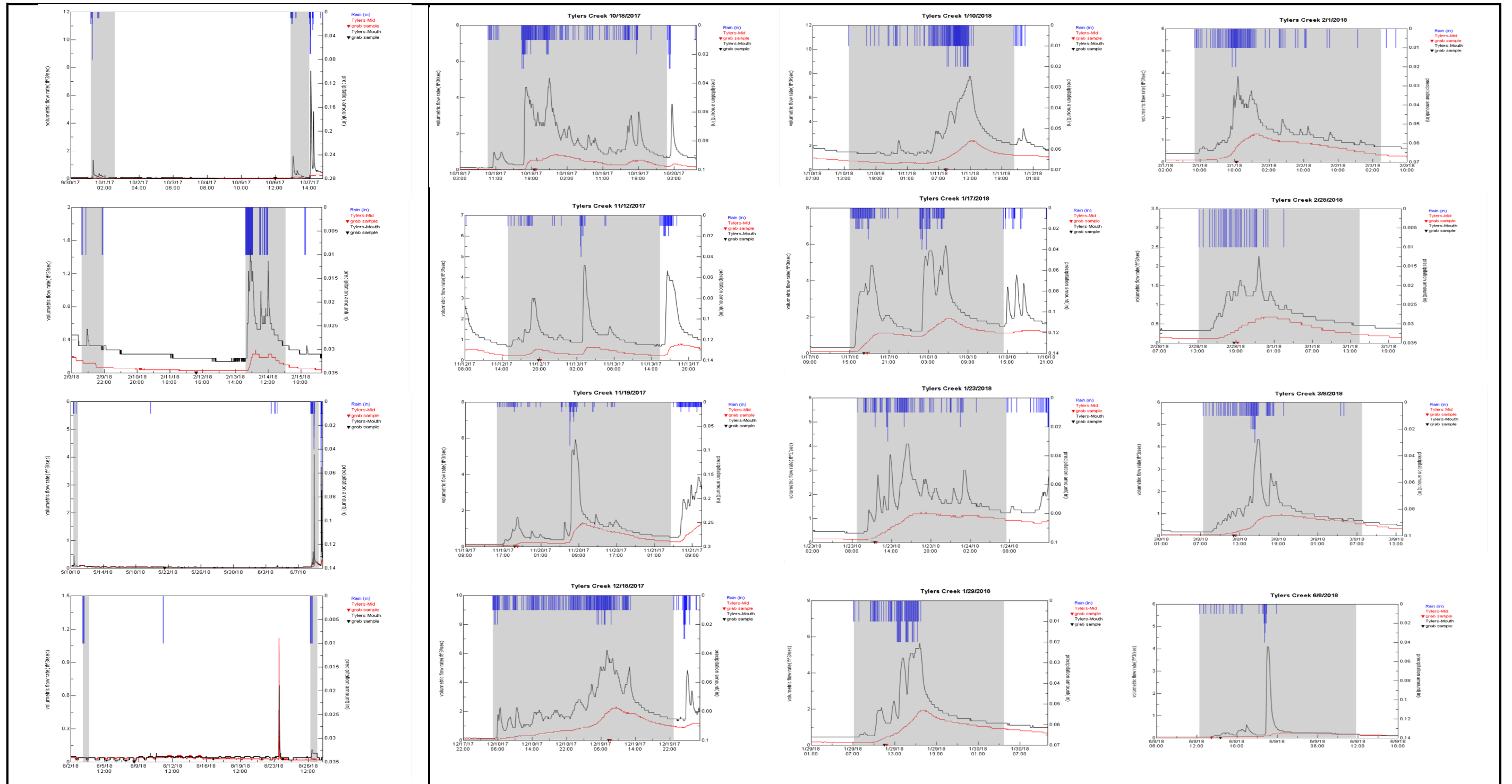
Storm Flow



Tyler's – Control Watershed – Sampled Hydrographs

Base Flow

Storm Flow



APPENDIX F

Laboratory Reports, Field Forms, and Data Quality Assurance Audit Forms for Water Quality Monitoring



14648 NE 95th Street, Redmond, WA 98052 • (425) 883-3881

October 24, 2017

George Iftner
Herrera Environmental Consultants, Inc.
2200 6th Avenue, Suite 1100
Seattle, WA 98121

Re: Analytical Data for Project 14-05806-000
Laboratory Reference No. 1710-089

Dear George:

Enclosed are the analytical results and associated quality control data for samples submitted on October 6, 2017.

The standard policy of OnSite Environmental, Inc. is to store your samples for 30 days from the date of receipt. If you require longer storage, please contact the laboratory.

We appreciate the opportunity to be of service to you on this project. If you have any questions concerning the data, or need additional information, please feel free to call me.

Sincerely,

A handwritten signature in black ink, appearing to read "Blair Goodrow", enclosed within a large, loopy, circular scribble.

Blair Goodrow
Project Manager

Enclosures



OnSite Environmental, Inc. 14648 NE 95th Street, Redmond, WA 98052 (425) 883-3881

This report pertains to the samples analyzed in accordance with the chain of custody, and is intended only for the use of the individual or company to whom it is addressed.

Date of Report: October 24, 2017
Samples Submitted: October 6, 2017
Laboratory Reference: 1710-089
Project: 14-05806-000

Case Narrative

Samples were collected on October 6, 2017 and received by the laboratory on October 6, 2017. They were maintained at the laboratory at a temperature of 2°C to 6°C.

Please note that any and all soil sample results are reported on a dry-weight basis, unless otherwise noted below.

General QA/QC issues associated with the analytical data enclosed in this laboratory report will be indicated with a reference to a comment or explanation on the Data Qualifier page. More complex and involved QA/QC issues will be discussed in detail below.



Date of Report: October 24, 2017
 Samples Submitted: October 6, 2017
 Laboratory Reference: 1710-089
 Project: 14-05806-000

**TOTAL SUSPENDED SOLIDS
SM 2540D**

Matrix: Water
 Units: mg/L

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|------------------------|-----------------------|-----|----------|---------------|---------------|-------|
| Client ID: | COUMI-20171006 | | | | | |
| Laboratory ID: | 10-089-01 | | | | | |
| Total Suspended Solids | 200 | 1.0 | SM 2540D | 10-9-17 | 10-10-17 | |

| | | | | | | |
|------------------------|-----------------------|-----|----------|---------|----------|--|
| Client ID: | COUMO-20171006 | | | | | |
| Laboratory ID: | 10-089-02 | | | | | |
| Total Suspended Solids | 4.2 | 1.0 | SM 2540D | 10-9-17 | 10-10-17 | |

| | | | | | | |
|------------------------|-----------------------|-----|----------|---------|----------|--|
| Client ID: | EVAMS-20171006 | | | | | |
| Laboratory ID: | 10-089-03 | | | | | |
| Total Suspended Solids | 8.2 | 1.0 | SM 2540D | 10-9-17 | 10-10-17 | |

| | | | | | | |
|------------------------|------------------------|-----|----------|---------|----------|--|
| Client ID: | EVALSS-20171006 | | | | | |
| Laboratory ID: | 10-089-04 | | | | | |
| Total Suspended Solids | 8.6 | 1.0 | SM 2540D | 10-9-17 | 10-10-17 | |

| | | | | | | |
|------------------------|-----------------------|-----|----------|---------|----------|--|
| Client ID: | MONMN-20171006 | | | | | |
| Laboratory ID: | 10-089-05 | | | | | |
| Total Suspended Solids | 26 | 1.0 | SM 2540D | 10-9-17 | 10-10-17 | |

| | | | | | | |
|------------------------|-----------------------|-----|----------|---------|----------|--|
| Client ID: | MONMS-20171006 | | | | | |
| Laboratory ID: | 10-089-06 | | | | | |
| Total Suspended Solids | 2.4 | 1.0 | SM 2540D | 10-9-17 | 10-10-17 | |

| | | | | | | |
|------------------------|----------------------|-----|----------|---------|----------|--|
| Client ID: | MONM-20171006 | | | | | |
| Laboratory ID: | 10-089-07 | | | | | |
| Total Suspended Solids | 11 | 1.0 | SM 2540D | 10-9-17 | 10-10-17 | |



Date of Report: October 24, 2017
 Samples Submitted: October 6, 2017
 Laboratory Reference: 1710-089
 Project: 14-05806-000

**TOTAL SUSPENDED SOLIDS
 SM 2540D**

Matrix: Water
 Units: mg/L

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|------------------------|-----------------------|-----|----------|---------------|---------------|-------|
| Client ID: | SEIMN-20171006 | | | | | |
| Laboratory ID: | 10-089-08 | | | | | |
| Total Suspended Solids | 19 | 1.0 | SM 2540D | 10-9-17 | 10-10-17 | |

| | | | | | | |
|------------------------|-----------------------|-----|----------|---------|----------|--|
| Client ID: | SEIMS-20171006 | | | | | |
| Laboratory ID: | 10-089-09 | | | | | |
| Total Suspended Solids | 5.6 | 1.0 | SM 2540D | 10-9-17 | 10-10-17 | |

| | | | | | | |
|------------------------|-----------------------|-----|----------|---------|----------|--|
| Client ID: | TOSMI-20171006 | | | | | |
| Laboratory ID: | 10-089-10 | | | | | |
| Total Suspended Solids | 1.6 | 1.0 | SM 2540D | 10-9-17 | 10-10-17 | |

| | | | | | | |
|------------------------|-----------------------|-----|----------|---------|----------|--|
| Client ID: | TOSMO-20171006 | | | | | |
| Laboratory ID: | 10-089-11 | | | | | |
| Total Suspended Solids | ND | 1.0 | SM 2540D | 10-9-17 | 10-10-17 | |

| | | | | | | |
|------------------------|-----------------------|-----|----------|---------|----------|--|
| Client ID: | TYLMI-20171006 | | | | | |
| Laboratory ID: | 10-089-12 | | | | | |
| Total Suspended Solids | 11 | 1.0 | SM 2540D | 10-9-17 | 10-10-17 | |

| | | | | | | |
|------------------------|-----------------------|-----|----------|---------|----------|--|
| Client ID: | TYLMO-20171006 | | | | | |
| Laboratory ID: | 10-089-13 | | | | | |
| Total Suspended Solids | 9.8 | 1.0 | SM 2540D | 10-9-17 | 10-10-17 | |

| | | | | | | |
|------------------------|------------------|-----|----------|---------|----------|--|
| Client ID: | QA33-1006 | | | | | |
| Laboratory ID: | 10-089-14 | | | | | |
| Total Suspended Solids | 4.2 | 1.0 | SM 2540D | 10-9-17 | 10-10-17 | |



Date of Report: October 24, 2017
 Samples Submitted: October 6, 2017
 Laboratory Reference: 1710-089
 Project: 14-05806-000

**TOTAL SUSPENDED SOLIDS
 SM 2540D
 QUALITY CONTROL**

Matrix: Water
 Units: mg/L

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|------------------------|-----------|-----|----------|---------------|---------------|-------|
| METHOD BLANK | | | | | | |
| Laboratory ID: | MB1009W1 | | | | | |
| Total Suspended Solids | ND | 1.0 | SM 2540D | 10-9-17 | 10-10-17 | |

| Analyte | Result | Spike Level | Source Result | Percent Recovery | Recovery Limits | RPD | RPD Limit | Flags |
|------------------------|-------------|-------------|---------------|------------------|-----------------|-----|-----------|-------|
| DUPLICATE | | | | | | | | |
| Laboratory ID: | 10-089-14 | | | | | | | |
| | ORIG | DUP | | | | | | |
| Total Suspended Solids | 4.20 | 4.40 | NA | NA | NA | NA | 5 | 20 |

| | | | | | | | | |
|------------------------|-------------|-----|----|----|--------|----|----|--|
| SPIKE BLANK | | | | | | | | |
| Laboratory ID: | SB1009W1 | | | | | | | |
| | SB | SB | | SB | | | | |
| Total Suspended Solids | 94.0 | 100 | NA | 94 | 78-113 | NA | NA | |



Date of Report: October 24, 2017
 Samples Submitted: October 6, 2017
 Laboratory Reference: 1710-089
 Project: 14-05806-000

TURBIDITY
EPA 180.1

Matrix: Water
 Units: NTU

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|-------------------|-----------------------|------|-----------|---------------|---------------|-------|
| Client ID: | COUMI-20171006 | | | | | |
| Laboratory ID: | 10-089-01 | | | | | |
| Turbidity | 26 | 0.10 | EPA 180.1 | 10-6-17 | 10-6-17 | |

| | | | | | | |
|-------------------|-----------------------|------|-----------|---------|---------|--|
| Client ID: | COUMO-20171006 | | | | | |
| Laboratory ID: | 10-089-02 | | | | | |
| Turbidity | 1.5 | 0.10 | EPA 180.1 | 10-6-17 | 10-6-17 | |

| | | | | | | |
|-------------------|-----------------------|------|-----------|---------|---------|--|
| Client ID: | EVAMS-20171006 | | | | | |
| Laboratory ID: | 10-089-03 | | | | | |
| Turbidity | 2.5 | 0.10 | EPA 180.1 | 10-6-17 | 10-6-17 | |

| | | | | | | |
|-------------------|------------------------|------|-----------|---------|---------|--|
| Client ID: | EVALSS-20171006 | | | | | |
| Laboratory ID: | 10-089-04 | | | | | |
| Turbidity | 3.5 | 0.10 | EPA 180.1 | 10-6-17 | 10-6-17 | |

| | | | | | | |
|-------------------|-----------------------|------|-----------|---------|---------|--|
| Client ID: | MONMN-20171006 | | | | | |
| Laboratory ID: | 10-089-05 | | | | | |
| Turbidity | 6.4 | 0.10 | EPA 180.1 | 10-6-17 | 10-6-17 | |

| | | | | | | |
|-------------------|-----------------------|------|-----------|---------|---------|--|
| Client ID: | MONMS-20171006 | | | | | |
| Laboratory ID: | 10-089-06 | | | | | |
| Turbidity | 0.81 | 0.10 | EPA 180.1 | 10-6-17 | 10-6-17 | |

| | | | | | | |
|-------------------|----------------------|------|-----------|---------|---------|--|
| Client ID: | MONM-20171006 | | | | | |
| Laboratory ID: | 10-089-07 | | | | | |
| Turbidity | 2.5 | 0.10 | EPA 180.1 | 10-6-17 | 10-6-17 | |



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 Project: 14-05806-000

TURBIDITY
EPA 180.1

Matrix: Water
 Units: NTU

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|-------------------|-----------------------|------|-----------|---------------|---------------|-------|
| Client ID: | SEIMN-20171006 | | | | | |
| Laboratory ID: | 10-089-08 | | | | | |
| Turbidity | 2.0 | 0.10 | EPA 180.1 | 10-6-17 | 10-6-17 | |

| | | | | | | |
|-------------------|-----------------------|------|-----------|---------|---------|--|
| Client ID: | SEIMS-20171006 | | | | | |
| Laboratory ID: | 10-089-09 | | | | | |
| Turbidity | 1.7 | 0.10 | EPA 180.1 | 10-6-17 | 10-6-17 | |

| | | | | | | |
|-------------------|-----------------------|------|-----------|---------|---------|--|
| Client ID: | TOSMI-20171006 | | | | | |
| Laboratory ID: | 10-089-10 | | | | | |
| Turbidity | 0.45 | 0.10 | EPA 180.1 | 10-6-17 | 10-6-17 | |

| | | | | | | |
|-------------------|-----------------------|------|-----------|---------|---------|--|
| Client ID: | TOSMO-20171006 | | | | | |
| Laboratory ID: | 10-089-11 | | | | | |
| Turbidity | 0.69 | 0.10 | EPA 180.1 | 10-6-17 | 10-6-17 | |

| | | | | | | |
|-------------------|-----------------------|------|-----------|---------|---------|--|
| Client ID: | TYLMI-20171006 | | | | | |
| Laboratory ID: | 10-089-12 | | | | | |
| Turbidity | 4.5 | 0.10 | EPA 180.1 | 10-6-17 | 10-6-17 | |

| | | | | | | |
|-------------------|-----------------------|------|-----------|---------|---------|--|
| Client ID: | TYLMO-20171006 | | | | | |
| Laboratory ID: | 10-089-13 | | | | | |
| Turbidity | 2.0 | 0.10 | EPA 180.1 | 10-6-17 | 10-6-17 | |

| | | | | | | |
|-------------------|------------------|------|-----------|---------|---------|--|
| Client ID: | QA33-1006 | | | | | |
| Laboratory ID: | 10-089-14 | | | | | |
| Turbidity | 2.1 | 0.10 | EPA 180.1 | 10-6-17 | 10-6-17 | |



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 Project: 14-05806-000

**TURBIDITY
 EPA 180.1
 QUALITY CONTROL**

Matrix: Water
 Units: NTU

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|---------------------|-----------|------|-----------|---------------|---------------|-------|
| METHOD BLANK | | | | | | |
| Laboratory ID: | MB1006W1 | | | | | |
| Turbidity | ND | 0.10 | EPA 180.1 | 10-6-17 | 10-6-17 | |

| Analyte | Result | Spike Level | Source Result | Percent Recovery | Recovery Limits | RPD | RPD Limit | Flags |
|------------------|-------------|-------------|---------------|------------------|-----------------|-----|-----------|-------|
| DUPLICATE | | | | | | | | |
| Laboratory ID: | 10-088-01 | | | | | | | |
| | ORIG | DUP | | | | | | |
| Turbidity | 2.15 | 2.15 | NA | NA | NA | NA | 0 | 15 |



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HARDNESS
EPA 200.7/SM 2340B

Matrix: Water
 Units: mg eqt. CaCO₃/L (ppm)

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|-------------------|-----------------------|-----|----------------|---------------|---------------|-------|
| Client ID: | COUMI-20171006 | | | | | |
| Laboratory ID: | 10-089-01 | | | | | |
| Hardness | 160 | 5.0 | 200.7/SM 2340B | 10-13-17 | 10-16-17 | |

| | | | | | | |
|-------------------|-----------------------|-----|----------------|----------|----------|--|
| Client ID: | COUMO-20171006 | | | | | |
| Laboratory ID: | 10-089-02 | | | | | |
| Hardness | 140 | 5.0 | 200.7/SM 2340B | 10-13-17 | 10-16-17 | |

| | | | | | | |
|-------------------|-----------------------|-----|----------------|----------|----------|--|
| Client ID: | EVAMS-20171006 | | | | | |
| Laboratory ID: | 10-089-03 | | | | | |
| Hardness | 110 | 1.0 | 200.7/SM 2340B | 10-13-17 | 10-13-17 | |

| | | | | | | |
|-------------------|------------------------|-----|----------------|----------|----------|--|
| Client ID: | EVALSS-20171006 | | | | | |
| Laboratory ID: | 10-089-04 | | | | | |
| Hardness | 91 | 1.0 | 200.7/SM 2340B | 10-13-17 | 10-13-17 | |

| | | | | | | |
|-------------------|-----------------------|-----|----------------|----------|----------|--|
| Client ID: | MONMN-20171006 | | | | | |
| Laboratory ID: | 10-089-05 | | | | | |
| Hardness | 83 | 1.0 | 200.7/SM 2340B | 10-13-17 | 10-16-17 | |

| | | | | | | |
|-------------------|-----------------------|-----|----------------|----------|----------|--|
| Client ID: | MONMS-20171006 | | | | | |
| Laboratory ID: | 10-089-06 | | | | | |
| Hardness | 170 | 5.0 | 200.7/SM 2340B | 10-13-17 | 10-16-17 | |

| | | | | | | |
|-------------------|----------------------|-----|----------------|----------|----------|--|
| Client ID: | MONM-20171006 | | | | | |
| Laboratory ID: | 10-089-07 | | | | | |
| Hardness | 100 | 1.0 | 200.7/SM 2340B | 10-13-17 | 10-16-17 | |



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 Project: 14-05806-000

HARDNESS
EPA 200.7/SM 2340B

Matrix: Water
 Units: mg eqt. CaCO₃/L (ppm)

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|-------------------|-----------------------|-----|----------------|---------------|---------------|-------|
| Client ID: | SEIMN-20171006 | | | | | |
| Laboratory ID: | 10-089-08 | | | | | |
| Hardness | 47 | 1.0 | 200.7/SM 2340B | 10-13-17 | 10-16-17 | |

| | | | | | | |
|-------------------|-----------------------|-----|----------------|----------|----------|--|
| Client ID: | SEIMS-20171006 | | | | | |
| Laboratory ID: | 10-089-09 | | | | | |
| Hardness | 52 | 1.0 | 200.7/SM 2340B | 10-13-17 | 10-16-17 | |

| | | | | | | |
|-------------------|-----------------------|-----|----------------|----------|----------|--|
| Client ID: | TOSMI-20171006 | | | | | |
| Laboratory ID: | 10-089-10 | | | | | |
| Hardness | 140 | 1.0 | 200.7/SM 2340B | 10-13-17 | 10-16-17 | |

| | | | | | | |
|-------------------|-----------------------|-----|----------------|----------|----------|--|
| Client ID: | TOSMO-20171006 | | | | | |
| Laboratory ID: | 10-089-11 | | | | | |
| Hardness | 120 | 1.0 | 200.7/SM 2340B | 10-13-17 | 10-16-17 | |

| | | | | | | |
|-------------------|-----------------------|-----|----------------|----------|----------|--|
| Client ID: | TYLMI-20171006 | | | | | |
| Laboratory ID: | 10-089-12 | | | | | |
| Hardness | 110 | 1.0 | 200.7/SM 2340B | 10-13-17 | 10-16-17 | |

| | | | | | | |
|-------------------|-----------------------|-----|----------------|----------|----------|--|
| Client ID: | TYLMO-20171006 | | | | | |
| Laboratory ID: | 10-089-13 | | | | | |
| Hardness | 87 | 1.0 | 200.7/SM 2340B | 10-13-17 | 10-16-17 | |

| | | | | | | |
|-------------------|------------------|-----|----------------|----------|----------|--|
| Client ID: | QA33-1006 | | | | | |
| Laboratory ID: | 10-089-14 | | | | | |
| Hardness | 50 | 1.0 | 200.7/SM 2340B | 10-13-17 | 10-16-17 | |



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**HARDNESS
 EPA 200.7/SM 2340B
 QUALITY CONTROL**

Matrix: Water
 Units: mg eqt. CaCO₃/L (ppm)

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|---------------------|-----------|-----|----------------|---------------|---------------|-------|
| METHOD BLANK | | | | | | |
| Laboratory ID: | MB1013WH3 | | | | | |
| Hardness | ND | 1.0 | 200.7/SM 2340B | 10-13-17 | 10-13-17 | |

| Analyte | Result | Spike Level | Source Result | Percent Recovery | Recovery Limits | RPD | RPD Limit | Flags |
|------------------|------------|-------------|---------------|------------------|-----------------|-----|-----------|-------|
| DUPLICATE | | | | | | | | |
| Laboratory ID: | 10-089-01 | | | | | | | |
| | ORIG | DUP | | | | | | |
| Hardness | 162 | 162 | NA | NA | NA | 0 | 20 | |

| Analyte | Result | Spike Level | Source Result | Percent Recovery | Recovery Limits | RPD | RPD Limit | Flags | | |
|----------------------|------------|-------------|---------------|------------------|-----------------|-----|-----------|--------|---|----|
| MATRIX SPIKES | | | | | | | | | | |
| Laboratory ID: | 10-089-01 | | | | | | | | | |
| | MS | MSD | MS | MSD | MS | MSD | | | | |
| Hardness | 297 | 286 | 132 | 132 | 162 | 102 | 94 | 75-125 | 4 | 20 |

| Analyte | Result | Spike Level | Source Result | Percent Recovery | Recovery Limits | RPD | RPD Limit | Flags |
|--------------------|------------|-------------|---------------|------------------|-----------------|-----|-----------|-------|
| SPIKE BLANK | | | | | | | | |
| Laboratory ID: | SB1013WH3 | | | | | | | |
| | SB | SB | | | SB | | | |
| Hardness | 135 | 132 | NA | 102 | 80-120 | NA | NA | |



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**DISSOLVED ORGANIC CARBON
 SM 5310B**

Matrix: Water
 Units: mg/L

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|--------------------------|------------------------|-----|----------|---------------|---------------|-------|
| Client ID: | COUMI-20171006 | | | | | |
| Laboratory ID: | 10-089-01 | | | | | |
| Dissolved Organic Carbon | 2.4 | 1.0 | SM 5310B | 10-12-17 | 10-12-17 | |
| Client ID: | COUMO-20171006 | | | | | |
| Laboratory ID: | 10-089-02 | | | | | |
| Dissolved Organic Carbon | 2.5 | 1.0 | SM 5310B | 10-12-17 | 10-12-17 | |
| Client ID: | EVAMS-20171006 | | | | | |
| Laboratory ID: | 10-089-03 | | | | | |
| Dissolved Organic Carbon | 2.5 | 1.0 | SM 5310B | 10-12-17 | 10-12-17 | |
| Client ID: | EVALSS-20171006 | | | | | |
| Laboratory ID: | 10-089-04 | | | | | |
| Dissolved Organic Carbon | 1.9 | 1.0 | SM 5310B | 10-12-17 | 10-12-17 | |
| Client ID: | MONMN-20171006 | | | | | |
| Laboratory ID: | 10-089-05 | | | | | |
| Dissolved Organic Carbon | 3.4 | 1.0 | SM 5310B | 10-12-17 | 10-12-17 | |
| Client ID: | MONMS-20171006 | | | | | |
| Laboratory ID: | 10-089-06 | | | | | |
| Dissolved Organic Carbon | 3.5 | 1.0 | SM 5310B | 10-12-17 | 10-12-17 | |
| Client ID: | MONM-20171006 | | | | | |
| Laboratory ID: | 10-089-07 | | | | | |
| Dissolved Organic Carbon | 2.8 | 1.0 | SM 5310B | 10-12-17 | 10-12-17 | |



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 Project: 14-05806-000

**DISSOLVED ORGANIC CARBON
 SM 5310B**

Matrix: Water
 Units: mg/L

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|--------------------------|-----------------------|-----|----------|---------------|---------------|-------|
| Client ID: | SEIMN-20171006 | | | | | |
| Laboratory ID: | 10-089-08 | | | | | |
| Dissolved Organic Carbon | 1.3 | 1.0 | SM 5310B | 10-12-17 | 10-12-17 | |
| Client ID: | SEIMS-20171006 | | | | | |
| Laboratory ID: | 10-089-09 | | | | | |
| Dissolved Organic Carbon | 3.0 | 1.0 | SM 5310B | 10-12-17 | 10-12-17 | |
| Client ID: | TOSMI-20171006 | | | | | |
| Laboratory ID: | 10-089-10 | | | | | |
| Dissolved Organic Carbon | 2.5 | 1.0 | SM 5310B | 10-12-17 | 10-12-17 | |
| Client ID: | TOSMO-20171006 | | | | | |
| Laboratory ID: | 10-089-11 | | | | | |
| Dissolved Organic Carbon | 2.2 | 1.0 | SM 5310B | 10-12-17 | 10-12-17 | |
| Client ID: | TYLMI-20171006 | | | | | |
| Laboratory ID: | 10-089-12 | | | | | |
| Dissolved Organic Carbon | 1.8 | 1.0 | SM 5310B | 10-12-17 | 10-12-17 | |
| Client ID: | TYLMO-20171006 | | | | | |
| Laboratory ID: | 10-089-13 | | | | | |
| Dissolved Organic Carbon | 3.1 | 1.0 | SM 5310B | 10-12-17 | 10-12-17 | |
| Client ID: | QA33-1006 | | | | | |
| Laboratory ID: | 10-089-14 | | | | | |
| Dissolved Organic Carbon | 2.8 | 1.0 | SM 5310B | 10-12-17 | 10-12-17 | |



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 Project: 14-05806-000

**DISSOLVED ORGANIC CARBON
 SM 5310B
 QUALITY CONTROL**

Matrix: Water
 Units: mg/L

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|--------------------------|-----------|-----|----------|---------------|---------------|-------|
| METHOD BLANK | | | | | | |
| Laboratory ID: | MB1012D1 | | | | | |
| Dissolved Organic Carbon | ND | 1.0 | SM 5310B | 10-12-17 | 10-12-17 | |

| Analyte | Result | Spike Level | Source Result | Percent Recovery | Recovery Limits | RPD | RPD Limit | Flags |
|--------------------------|-------------|-------------|---------------|------------------|-----------------|-----|-----------|-------|
| DUPLICATE | | | | | | | | |
| Laboratory ID: | 10-089-01 | | | | | | | |
| | ORIG | DUP | | | | | | |
| Dissolved Organic Carbon | 2.38 | 2.28 | NA | NA | NA | 4 | 20 | |

MATRIX SPIKE

| | | | | | | | | |
|--------------------------|-------------|------|------|-----|--------|----|----|--|
| Laboratory ID: | 10-089-01 | | | | | | | |
| | MS | MS | | MS | | | | |
| Dissolved Organic Carbon | 12.6 | 10.0 | 2.38 | 102 | 75-125 | NA | NA | |

SPIKE BLANK

| | | | | | | | | |
|--------------------------|-------------|------|----|-----|--------|----|----|--|
| Laboratory ID: | SB1012D1 | | | | | | | |
| | SB | SB | | SB | | | | |
| Dissolved Organic Carbon | 11.0 | 10.0 | NA | 110 | 75-125 | NA | NA | |



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TOTAL PHOSPHORUS
EPA 365.1

Matrix: Water
 Units: mg/L

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|-------------------|-----------------------|-------|-----------|---------------|---------------|-------|
| Client ID: | COUMI-20171006 | | | | | |
| Laboratory ID: | 10-089-01 | | | | | |
| Total Phosphorus | 0.13 | 0.010 | EPA 365.1 | 10-10-17 | 10-10-17 | |

| | | | | | | |
|-------------------|-----------------------|-------|-----------|----------|----------|--|
| Client ID: | COUMO-20171006 | | | | | |
| Laboratory ID: | 10-089-02 | | | | | |
| Total Phosphorus | 0.070 | 0.010 | EPA 365.1 | 10-10-17 | 10-10-17 | |

| | | | | | | |
|-------------------|-----------------------|-------|-----------|----------|----------|--|
| Client ID: | EVAMS-20171006 | | | | | |
| Laboratory ID: | 10-089-03 | | | | | |
| Total Phosphorus | 0.012 | 0.010 | EPA 365.1 | 10-10-17 | 10-10-17 | |

| | | | | | | |
|-------------------|------------------------|-------|-----------|----------|----------|--|
| Client ID: | EVALSS-20171006 | | | | | |
| Laboratory ID: | 10-089-04 | | | | | |
| Total Phosphorus | 0.017 | 0.010 | EPA 365.1 | 10-10-17 | 10-10-17 | |

| | | | | | | |
|-------------------|-----------------------|-------|-----------|----------|----------|--|
| Client ID: | MONMN-20171006 | | | | | |
| Laboratory ID: | 10-089-05 | | | | | |
| Total Phosphorus | 0.068 | 0.010 | EPA 365.1 | 10-10-17 | 10-10-17 | |

| | | | | | | |
|-------------------|-----------------------|-------|-----------|----------|----------|--|
| Client ID: | MONMS-20171006 | | | | | |
| Laboratory ID: | 10-089-06 | | | | | |
| Total Phosphorus | 0.029 | 0.010 | EPA 365.1 | 10-10-17 | 10-10-17 | |

| | | | | | | |
|-------------------|----------------------|-------|-----------|----------|----------|--|
| Client ID: | MONM-20171006 | | | | | |
| Laboratory ID: | 10-089-07 | | | | | |
| Total Phosphorus | 0.043 | 0.010 | EPA 365.1 | 10-10-17 | 10-10-17 | |



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 Project: 14-05806-000

TOTAL PHOSPHORUS
EPA 365.1

Matrix: Water
 Units: mg/L

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|-------------------|-----------------------|-------|-----------|---------------|---------------|-------|
| Client ID: | SEIMN-20171006 | | | | | |
| Laboratory ID: | 10-089-08 | | | | | |
| Total Phosphorus | 0.053 | 0.010 | EPA 365.1 | 10-10-17 | 10-10-17 | |

| | | | | | | |
|-------------------|-----------------------|-------|-----------|----------|----------|--|
| Client ID: | SEIMS-20171006 | | | | | |
| Laboratory ID: | 10-089-09 | | | | | |
| Total Phosphorus | 0.037 | 0.010 | EPA 365.1 | 10-10-17 | 10-10-17 | |

| | | | | | | |
|-------------------|-----------------------|-------|-----------|----------|----------|--|
| Client ID: | TOSMI-20171006 | | | | | |
| Laboratory ID: | 10-089-10 | | | | | |
| Total Phosphorus | 0.066 | 0.010 | EPA 365.1 | 10-10-17 | 10-10-17 | |

| | | | | | | |
|-------------------|-----------------------|-------|-----------|----------|----------|--|
| Client ID: | TOSMO-20171006 | | | | | |
| Laboratory ID: | 10-089-11 | | | | | |
| Total Phosphorus | 0.066 | 0.010 | EPA 365.1 | 10-10-17 | 10-10-17 | |

| | | | | | | |
|-------------------|-----------------------|-------|-----------|----------|----------|--|
| Client ID: | TYLMI-20171006 | | | | | |
| Laboratory ID: | 10-089-12 | | | | | |
| Total Phosphorus | 0.028 | 0.010 | EPA 365.1 | 10-10-17 | 10-10-17 | |

| | | | | | | |
|-------------------|-----------------------|-------|-----------|----------|----------|--|
| Client ID: | TYLMO-20171006 | | | | | |
| Laboratory ID: | 10-089-13 | | | | | |
| Total Phosphorus | 0.065 | 0.010 | EPA 365.1 | 10-10-17 | 10-10-17 | |

| | | | | | | |
|-------------------|------------------|-------|-----------|----------|----------|--|
| Client ID: | QA33-1006 | | | | | |
| Laboratory ID: | 10-089-14 | | | | | |
| Total Phosphorus | 0.036 | 0.010 | EPA 365.1 | 10-10-17 | 10-10-17 | |



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**TOTAL PHOSPHORUS
 EPA 365.1
 QUALITY CONTROL**

Matrix: Water
 Units: mg/L

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|---------------------|-----------|-------|-----------|---------------|---------------|-------|
| METHOD BLANK | | | | | | |
| Laboratory ID: | MB1010W1 | | | | | |
| Total Phosphorus | ND | 0.010 | EPA 365.1 | 10-10-17 | 10-10-17 | |

| Analyte | Result | Spike Level | Source Result | Percent Recovery | Recovery Limits | RPD | RPD Limit | Flags |
|------------------|---------------|---------------|---------------|------------------|-----------------|-----|-----------|-------|
| DUPLICATE | | | | | | | | |
| Laboratory ID: | 10-088-01 | | | | | | | |
| | ORIG | DUP | | | | | | |
| Total Phosphorus | 0.0239 | 0.0257 | NA | NA | NA | NA | 7 | 11 |

| | | | | | | | | |
|---------------------|--------------|-------|--------|-----|--------|----|----|--|
| MATRIX SPIKE | | | | | | | | |
| Laboratory ID: | 10-088-01 | | | | | | | |
| | MS | MS | | MS | | | | |
| Total Phosphorus | 0.282 | 0.250 | 0.0239 | 103 | 86-115 | NA | NA | |

| | | | | | | | | |
|--------------------|--------------|-------|----|----|--------|----|----|--|
| SPIKE BLANK | | | | | | | | |
| Laboratory ID: | SB1010W1 | | | | | | | |
| | SB | SB | | SB | | | | |
| Total Phosphorus | 0.248 | 0.250 | NA | 99 | 86-111 | NA | NA | |



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**TOTAL METALS
 EPA 200.8**

Matrix: Water
 Units: ug/L (ppb)

| Analyte | Result | PQL | EPA Method | Date Prepared | Date Analyzed | Flags |
|-----------------------------------|---------------|------------|-------------------|----------------------|----------------------|--------------|
| Lab ID: 10-089-01 | | | | | | |
| Client ID: COUMI-20171006 | | | | | | |
| Copper | ND | 1.0 | 200.8 | 10-13-17 | 10-16-17 | |
| Zinc | ND | 5.0 | 200.8 | 10-13-17 | 10-16-17 | |
| Lab ID: 10-089-02 | | | | | | |
| Client ID: COUMO-20171006 | | | | | | |
| Copper | ND | 1.0 | 200.8 | 10-13-17 | 10-16-17 | |
| Zinc | ND | 5.0 | 200.8 | 10-13-17 | 10-16-17 | |
| Lab ID: 10-089-03 | | | | | | |
| Client ID: EVAMS-20171006 | | | | | | |
| Copper | ND | 1.0 | 200.8 | 10-13-17 | 10-16-17 | |
| Zinc | ND | 5.0 | 200.8 | 10-13-17 | 10-16-17 | |
| Lab ID: 10-089-04 | | | | | | |
| Client ID: EVALSS-20171006 | | | | | | |
| Copper | ND | 1.0 | 200.8 | 10-13-17 | 10-16-17 | |
| Zinc | ND | 5.0 | 200.8 | 10-13-17 | 10-16-17 | |
| Lab ID: 10-089-05 | | | | | | |
| Client ID: MONMN-20171006 | | | | | | |
| Copper | ND | 1.0 | 200.8 | 10-13-17 | 10-16-17 | |
| Zinc | 14 | 5.0 | 200.8 | 10-13-17 | 10-16-17 | |
| Lab ID: 10-089-06 | | | | | | |
| Client ID: MONMS-20171006 | | | | | | |
| Copper | ND | 1.0 | 200.8 | 10-13-17 | 10-16-17 | |
| Zinc | ND | 5.0 | 200.8 | 10-13-17 | 10-16-17 | |



Date of Report: October 24, 2017
 Samples Submitted: October 6, 2017
 Laboratory Reference: 1710-089
 Project: 14-05806-000

TOTAL METALS
EPA 200.8

Matrix: Water
 Units: ug/L (ppb)

| Analyte | Result | PQL | EPA Method | Date Prepared | Date Analyzed | Flags |
|-------------------|-----------------------|-----|------------|---------------|---------------|-------|
| Lab ID: | 10-089-07 | | | | | |
| Client ID: | MONM-20171006 | | | | | |
| Copper | ND | 1.0 | 200.8 | 10-13-17 | 10-16-17 | |
| Zinc | 5.8 | 5.0 | 200.8 | 10-13-17 | 10-16-17 | |
| Lab ID: | 10-089-08 | | | | | |
| Client ID: | SEIMN-20171006 | | | | | |
| Copper | 1.7 | 1.0 | 200.8 | 10-13-17 | 10-16-17 | |
| Zinc | ND | 5.0 | 200.8 | 10-13-17 | 10-16-17 | |
| Lab ID: | 10-089-09 | | | | | |
| Client ID: | SEIMS-20171006 | | | | | |
| Copper | ND | 1.0 | 200.8 | 10-13-17 | 10-16-17 | |
| Zinc | ND | 5.0 | 200.8 | 10-13-17 | 10-16-17 | |
| Lab ID: | 10-089-10 | | | | | |
| Client ID: | TOSMI-20171006 | | | | | |
| Copper | ND | 1.0 | 200.8 | 10-13-17 | 10-16-17 | |
| Zinc | 7.5 | 5.0 | 200.8 | 10-13-17 | 10-16-17 | |
| Lab ID: | 10-089-11 | | | | | |
| Client ID: | TOSMO-20171006 | | | | | |
| Copper | ND | 1.0 | 200.8 | 10-13-17 | 10-16-17 | |
| Zinc | ND | 5.0 | 200.8 | 10-13-17 | 10-16-17 | |
| Lab ID: | 10-089-12 | | | | | |
| Client ID: | TYLMI-20171006 | | | | | |
| Copper | 1.5 | 1.0 | 200.8 | 10-13-17 | 10-16-17 | |
| Zinc | 5.3 | 5.0 | 200.8 | 10-13-17 | 10-16-17 | |



Date of Report: October 24, 2017
 Samples Submitted: October 6, 2017
 Laboratory Reference: 1710-089
 Project: 14-05806-000

**TOTAL METALS
 EPA 200.8**

Matrix: Water
 Units: ug/L (ppb)

| Analyte | Result | PQL | EPA Method | Date Prepared | Date Analyzed | Flags |
|-------------------|-----------------------|------------|-------------------|----------------------|----------------------|--------------|
| Lab ID: | 10-089-13 | | | | | |
| Client ID: | TYLMO-20171006 | | | | | |
| Copper | 1.4 | 1.0 | 200.8 | 10-13-17 | 10-16-17 | |
| Zinc | 9.9 | 5.0 | 200.8 | 10-13-17 | 10-16-17 | |

| | | | | | | |
|-------------------|------------------|-----|-------|----------|----------|--|
| Lab ID: | 10-089-14 | | | | | |
| Client ID: | QA33-1006 | | | | | |
| Copper | ND | 1.0 | 200.8 | 10-13-17 | 10-16-17 | |
| Zinc | ND | 5.0 | 200.8 | 10-13-17 | 10-16-17 | |



Date of Report: October 24, 2017
Samples Submitted: October 6, 2017
Laboratory Reference: 1710-089
Project: 14-05806-000

**TOTAL METALS
EPA 200.8
METHOD BLANK QUALITY CONTROL**

Date Extracted: 10-13-17
Date Analyzed: 10-16-17

Matrix: Water
Units: ug/L (ppb)

Lab ID: MB1013WH2

| Analyte | Method | Result | PQL |
|---------|--------|-----------|-----|
| Copper | 200.8 | ND | 1.0 |
| Zinc | 200.8 | ND | 5.0 |



Date of Report: October 24, 2017
 Samples Submitted: October 6, 2017
 Laboratory Reference: 1710-089
 Project: 14-05806-000

**TOTAL METALS
 EPA 200.8
 DUPLICATE QUALITY CONTROL**

Date Extracted: 10-13-17

Date Analyzed: 10-16-17

Matrix: Water

Units: ug/L (ppb)

Lab ID: 10-089-14

| Analyte | Sample Result | Duplicate Result | RPD | PQL | Flags |
|---------|---------------|------------------|-----|-----|-------|
| Copper | ND | ND | NA | 1.0 | |
| Zinc | ND | ND | NA | 5.0 | |



Date of Report: October 24, 2017
 Samples Submitted: October 6, 2017
 Laboratory Reference: 1710-089
 Project: 14-05806-000

**TOTAL METALS
 EPA 200.8
 MS/MSD QUALITY CONTROL**

Date Extracted: 10-13-17

Date Analyzed: 10-16-17

Matrix: Water

Units: ug/L (ppb)

Lab ID: 10-089-14

| Analyte | Spike Level | MS | Percent Recovery | MSD | Percent Recovery | RPD | Flags |
|---------|-------------|-------------|------------------|-------------|------------------|-----|-------|
| Copper | 100 | 94.6 | 95 | 95.8 | 96 | 1 | |
| Zinc | 100 | 99.0 | 99 | 101 | 101 | 2 | |



Date of Report: October 24, 2017
 Samples Submitted: October 6, 2017
 Laboratory Reference: 1710-089
 Project: 14-05806-000

**DISSOLVED METALS
 EPA 200.8**

Matrix: Water
 Units: ug/L (ppb)

| Analyte | Result | PQL | EPA Method | Date Prepared | Date Analyzed | Flags |
|-----------------------------------|---------------|------------|-------------------|----------------------|----------------------|--------------|
| Lab ID: 10-089-01 | | | | | | |
| Client ID: COUMI-20171006 | | | | | | |
| Copper | ND | 1.0 | 200.8 | | 10-13-17 | |
| Zinc | ND | 5.0 | 200.8 | | 10-13-17 | |
| Lab ID: 10-089-02 | | | | | | |
| Client ID: COUMO-20171006 | | | | | | |
| Copper | ND | 1.0 | 200.8 | | 10-13-17 | |
| Zinc | ND | 5.0 | 200.8 | | 10-13-17 | |
| Lab ID: 10-089-03 | | | | | | |
| Client ID: EVAMS-20171006 | | | | | | |
| Copper | ND | 1.0 | 200.8 | | 10-13-17 | |
| Zinc | ND | 5.0 | 200.8 | | 10-13-17 | |
| Lab ID: 10-089-04 | | | | | | |
| Client ID: EVALSS-20171006 | | | | | | |
| Copper | ND | 1.0 | 200.8 | | 10-13-17 | |
| Zinc | ND | 5.0 | 200.8 | | 10-13-17 | |
| Lab ID: 10-089-05 | | | | | | |
| Client ID: MONMN-20171006 | | | | | | |
| Copper | ND | 1.0 | 200.8 | | 10-13-17 | |
| Zinc | ND | 5.0 | 200.8 | | 10-13-17 | |
| Lab ID: 10-089-06 | | | | | | |
| Client ID: MONMS-20171006 | | | | | | |
| Copper | ND | 1.0 | 200.8 | | 10-13-17 | |
| Zinc | ND | 5.0 | 200.8 | | 10-13-17 | |



OnSite Environmental, Inc. 14648 NE 95th Street, Redmond, WA 98052 (425) 883-3881

This report pertains to the samples analyzed in accordance with the chain of custody, and is intended only for the use of the individual or company to whom it is addressed.

Date of Report: October 24, 2017
 Samples Submitted: October 6, 2017
 Laboratory Reference: 1710-089
 Project: 14-05806-000

**DISSOLVED METALS
 EPA 200.8**

Matrix: Water
 Units: ug/L (ppb)

| Analyte | Result | PQL | EPA Method | Date | Date | Flags |
|-------------------|-----------------------|-----|------------|----------|----------|-------|
| | | | | Prepared | Analyzed | |
| Lab ID: | 10-089-07 | | | | | |
| Client ID: | MONM-20171006 | | | | | |
| Copper | ND | 1.0 | 200.8 | | 10-13-17 | |
| Zinc | ND | 5.0 | 200.8 | | 10-13-17 | |
| Lab ID: | 10-089-08 | | | | | |
| Client ID: | SEIMN-20171006 | | | | | |
| Copper | ND | 1.0 | 200.8 | | 10-13-17 | |
| Zinc | ND | 5.0 | 200.8 | | 10-13-17 | |
| Lab ID: | 10-089-09 | | | | | |
| Client ID: | SEIMS-20171006 | | | | | |
| Copper | ND | 1.0 | 200.8 | | 10-13-17 | |
| Zinc | ND | 5.0 | 200.8 | | 10-13-17 | |
| Lab ID: | 10-089-10 | | | | | |
| Client ID: | TOSMI-20171006 | | | | | |
| Copper | ND | 1.0 | 200.8 | | 10-13-17 | |
| Zinc | 6.2 | 5.0 | 200.8 | | 10-13-17 | |
| Lab ID: | 10-089-11 | | | | | |
| Client ID: | TOSMO-20171006 | | | | | |
| Copper | ND | 1.0 | 200.8 | | 10-13-17 | |
| Zinc | ND | 5.0 | 200.8 | | 10-13-17 | |
| Lab ID: | 10-089-12 | | | | | |
| Client ID: | TYLMI-20171006 | | | | | |
| Copper | ND | 1.0 | 200.8 | | 10-13-17 | |
| Zinc | ND | 5.0 | 200.8 | | 10-13-17 | |



OnSite Environmental, Inc. 14648 NE 95th Street, Redmond, WA 98052 (425) 883-3881

This report pertains to the samples analyzed in accordance with the chain of custody, and is intended only for the use of the individual or company to whom it is addressed.

Date of Report: October 24, 2017
 Samples Submitted: October 6, 2017
 Laboratory Reference: 1710-089
 Project: 14-05806-000

DISSOLVED METALS
EPA 200.8

Matrix: Water
 Units: ug/L (ppb)

| Analyte | Result | PQL | EPA Method | Date Prepared | Date Analyzed | Flags |
|-------------------|-----------------------|------------|-------------------|----------------------|----------------------|--------------|
| Lab ID: | 10-089-13 | | | | | |
| Client ID: | TYLMO-20171006 | | | | | |
| Copper | ND | 1.0 | 200.8 | | 10-13-17 | |
| Zinc | ND | 5.0 | 200.8 | | 10-13-17 | |

| | | | | | | |
|-------------------|------------------|-----|-------|--|----------|--|
| Lab ID: | 10-089-14 | | | | | |
| Client ID: | QA33-1006 | | | | | |
| Copper | ND | 1.0 | 200.8 | | 10-13-17 | |
| Zinc | ND | 5.0 | 200.8 | | 10-13-17 | |



Date of Report: October 24, 2017
Samples Submitted: October 6, 2017
Laboratory Reference: 1710-089
Project: 14-05806-000

**DISSOLVED METALS
EPA 200.8
METHOD BLANK QUALITY CONTROL**

Date Analyzed: 10-13-17

Matrix: Water
Units: ug/L (ppb)

Lab ID: MB1013D1

| Analyte | Method | Result | PQL |
|---------|--------|-----------|-----|
| Copper | 200.8 | ND | 1.0 |
| Zinc | 200.8 | ND | 5.0 |



Date of Report: October 24, 2017
Samples Submitted: October 6, 2017
Laboratory Reference: 1710-089
Project: 14-05806-000

**DISSOLVED METALS
EPA 200.8
DUPLICATE QUALITY CONTROL**

Date Analyzed: 10-13-17

Matrix: Water
Units: ug/L (ppb)

Lab ID: 10-089-10

| Analyte | Sample Result | Duplicate Result | RPD | PQL | Flags |
|---------|---------------|------------------|-----|-----|-------|
| Copper | ND | ND | NA | 1.0 | |
| Zinc | 6.16 | 5.80 | 6 | 5.0 | |



Date of Report: October 24, 2017
 Samples Submitted: October 6, 2017
 Laboratory Reference: 1710-089
 Project: 14-05806-000

**DISSOLVED METALS
 EPA 200.8
 MS/MSD QUALITY CONTROL**

Date Analyzed: 10-13-17

Matrix: Water
 Units: ug/L (ppb)

Lab ID: 10-089-10

| Analyte | Spike Level | MS | Percent Recovery | MSD | Percent Recovery | RPD | Flags |
|---------|-------------|-------------|------------------|-------------|------------------|-----|-------|
| Copper | 80.0 | 69.2 | 87 | 70.0 | 88 | 1 | |
| Zinc | 80.0 | 79.8 | 92 | 80.2 | 93 | 1 | |





Data Qualifiers and Abbreviations

- A - Due to a high sample concentration, the amount spiked is insufficient for meaningful MS/MSD recovery data.
 - B - The analyte indicated was also found in the blank sample.
 - C - The duplicate RPD is outside control limits due to high result variability when analyte concentrations are within five times the quantitation limit.
 - E - The value reported exceeds the quantitation range and is an estimate.
 - F - Surrogate recovery data is not available due to the high concentration of coeluting target compounds.
 - H - The analyte indicated is a common laboratory solvent and may have been introduced during sample preparation, and be impacting the sample result.
 - I - Compound recovery is outside of the control limits.
 - J - The value reported was below the practical quantitation limit. The value is an estimate.
 - K - Sample duplicate RPD is outside control limits due to sample inhomogeneity. The sample was re-extracted and re-analyzed with similar results.
 - L - The RPD is outside of the control limits.
 - M - Hydrocarbons in the gasoline range are impacting the diesel range result.
 - M1 - Hydrocarbons in the gasoline range (toluene-naphthalene) are present in the sample.
 - N - Hydrocarbons in the lube oil range are impacting the diesel range result.
 - N1 - Hydrocarbons in diesel range are impacting lube oil range results.
 - O - Hydrocarbons indicative of heavier fuels are present in the sample and are impacting the gasoline result.
 - P - The RPD of the detected concentrations between the two columns is greater than 40.
 - Q - Surrogate recovery is outside of the control limits.
 - S - Surrogate recovery data is not available due to the necessary dilution of the sample.
 - T - The sample chromatogram is not similar to a typical _____.
 - U - The analyte was analyzed for, but was not detected above the reported sample quantitation limit.
 - U1 - The practical quantitation limit is elevated due to interferences present in the sample.
 - V - Matrix Spike/Matrix Spike Duplicate recoveries are outside control limits due to matrix effects.
 - W - Matrix Spike/Matrix Spike Duplicate RPD are outside control limits due to matrix effects.
 - X - Sample extract treated with a mercury cleanup procedure.
 - X1 - Sample extract treated with a Sulfuric acid/Silica gel cleanup procedure.
 - Y - The calibration verification for this analyte exceeded the 20% drift specified in method 8260C, and therefore the reported result should be considered an estimate. The overall performance of the calibration verification standard met the acceptance criteria of the method.
 - Z -
- ND - Not Detected at PQL
 PQL - Practical Quantitation Limit
 RPD - Relative Percent Difference





Am Test Inc.
 13600 NE 126TH PL
 Suite C
 Kirkland, WA 98034
 (425) 885-1664

**Professional
 Analytical
 Services**

Oct 23 2017
 On-Site Environmental
 14648 NE 95th ST
 Redmond, WA 98052
 Attention: David Baumeister

Dear David Baumeister:

Enclosed please find the analytical data for your REDMOND PAIRED WATERSHED STUDY project.

The following is a cross correlation of client and laboratory identifications for your convenience.

| CLIENT ID | MATRIX | AMTEST ID | TEST |
|-----------------|--------|------------|------------|
| COUMI-20171006 | Water | 17-A017870 | Micro, NUT |
| COUMO-20171006 | Water | 17-A017871 | Micro, NUT |
| EVAMS-20171006 | Water | 17-A017872 | Micro, NUT |
| EVALSS-20171006 | Water | 17-A017873 | Micro, NUT |
| MONMN-20171006 | Water | 17-A017874 | Micro, NUT |
| MONMS-20171006 | Water | 17-A017875 | Micro, NUT |
| MONM-20171006 | Water | 17-A017876 | Micro, NUT |
| SEIMN-20171006 | Water | 17-A017877 | Micro, NUT |
| SEIMS-20171006 | Water | 17-A017878 | Micro, NUT |
| TOSMI-20171006 | Water | 17-A017879 | Micro, NUT |
| TOSMO-20171006 | Water | 17-A017880 | Micro, NUT |
| TYLMI-20171006 | Water | 17-A017881 | Micro, NUT |
| TYLMO-20171006 | Water | 17-A017882 | Micro, NUT |
| QA-33-20171006 | Water | 17-A017883 | Micro, NUT |

Your samples were received on Friday, October 6, 2017. At the time of receipt, the samples were logged in and properly maintained prior to the subsequent analysis.

The analytical procedures used at AmTest are well documented and are typically derived from the protocols of the EPA, USDA, FDA or the Army Corps of Engineers.

Following the analytical data you will find the Quality Control (QC) results.

Please note that the detection limits that are listed in the body of the report refer to the Practical Quantitation Limits (PQL's), as opposed to the Method Detection Limits (MDL's).

If you should have any questions pertaining to the data package, please feel free to contact me.

Sincerely,



Aaron W. Young
 Laboratory Manager

Project #: 14-05806-000
 PO Number: 10-089

BACT = Bacteriological
 CONV = Conventionals

MET = Metals
 ORG = Organics

NUT=Nutrients
 DEM=Demand

P.1
 MIN=Minerals

Am Test Inc.
13600 NE 126TH PL
Suite C
Kirkland, WA 98034
(425) 885-1664
www.amtestlab.com



*Professional
Analytical
Services*

ANALYSIS REPORT

On-Site Environmental
14648 NE 95th ST
Redmond, WA 98052
Attention: David Baumeister
Project Name: REDMOND PAIRED WATERSHED STUDY
Project #: 14-05806-000
PO Number: 10-089
All results reported on an as received basis.

Date Received: 10/06/17
Date Reported: 10/23/17

AMTEST Identification Number 17-A017870
Client Identification COUMI-20171006
Sampling Date 10/06/17, 09:35

Results

| PARAMETER | RESULT | UNITS | Q | D.L. | METHOD | ANALYST | DATE |
|--------------------------|--------|------------|---|------|-----------|---------|----------|
| Fecal Coliform | 260 | CFU/100 ml | | 10 | SM 9222D | JM | 10/06/17 |
| Total Nitrogen (NOX&TKN) | 0.84 | mg/l | | 0.1 | | | |
| Total Nitrogen (TKN) | 0.251 | mg/l | | 0.1 | SM4500N | JC | 10/19/17 |
| Nitrate + Nitrite | 0.59 | mg/l | | 0.01 | SM4500NO3 | JC | 10/10/17 |

AMTEST Identification Number 17-A017871
Client Identification COUMO-20171006
Sampling Date 10/06/17, 10:35

Results

| PARAMETER | RESULT | UNITS | Q | D.L. | METHOD | ANALYST | DATE |
|--------------------------|--------|------------|---|------|-----------|---------|----------|
| Fecal Coliform | 420 | CFU/100 ml | | 10 | SM 9222D | JM | 10/06/17 |
| Total Nitrogen (NOX&TKN) | 0.49 | mg/l | | 0.1 | | | |
| Total Nitrogen (TKN) | < 0.1 | mg/l | | 0.1 | SM4500N | JC | 10/19/17 |
| Nitrate + Nitrite | 0.49 | mg/l | | 0.01 | SM4500NO3 | JC | 10/10/17 |

AMTEST Identification Number 17-A017872
Client Identification EVAMS-20171006
Sampling Date 10/06/17, 11:30

Results

| PARAMETER | RESULT | UNITS | Q | D.L. | METHOD | ANALYST | DATE |
|--------------------------|--------|------------|---|------|-----------|---------|----------|
| Fecal Coliform | 90. | CFU/100 ml | | 10 | SM 9222D | JM | 10/06/17 |
| Total Nitrogen (NOX&TKN) | 2.14 | mg/l | | 0.1 | | | |
| Total Nitrogen (TKN) | 0.142 | mg/l | | 0.1 | SM4500N | JC | 10/19/17 |
| Nitrate + Nitrite | 2.0 | mg/l | | 0.01 | SM4500NO3 | JC | 10/10/17 |

AMTEST Identification Number 17-A017873
Client Identification EVALSS-20171006
Sampling Date 10/06/17, 11:45

Results

| PARAMETER | RESULT | UNITS | Q | D.L. | METHOD | ANALYST | DATE |
|--------------------------|--------|------------|---|------|-----------|---------|----------|
| Fecal Coliform | 80. | CFU/100 ml | | 10 | SM 9222D | JM | 10/06/17 |
| Total Nitrogen (NOX&TKN) | 1.72 | mg/l | | 0.1 | | | |
| Total Nitrogen (TKN) | 0.125 | mg/l | | 0.1 | SM4500N | JC | 10/19/17 |
| Nitrate + Nitrite | 1.6 | mg/l | | 0.01 | SM4500NO3 | JC | 10/10/17 |

AMTEST Identification Number 17-A017874
Client Identification MONMN-20171006
Sampling Date 10/06/17, 13:10

Results

| PARAMETER | RESULT | UNITS | Q | D.L. | METHOD | ANALYST | DATE |
|--------------------------|--------|------------|---|------|-----------|---------|----------|
| Fecal Coliform | 60. | CFU/100 ml | | 10 | SM 9222D | JM | 10/06/17 |
| Total Nitrogen (NOX&TKN) | 0.47 | mg/l | | 0.1 | | | |
| Total Nitrogen (TKN) | 0.138 | mg/l | | 0.1 | SM4500N | JC | 10/19/17 |
| Nitrate + Nitrite | 0.33 | mg/l | | 0.01 | SM4500NO3 | JC | 10/10/17 |

AMTEST Identification Number 17-A017875
Client Identification MONMS-20171006
Sampling Date 10/06/17, 13:20

Results

| PARAMETER | RESULT | UNITS | Q | D.L. | METHOD | ANALYST | DATE |
|--------------------------|--------|------------|---|------|-----------|---------|----------|
| Fecal Coliform | 30. | CFU/100 ml | | 10 | SM 9222D | JM | 10/06/17 |
| Total Nitrogen (NOX&TKN) | 0.11 | mg/l | | 0.1 | | | |
| Total Nitrogen (TKN) | 0.108 | mg/l | | 0.1 | SM4500N | JC | 10/19/17 |
| Nitrate + Nitrite | < 0.01 | mg/l | | 0.01 | SM4500NO3 | JC | 10/10/17 |

AMTEST Identification Number 17-A017876
Client Identification MONM-20171006
Sampling Date 10/06/17, 14:20

Results

| PARAMETER | RESULT | UNITS | Q | D.L. | METHOD | ANALYST | DATE |
|--------------------------|--------|------------|---|------|-----------|---------|----------|
| Fecal Coliform | 70. | CFU/100 ml | | 10 | SM 9222D | JM | 10/06/17 |
| Total Nitrogen (NOX&TKN) | 0.37 | mg/l | | 0.1 | | | |
| Total Nitrogen (TKN) | 0.187 | mg/l | | 0.1 | SM4500N | JC | 10/19/17 |
| Nitrate + Nitrite | 0.18 | mg/l | | 0.01 | SM4500NO3 | JC | 10/10/17 |

AMTEST Identification Number 17-A017877
Client Identification SEIMN-20171006
Sampling Date 10/06/17, 14:55

Results

| PARAMETER | RESULT | UNITS | Q | D.L. | METHOD | ANALYST | DATE |
|--------------------------|--------|------------|---|------|-----------|---------|----------|
| Fecal Coliform | 360 | CFU/100 ml | | 10 | SM 9222D | JM | 10/06/17 |
| Total Nitrogen (NOX&TKN) | 0.40 | mg/l | | 0.1 | | | |
| Total Nitrogen (TKN) | 0.113 | mg/l | | 0.1 | SM4500N | JC | 10/19/17 |
| Nitrate + Nitrite | 0.29 | mg/l | | 0.01 | SM4500NO3 | JC | 10/10/17 |

AMTEST Identification Number 17-A017878
Client Identification SEIMS-20171006
Sampling Date 10/06/17, 13:45

Results

| PARAMETER | RESULT | UNITS | Q | D.L. | METHOD | ANALYST | DATE |
|--------------------------|--------|------------|---|------|-----------|---------|----------|
| Fecal Coliform | 80. | CFU/100 ml | | 10 | SM 9222D | JM | 10/06/17 |
| Total Nitrogen (NOX&TKN) | 0.38 | mg/l | | 0.1 | | | |
| Total Nitrogen (TKN) | 0.101 | mg/l | | 0.1 | SM4500N | JC | 10/19/17 |
| Nitrate + Nitrite | 0.28 | mg/l | | 0.01 | SM4500NO3 | JC | 10/10/17 |

AMTEST Identification Number 17-A017879
Client Identification TOSMI-20171006
Sampling Date 10/06/17, 10:56

Results

| PARAMETER | RESULT | UNITS | Q | D.L. | METHOD | ANALYST | DATE |
|--------------------------|--------|------------|---|------|-----------|---------|----------|
| Fecal Coliform | 130 | CFU/100 ml | | 10 | SM 9222D | JM | 10/06/17 |
| Total Nitrogen (NOX&TKN) | 0.82 | mg/l | | 0.1 | | | |
| Total Nitrogen (TKN) | < 0.1 | mg/l | | 0.1 | SM4500N | JC | 10/19/17 |
| Nitrate + Nitrite | 0.82 | mg/l | | 0.01 | SM4500NO3 | JC | 10/10/17 |

AMTEST Identification Number 17-A017880
Client Identification TOSMO-20171006
Sampling Date 10/06/17, 10:15

Results

| PARAMETER | RESULT | UNITS | Q | D.L. | METHOD | ANALYST | DATE |
|--------------------------|--------|------------|---|------|-----------|---------|----------|
| Fecal Coliform | 150 | CFU/100 ml | | 10 | SM 9222D | JM | 10/06/17 |
| Total Nitrogen (NOX&TKN) | 0.73 | mg/l | | 0.1 | | | |
| Total Nitrogen (TKN) | 0.110 | mg/l | | 0.1 | SM4500N | JC | 10/19/17 |
| Nitrate + Nitrite | 0.62 | mg/l | | 0.01 | SM4500NO3 | JC | 10/10/17 |

AMTEST Identification Number 17-A017881
Client Identification TYLMI-20171006
Sampling Date 10/06/17, 12:35

Results

| PARAMETER | RESULT | UNITS | Q | D.L. | METHOD | ANALYST | DATE |
|--------------------------|--------|------------|---|------|-----------|---------|----------|
| Fecal Coliform | < 10 | CFU/100 ml | | 10 | SM 9222D | JM | 10/06/17 |
| Total Nitrogen (NOX&TKN) | 1.25 | mg/l | | 0.1 | | | |
| Total Nitrogen (TKN) | 0.146 | mg/l | | 0.1 | SM4500N | JC | 10/19/17 |
| Nitrate + Nitrite | 1.1 | mg/l | | 0.01 | SM4500NO3 | JC | 10/10/17 |

AMTEST Identification Number 17-A017882
Client Identification TYLMO-20171006
Sampling Date 10/06/17, 12:50

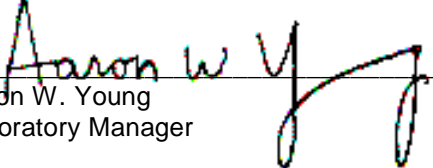
Results

| PARAMETER | RESULT | UNITS | Q | D.L. | METHOD | ANALYST | DATE |
|--------------------------|--------|------------|---|------|-----------|---------|----------|
| Fecal Coliform | 170 | CFU/100 ml | | 10 | SM 9222D | JM | 10/06/17 |
| Total Nitrogen (NOX&TKN) | 0.45 | mg/l | | 0.1 | | | |
| Total Nitrogen (TKN) | 0.112 | mg/l | | 0.1 | SM4500N | JC | 10/19/17 |
| Nitrate + Nitrite | 0.34 | mg/l | | 0.01 | SM4500NO3 | JC | 10/10/17 |

AMTEST Identification Number 17-A017883
Client Identification QA-33-20171006
Sampling Date 10/06/17, 13:55

Results

| PARAMETER | RESULT | UNITS | Q | D.L. | METHOD | ANALYST | DATE |
|--------------------------|--------|------------|---|------|-----------|---------|----------|
| Fecal Coliform | < 10 | CFU/100 ml | | 10 | SM 9222D | JM | 10/06/17 |
| Total Nitrogen (NOX&TKN) | 0.74 | mg/l | | 0.1 | | | |
| Total Nitrogen (TKN) | 0.130 | mg/l | | 0.1 | SM4500N | JC | 10/19/17 |
| Nitrate + Nitrite | 0.61 | mg/l | | 0.01 | SM4500NO3 | JC | 10/10/17 |


Aaron W. Young
Laboratory Manager

QC Summary for sample numbers: 17-A017870 to 17-A017883

DUPLICATES

| SAMPLE # | ANALYTE | UNITS | SAMPLE VALUE | DUP VALUE | RPD |
|------------|----------------------|------------|--------------|-----------|------|
| 17-A017870 | Fecal Coliform | CFU/100 ml | 260 | 380 | 38. |
| 17-A017885 | Fecal Coliform | CFU/100 ml | 190 | 160 | 17. |
| 17-A017876 | Total Nitrogen (TKN) | mg/l | 0.187 | 0.172 | 8.4 |
| 17-A017884 | Total Nitrogen (TKN) | mg/l | 1.90 | 1.80 | 5.4 |
| 17-A017989 | Total Nitrogen (TKN) | mg/l | 0.211 | 0.206 | 2.4 |
| 17-A018060 | Total Nitrogen (TKN) | mg/l | < 0.1 | < 0.1 | |
| 17-A018230 | Total Nitrogen (TKN) | mg/l | 0.226 | 0.226 | 0.00 |
| 17-A017573 | Nitrate + Nitrite | mg/l | 0.13 | 0.12 | 8.0 |
| 17-A017626 | Nitrate + Nitrite | mg/l | < 0.01 | < 0.01 | |
| 17-A017874 | Nitrate + Nitrite | mg/l | 0.33 | 0.25 | 28. |
| 17-A017884 | Nitrate + Nitrite | mg/l | 2.4 | 2.5 | 4.1 |

MATRIX SPIKES

| SAMPLE # | ANALYTE | UNITS | SAMPLE VALUE | SMPL+ SPK | SPK AMT | RECOVERY |
|------------|----------------------|-------|--------------|-----------|---------|----------|
| 17-A017876 | Total Nitrogen (TKN) | mg/l | 0.187 | 2.14 | 2.00 | 97.65 % |
| 17-A017884 | Total Nitrogen (TKN) | mg/l | 1.90 | 3.90 | 2.00 | 100.00 % |
| 17-A017989 | Total Nitrogen (TKN) | mg/l | 0.211 | 2.30 | 2.00 | 104.45 % |
| 17-A018060 | Total Nitrogen (TKN) | mg/l | < 0.1 | 2.12 | 2.00 | 106.00 % |
| 17-A018230 | Total Nitrogen (TKN) | mg/l | 0.226 | 2.29 | 2.00 | 103.20 % |
| 17-A017573 | Nitrate + Nitrite | mg/l | 0.13 | 1.1 | 1.0 | 97.00 % |
| 17-A017626 | Nitrate + Nitrite | mg/l | < 0.01 | 1.0 | 1.0 | 100.00 % |
| 17-A017874 | Nitrate + Nitrite | mg/l | 0.33 | 1.3 | 1.0 | 97.00 % |
| 17-A017884 | Nitrate + Nitrite | mg/l | 2.4 | 8.0 | 5.0 | 112.00 % |

STANDARD REFERENCE MATERIALS

| ANALYTE | UNITS | TRUE VALUE | MEASURED VALUE | RECOVERY |
|----------------------|-------|------------|----------------|----------|
| Total Nitrogen (TKN) | mg/l | 1.00 | 0.988 | 98.8 % |
| Total Nitrogen (TKN) | mg/l | 1.00 | 0.995 | 99.5 % |
| Nitrate + Nitrite | mg/l | 1.0 | 1.0 | 100. % |
| Nitrate + Nitrite | mg/l | 1.0 | 1.0 | 100. % |

BLANKS

| ANALYTE | UNITS | RESULT |
|----------------------|------------|--------|
| Fecal Coliform | CFU/100 ml | < 1 |
| Fecal Coliform | CFU/100 ml | < 1 |
| Total Nitrogen (TKN) | mg/l | < 0.1 |
| Total Nitrogen (TKN) | mg/l | < 0.1 |
| Nitrate + Nitrite | mg/l | < 0.01 |

QC Summary for sample numbers: 17-A017870 to 17-A017883...

BLANKS continued....

| ANALYTE | UNITS | RESULT |
|-------------------|-------|--------|
| Nitrate + Nitrite | mg/l | < 0.01 |



14648 NE 95th Street, Redmond, WA 98052 · (425) 883-3881

Laboratory: AmTest Laboratories

Attention: Aaron Young

13600 NE 126th PI Kirkland, WA 98034

Phone Number: (425) 885-1664

Turnaround Request

1 Day 2 Day 3 Day

Standard

Other: _____

Laboratory Reference #: 10-089

Project Manager: Blair Goodrow

email: bgoodrow@onsite-env.com

Project Number: 14-05806-000

Project Name: Redmond Paired Watershed Study

| Lab ID | Sample Identification | Date Sampled | Time Sampled | Matrix | # of Cont. | Requested Analyses |
|--|-----------------------|--------------|--------------|--------|------------|---|
| 17870 71 72 73 74 75 76 77 78 1 | COUMI-20171006 | 10/6/17 | 0935 | Water | 2 | Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N |
| 2 | COUMO-20171006 | 10/6/17 | 1035 | Water | 2 | Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N |
| 3 | EVAMS-20171006 | 10/6/17 | 1130 | Water | 2 | Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N |
| 4 | EVALSS-20171006 | 10/6/17 | 1145 | Water | 2 | Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N |
| 5 | MONMN-20171006 | 10/6/17 | 1310 | Water | 2 | Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N |
| 6 | MONMS-20171006 | 10/6/17 | 1320 | Water | 2 | Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N |
| 7 | MONM-20171006 | 10/6/17 | 1420 | Water | 2 | Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N |
| 8 | SEIMN-20171006 | 10/6/17 | 1455 | Water | 2 | Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N |
| 9 | SEIMS-20171006 | 10/6/17 | 1345 | Water | 2 | Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N |

| Signature | Company | Date | Time | Comments/Special Instructions |
|------------------|---------|---------|------|--|
| Relinquished by: | OSE | 10/6/17 | 437 | EDDs - CSV Reporting Limits: Fecal Coliform - 1.0 cfu/100ml Total Nitrogen - .10 mg/L |
| Received by: | T = 561 | 10/6/17 | 437 | |
| Relinquished by: | | | | |
| Received by: | | | | |
| Relinquished by: | | | | |
| Received by: | | | | |



14648 NE 95th Street, Redmond, WA 98052 · (425) 883-3881

Laboratory: AmTest Laboratories

Attention: Aaron Young

13600 NE 126th PI Kirkland, WA 98034

Phone Number: (425) 885-1664

Turnaround Request

1 Day 2 Day 3 Day

Standard

Other: _____

Laboratory Reference #: 10-089




Project Manager: Blair Goodrow

email: bgoodrow@onsite-env.com

Project Number: 14-05806-000

Project Name: Redmond Paired Watershed Study

| Lab ID | Sample Identification | Date Sampled | Time Sampled | Matrix | # of Cont. | Requested Analyses |
|--------|-----------------------|--------------|--------------|--------|------------|---|
| 10 | TOSMI-20171006 | 10/6/17 | 1056 | Water | 2 | Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N |
| 11 | TOSMO-20171006 | 10/6/17 | 1015 | Water | 2 | Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N |
| 12 | TYLMI-20171006 | 10/6/17 | 1235 | Water | 2 | Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N |
| 13 | TYLMO-20171006 | 10/6/17 | 1250 | Water | 2 | Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N |
| 14 | QA-33-20171006 | 10/6/17 | 1355 | Water | 2 | Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |

| Signature | Company | Date | Time | Comments/Special Instructions |
|--|----------------|------|------|--|
| Relinquished by:  | OSE | 10/6 | 4:37 | EDDs - CSV Reporting Limits: Fecal Coliform - 1.0 cfu/100ml Total Nitrogen - .10 mg/L |
| Received by:  | | 10/6 | 4:37 | |
| Relinquished by:  | T=5.1 | | | |
| Received by: | | | | |
| Relinquished by: | | | | |
| Received by: | | | | |



14648 NE 95th Street, Redmond, WA 98052
Telephone: 425.883.3881

Company: Herrera Environmental Consultants
Project No.: 14-05806-000
Project Name: Redmond Paired Watershed Study
Project Manager: George Iftner

CHAIN OF CUSTODY

Turnaround Requested:

1 Day

2 Day

3 Day

Standard

Laboratory No. **10-089**

Requested Analyses

| Total Suspended Solids (SM 2540D) | Turbidity (EPA 181.1) | Hardness (EPA 200.7 / SM 2340B) | Dissolved Organ Carbon (SM 5310B) * | Fecal Coliform (SM 9222D) | Total Phosphorus (EPA 365.1) | Total Nitrogen (SM 4500 N-B) | Total Cu and Zn (EPA 200.8) | Dissolved Cu and Zn (EPA 200.8) * |
|-----------------------------------|-----------------------|---------------------------------|-------------------------------------|---------------------------|------------------------------|------------------------------|-----------------------------|-----------------------------------|
|-----------------------------------|-----------------------|---------------------------------|-------------------------------------|---------------------------|------------------------------|------------------------------|-----------------------------|-----------------------------------|

| Lab ID | Sample Identification | Date Sampled | Time Sampled | Matrix | # of Cont. | Total Suspended Solids (SM 2540D) | Turbidity (EPA 181.1) | Hardness (EPA 200.7 / SM 2340B) | Dissolved Organ Carbon (SM 5310B) * | Fecal Coliform (SM 9222D) | Total Phosphorus (EPA 365.1) | Total Nitrogen (SM 4500 N-B) | Total Cu and Zn (EPA 200.8) | Dissolved Cu and Zn (EPA 200.8) * |
|--------|---------------------------|--------------------|--------------|--------|------------|-----------------------------------|-----------------------|---------------------------------|-------------------------------------|---------------------------|------------------------------|------------------------------|-----------------------------|-----------------------------------|
| | COLM-2017 1006 | 10/6/17 | | Water | 7 | X | X | X | X | X | X | X | X | X |
| 1 | COUMI-2017 1006 | 10/6/17 | 9:35 | Water | 7 | X | X | X | X | X | X | X | X | X |
| 2 | COUMO-2017 1006 | | 10:35 | Water | 7 | X | X | X | X | X | X | X | X | X |
| 3 | EVAMS-2017 1006 | | 11:30 | Water | 7 | X | X | X | X | X | X | X | X | X |
| 4 | EVALSS-2017 1006 | | 11:45 | Water | 7 | X | X | X | X | X | X | X | X | X |
| 5 | MONMN-2017 1006 | | 11:10 | Water | 7 | X | X | X | X | X | X | X | X | X |
| 6 | MONMS-2017 1006 | | 13:20 | Water | 7 | X | X | X | X | X | X | X | X | X |
| 7 | MONM-2017 1006 | | 14:20 | Water | 7 | X | X | X | X | X | X | X | X | X |
| 8 | SEIMN-2017 1006 | | 14:55 | Water | 7 | X | X | X | X | X | X | X | X | X |
| 9 | SEIMS-2017 1006 | | 13:45 | Water | 7 | X | X | X | X | X | X | X | X | X |
| 10 | TOSMI-2017 1006 | | 10:58 | Water | 7 | X | X | X | X | X | X | X | X | X |
| 11 | TOSMO-2017 1006 | | 10:15 | Water | 7 | X | X | X | X | X | X | X | X | X |
| 12 | TYLMI-2017 1006 | | 12:35 | Water | 7 | X | X | X | X | X | X | X | X | X |
| 13 | TYLMO-2017 1006 | | 12:50 | Water | 7 | X | X | X | X | X | X | X | X | X |
| 14 | QA 33-1006 | | 13:55 | Water | 7 | X | X | X | X | X | X | X | X | X |

Relinquished by Mammuth Date 10-6-17 Received by [Signature] Date 10/6/17

Firm Herrera Time 10:10 Firm OSE Time 1610

Relinquished by _____ Date _____ Received by _____ Date _____

Firm _____ Time _____ Firm _____ Time _____

Comments:
* - field filtered with 0.45 µm filter within 15 minutes of collecting sample



CHAIN OF CUSTODY

14648 NE 95th Street, Redmond, WA 98052
Telephone: 425.883.3881

Turnaround Requested:

1 Day

2 Day

3 Day

Standard

Laboratory No. 10-089

Requested Analyses

Company: Herrera Environmental Consultants
Project No.: 14-05806-000
Project Name: Redmond Paired Watershed Study
Project Manager: George Itner

| | | | | | | | | | | | | | | | | | | |
|-----------------------------------|-----------------------|---------------------------------|-------------------------------------|--------------------------|------------------------------|------------------------------|-----------------------------|-----------------------------------|--|--|--|--|--|--|--|--|--|--|
| Total Suspended Solids (SM 2540D) | Turbidity (EPA 181.1) | Hardness (EPA 200.7 / SM 2340B) | Dissolved Organ Carbon (SM 5310B) * | Fecal Coliform (SM 922D) | Total Phosphorus (EPA 365.1) | Total Nitrogen (SM 4500 N-B) | Total Cu and Zn (EPA 200.8) | Dissolved Cu and Zn (EPA 200.8) * | | | | | | | | | | |
|-----------------------------------|-----------------------|---------------------------------|-------------------------------------|--------------------------|------------------------------|------------------------------|-----------------------------|-----------------------------------|--|--|--|--|--|--|--|--|--|--|

| Lab ID | Sample Identification | Date Sampled | Time Sampled | Matrix | # of Cont. | Total Suspended Solids (SM 2540D) | Turbidity (EPA 181.1) | Hardness (EPA 200.7 / SM 2340B) | Dissolved Organ Carbon (SM 5310B) * | Fecal Coliform (SM 922D) | Total Phosphorus (EPA 365.1) | Total Nitrogen (SM 4500 N-B) | Total Cu and Zn (EPA 200.8) | Dissolved Cu and Zn (EPA 200.8) * | | | | |
|--------|----------------------------|--------------------|------------------|--------|------------|-----------------------------------|-----------------------|---------------------------------|-------------------------------------|--------------------------|------------------------------|------------------------------|-----------------------------|-----------------------------------|--|--|--|--|
| | COLM-2017 1006 | 10/6/17 | | Water | 7 | X | X | X | X | X | X | X | X | X | | | | |
| 1 | COUMI-2017 1006 | 10/6/17 | 9:35 | Water | 7 | X | X | X | X | X | X | X | X | X | | | | |
| 2 | COUMO-2017 1006 | | 16:35 | Water | 7 | X | X | X | X | X | X | X | X | X | | | | |
| 3 | EVAMS-2017 1006 | | 11:30 | Water | 7 | X | X | X | X | X | X | X | X | X | | | | |
| 4 | EVALSS-2017 1006 | | 11:45 | Water | 7 | X | X | X | X | X | X | X | X | X | | | | |
| 5 | MONMN-2017 1006 | | 11:10 | Water | 7 | X | X | X | X | X | X | X | X | X | | | | |
| 6 | MONMS-2017 1006 | | 13:20 | Water | 7 | X | X | X | X | X | X | X | X | X | | | | |
| 7 | MONM-2017 1006 | | 14:20 | Water | 7 | X | X | X | X | X | X | X | X | X | | | | |
| 8 | SEIMN-2017 1006 | | 14:55 | Water | 7 | X | X | X | X | X | X | X | X | X | | | | |
| 9 | SEIMS-2017 1006 | | 13:45 | Water | 7 | X | X | X | X | X | X | X | X | X | | | | |
| 10 | TOSMI-2017 1006 | | 10:56 | Water | 7 | X | X | X | X | X | X | X | X | X | | | | |
| 11 | TOSMO-2017 1006 | | 10:15 | Water | 7 | X | X | X | X | X | X | X | X | X | | | | |
| 12 | TYLMI-2017 1006 | | 12:35 | Water | 7 | X | X | X | X | X | X | X | X | X | | | | |
| 13 | TYLMO-2017 1006 | | 12:50 | Water | 7 | X | X | X | X | X | X | X | X | X | | | | |
| 14 | QA 1006 33-1006 | ✓ | 13:55 | Water | 7 | X | X | X | X | X | X | X | X | X | | | | |

Relinquished by [Signature] Date 10.6.17 Received by [Signature] Date 10/6/17

Firm Herrera Time 11:10 Firm O&E Time 1610

Relinquished by _____ Date _____ Received by _____ Date _____

Firm _____ Time _____ Firm _____ Time _____

Comments:
* - field filtered with 0.45 µm filter within 15 minutes of collecting sample

METER CALIBRATION LOG - Redmond Paired Watershed Study

| | | | |
|-----------------------------------|----------------|-------------|--|
| Project Number: | 14-05806-000 | | |
| Personnel Performing Calibration: | JM / BB | | |
| Meter: | YSI Pro DSS #1 | | |
| Date/Time: | 10.10.17 8:05 | | |
| Barometric Pressure Start of Day: | mmHg: — | Time: — | |
| Barometric Pressure End of Day: | mmHg: 705.0 | Time: 17:05 | |

Calibration Procedures:

Rinse Multimeter Sonde Between Each Operation

Rinse 3 times with tap water, 3 times with deionized water, then 3 times with the solution to be used for calibrating or testing.

Conductivity Calibration Notes:

1. Dry the conductivity probe with a lab tissue (e.g., KimWipes®) and DI water.
2. Fill calibration cup to within a centimeter of the top of the calibration cup with DI water (0 µS).
3. Fill the calibration cup with 1,000 µS standard so that the temperature/conductivity probe is submerged.
4. Make sure there are no bubbles in the cell; wait 2 minutes.
5. Enter the appropriate standard value (1,000 µS/cm or 1.0 mS/cm) for Sp Cond.
6. Check conductivity using 100 µS/cm standard.

Dissolved Oxygen Calibration Notes:

1. Fill the calibration cup with about 1/2 inch of DI; it should be below the sensor cap.
2. Use KimWipes® to dry any droplets from the sensor cap.
3. Invert calibration cup's cap and gently rest it on the cup.
4. Wait 5 minutes, making sure that temperature stabilizes.
5. Determine local barometric pressure (mm Hg) and enter this value into the meter.
6. Click "Calibrate". "Calibrate Successful" will be displayed.
7. To retain calibration accuracy between measurements, store with the sensor immersed in water or within a water-saturated air environment such as a sealed storage cup with at least 10 ml of water.
8. It is important to have the water-saturated air and the sensor at the same temperature. Therefore, store a jar of DI in the same environment as the sonde and calibrate in a similar air temperature as the water and sonde.
9. Keep probe out of direct sun or wind.



| PRE Field Run CALIBRATION | Meter Reading | Buffer / Cal Std | Temp °C | Comments |
|---------------------------|---------------|------------------|---------|----------|
| Conductivity (µS/cm) | 27.9 | 0 | 23.8 | |
| Conductivity (µS/cm) | 909 | 1,000 | 23.8 | |
| Conductivity (µS/cm) | 103.3 | 100 | 23.5 | |
| DO % Saturation | 98.5 | 100 | 23.2 | |
| POST Field Run CHECK | Meter Reading | Buffer / Cal Std | Temp °C | Comments |
| Conductivity (µS/cm) | 0.1 | 0 | 23.1 | |
| Conductivity (µS/cm) | 101.4 | 100 | 23.0 | |
| DO % Saturation | 99.0 | 100 | 22.4 | |

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

 Field Personnel: AB

 Sample Date: 10.16.17

 Sample Time: 14:30

 PDT

Base Flow or Storm Event?

 Field Filtered Time: —
 (Must filter within 15 minutes of collection)

PST

SITE ID:

COLM

 Project Number: 14-05806-000

 Project Name: Redmond Paired Watershed Study

HERRERA

 Current Weather and Temp: Sunny 8102°F

Water Quality Sampling

Sample ID:

| Parameter | Bottle Type | Bottle Volume | # Bottles | Preservative | Duplicated? |
|---------------------------|-------------|---------------|-----------|--------------------------------|-------------|
| TSS and Turbidity | HDPE | 1L | 1 | NA | |
| DOC * | HDPE | 250 ml | 1 | HCL | |
| Fecal Col. Bact. | HDPE | 250 ml | 1 | EDTA | |
| T. Phosphorous | HDPE | 250 ml | 1 | H ₂ SO ₄ | |
| T Nitrogen | HDPE | 250 ml | 1 | H ₂ SO ₄ | |
| Diss. Cu and Zn * | HDPE | 250 ml | 1 | HNO ₃ | |
| Hardness, Total Cu and Zn | HDPE | 500 ml | 1 | HNO ₃ | |

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID:

Filter blank sample ID:

Transfer blank sample ID:

Visual and Olfactory Conditions:

 Clarity: _____
 Color: _____
 Odor: _____
 Sheen: _____
 Floatables: _____

LABORATORY DELIVERY

Date:

Time:

Quality Assurance

 Checked By: S. Van Lenth

 Signature: [Signature]

 Date Checked: 10-15-17

Time:

Data Entered into Database?

 YES NO initials:

Date Entered:

Time:

Notes:

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

YSI Pro Plus (15D100020)
YSI Pro DSS 1
YSI Pro DSS 2

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): _____

Reference Point (description): _____

Water Quality Measurements

Temperature (°C) _____

Specific Conductivity (µs/cm) _____

Dissolved Oxygen (mg/L) _____

No water to sample/measure

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: BB, JM, AMH

Sample Date: 10/6/17

Sample Time: 09:35

PDT:

SITE

ID: COUM1-2017

Base Flow or Storm Event?

Field Filtered Time: 0940

PST:

Project Number: 14-05806-000

(Must filter within 15 minutes of collection)



HERRERA

Water Quality Sampling

Sample ID: COUM1-20171006

Project Name: Redmond Paired Watershed Study

Current Weather and Temp: cloudy 48°F

| Parameter | Bottle Type | Bottle Volume | # Bottles | Preservative | Duplicated? |
|---------------------------|-------------|---------------|-----------|--------------------------------|-------------|
| TSS and Turbidity | HDPE | 1L | 1 | NA | N/A |
| DOC * | HDPE | 250 ml | 1 | HCL | ↓ |
| Fecal Col. Bact. | HDPE | 250 ml | 1 | EDTA | |
| T. Phosphorous | HDPE | 250 ml | 1 | H ₂ SO ₄ | |
| T. Nitrogen | HDPE | 250 ml | 1 | H ₂ SO ₄ | |
| Diss. Cu and Zn * | HDPE | 250 ml | 1 | HNO ₃ | |
| Hardness, Total Cu and Zn | HDPE | 500 ml | 1 | HNO ₃ | |

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID: _____

Filter blank sample ID: _____

Transfer blank sample ID: _____

Visual and Olfactory Conditions:

Clarity: clear
 Color: None
 Odor: None
 Sheen: None
 Floatables: None

LABORATORY DELIVERY

Date: _____ Time: _____

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

YSI Pro Plus (15D100020) _____

YSI Pro DSS 1

YSI Pro DSS 2 _____

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): 2.67

Reference Point (description): gauge

Water Quality Measurements

Temperature (°C) 9.6

Specific Conductivity (µs/cm) 345.8

Dissolved Oxygen (mg/L) 11.03

Quality Assurance

Checked By: John Leuth Signature: _____

Date Checked: 11-15-17 Time: _____

Data Entered into Database? YES NO initials: _____

Date Entered: _____ Time: _____

Notes: _____

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: JM, AMH

Sample Date: 10/16/17

Sample Time: 10:35

PDT:

SITE

ID: COUMO

Base Flow or Storm Event? Base

Field Filtered Time: 10:40

PST

Project Number: 14-05806-000

(Must filter within 15 minutes of collection)



HERRERA

Project Name: Redmond Paired Watershed Study

Current Weather and Temp: Partly Sunny 58°F

Water Quality Sampling

Sample ID: COUMO20171606

| Parameter | Bottle Type | Bottle Volume | # Bottles | Preservative | Duplicated? |
|---------------------------|-------------|---------------|-----------|--------------------------------|-------------|
| TSS and Turbidity | HDPE | 1L | 1 | NA | N/A |
| DOC * | HDPE | 250 ml | 1 | HCL | ↓ |
| Fecal Col. Bact. | HDPE | 250 ml | 1 | EDTA | |
| T. Phosphorous | HDPE | 250 ml | 1 | H ₂ SO ₄ | |
| T. Nitrogen | HDPE | 250 ml | 1 | H ₂ SO ₄ | |
| Diss. Cu and Zn * | HDPE | 250 ml | 1 | HNO ₃ | |
| Hardness, Total Cu and Zn | HDPE | 500 ml | 1 | HNO ₃ | |

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID: _____

Filter blank sample ID: _____

Transfer blank sample ID: _____

Visual and Olfactory Conditions:

Clarity: clear
 Color: none
 Odor: none
 Sheen: none
 Floatables: none

LABORATORY DELIVERY

Date: _____ Time: _____

Quality Assurance

Checked By: John Lamb

Signature: [Signature]

Date Checked: 11-15-17 Time: _____

Data Entered into Database? YES NO initials: _____

Date Entered: _____ Time: _____

Notes: _____

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

YSI Pro Plus (15D100020) _____

YSI Pro DSS 1 _____

YSI Pro DSS 2 _____

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): 1.27

Reference Point (description): gauge

Water Quality Measurements

Temperature (°C) 10.6

Specific Conductivity (µs/cm) 318.2

Dissolved Oxygen (mg/L) 10.74

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: **BB, JM, AH**
 Sample Date: **10/16/17** Sample Time: **11:30** PDT:
 Base Flow or Storm Event? **base** Field Filtered Time: **11:35** PST:
(Must filter within 15 minutes of collection)

SITE ID: **EVAMS**
 Project Number: **14-05806-000**



Project Name: **Redmond Paired Watershed Study**

Current Weather and Temp: **Partially Sunny 56°F**

Water Quality Sampling

Sample ID: **EVAMS~~1006~~ 20171006**

| Parameter | Bottle Type | Bottle Volume | # Bottles | Preservative | Duplicated? |
|---------------------------|-------------|---------------|-----------|--------------------------------|-------------|
| TSS and Turbidity | HDPE | 1L | 1 | NA | N/A |
| DOC * | HDPE | 250 ml | 1 | HCL | ↓ |
| Fecal Col. Bact. | HDPE | 250 ml | 1 | EDTA | |
| T. Phosphorous | HDPE | 250 ml | 1 | H ₂ SO ₄ | |
| T. Nitrogen | HDPE | 250 ml | 1 | H ₂ SO ₄ | |
| Diss. Cu and Zn * | HDPE | 250 ml | 1 | HNO ₃ | |
| Hardness, Total Cu and Zn | HDPE | 500 ml | 1 | HNO ₃ | ↓ |

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID: _____
 Filter blank sample ID: _____
 Transfer blank sample ID: _____

Visual and Olfactory Conditions:

Clarity: **Clear**
 Color: **None**
 Odor: **None**
 Sheen: **None**
 Floatables: **None**

LABORATORY DELIVERY

Date: _____ Time: _____

Quality Assurance

Checked By: **Sandra Leath** Signature: *[Signature]*
 Date Checked: **10-15-17** Time: _____
 Data Entered into Database? YES NO initials:
 Date Entered: _____ Time: _____
 Notes: _____

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

YSI Pro Plus (15D100020) _____
 YSI Pro DSS 1 _____
 YSI Pro DSS 2 _____

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): **3.89**
 Reference Point (description): **gauge**

Water Quality Measurements

Temperature (°C) **10.1**
 Specific Conductivity (µs/cm) **231.0**
 Dissolved Oxygen (mg/L) **10.87**

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: AH, JM, BB

Sample Date: 10/16/17

Sample Time: 10:45

PDT: X

SITE ID: EVALSS

Base Flow or Storm Event? base

Field Filtered Time: 11:50

PST:

Project Number: 14-05806-000

(Must filter within 15 minutes of collection)



HERRERA

Project Name: Redmond Paired Watershed Study

Water Quality Sampling

Sample ID: EVALSS ~~1006~~ 2017-1006

Current Weather and Temp: Partial sun 61°F

| Parameter | Bottle Type | Bottle Volume | # Bottles | Preservative | Duplicated? |
|---------------------------|-------------|---------------|-----------|--------------------------------|-------------|
| TSS and Turbidity | HDPE | 1L | 1 | NA | <u>N/A</u> |
| DOC * | HDPE | 250 ml | 1 | HCL | ↓ |
| Fecal Col. Bact. | HDPE | 250 ml | 1 | EDTA | |
| T. Phosphorous | HDPE | 250 ml | 1 | H ₂ SO ₄ | |
| T. Nitrogen | HDPE | 250 ml | 1 | H ₂ SO ₄ | |
| Diss. Cu and Zn * | HDPE | 250 ml | 1 | HNO ₃ | |
| Hardness, Total Cu and Zn | HDPE | 500 ml | 1 | HNO ₃ | |

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID: _____

Filter blank sample ID: _____

Transfer blank sample ID: _____

Visual and Olfactory Conditions:

Clarity: clear
 Color: None
 Odor: None
 Sheen: None
 Floatables: None

LABORATORY DELIVERY

Date: _____ Time: _____

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

YSI Pro Plus (15D100020) _____

YSI Pro DSS 1 X _____

YSI Pro DSS 2 _____

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): 2.27

Reference Point (description): gauge

Water Quality Measurements

Temperature (°C) 10.0

Specific Conductivity (µs/cm) 212.2

Dissolved Oxygen (mg/L) 11.10

Quality Assurance

Checked By: John Louth

Signature: [Signature]

Date Checked: 11.15.17

Time: _____

Data Entered into Database? YES NO initials:

Date Entered: _____ Time: _____

Notes: _____

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: JM, AMH, BB

Sample Date: 10/6/17

Sample Time: 13:10

PDT:

SITE

ID: MONMN

Base Flow or Storm Event? Base

Field Filtered Time: 13:15

PST:

Project Number: 14-05806-000

(Must filter within 15 minutes of collection)



HERRERA

Project Name: Redmond Paired Watershed Study

Current Weather and Temp: partly cloudy, 62°F

Water Quality Sampling

Sample ID: MONMN-20171006

| Parameter | Bottle Type | Bottle Volume | # Bottles | Preservative | Duplicated? |
|---------------------------|-------------|---------------|-----------|--------------------------------|-------------|
| TSS and Turbidity | HDPE | 1L | 1 | NA | N/A |
| DOC * | HDPE | 250 ml | 1 | HCL | ↓ |
| Fecal Col. Bact. | HDPE | 250 ml | 1 | EDTA | |
| T. Phosphorous | HDPE | 250 ml | 1 | H ₂ SO ₄ | |
| T. Nitrogen | HDPE | 250 ml | 1 | H ₂ SO ₄ | |
| Diss. Cu and Zn * | HDPE | 250 ml | 1 | HNO ₃ | |
| Hardness, Total Cu and Zn | HDPE | 500 ml | 1 | HNO ₃ | |

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID: _____
 Filter blank sample ID: _____
 Transfer blank sample ID: _____

Visual and Olfactory Conditions:

Clarity: clear
 Color: none
 Odor: none
 Sheen: none
 Floatables: none

LABORATORY DELIVERY

Date: _____ Time: _____

Quality Assurance

Checked By: Sarah Lenth Signature: [Signature]
 Date Checked: 11-15-17 Time: _____
 Data Entered into Database? YES NO initials:
 Date Entered: _____ Time: _____
 Notes: _____

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

YSI Pro Plus (15D100020) _____
 YSI Pro DSS 1 _____
 YSI Pro DSS 2 _____

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): gauge 8.98
 Reference Point (description): 0.98 SG

Water Quality Measurements

Temperature (°C) 11.1
 Specific Conductivity (µs/cm) 213.2
 Dissolved Oxygen (mg/L) 9.70

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: JM, AMH

Sample Date: 10/6/17

Sample Time: 13:20

PDT: X

SITE

ID: MONMS

Base Flow or Storm Event? Base

Field Filtered Time: 13:25

PST:

Project Number: 14-05806-000

(Must filter within 15 minutes of collection)



HERRERA

Project Name: Redmond Paired Watershed Study

Water Quality Sampling

Sample ID: MONMS-20171006

Current Weather and Temp: mostly sunny, 62°F

| Parameter | Bottle Type | Bottle Volume | # Bottles | Preservative | Duplicated? |
|---------------------------|-------------|---------------|-----------|--------------------------------|-------------|
| TSS and Turbidity | HDPE | 1L | 1 | NA | N/A |
| DOC * | HDPE | 250 ml | 1 | HCL | ↓ |
| Fecal Col. Bact. | HDPE | 250 ml | 1 | EDTA | |
| T. Phosphorous | HDPE | 250 ml | 1 | H ₂ SO ₄ | |
| T. Nitrogen | HDPE | 250 ml | 1 | H ₂ SO ₄ | |
| Diss. Cu and Zn * | HDPE | 250 ml | 1 | HNO ₃ | |
| Hardness, Total Cu and Zn | HDPE | 500 ml | 1 | HNO ₃ | ↓ |

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID: _____
 Filter blank sample ID: _____
 Transfer blank sample ID: _____

Visual and Olfactory Conditions:

Clarity: clear
 Color: none
 Odor: none
 Sheen: none
 Floatables: none

LABORATORY DELIVERY

Date: _____ Time: _____

Quality Assurance

Checked By: John Lenth Signature: _____
 Date Checked: 11-65-17 Time: _____
 Data Entered into Database? YES NO initials: _____
 Date Entered: _____ Time: _____
 Notes: _____

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

YSI Pro Plus (15D100020) _____

YSI Pro DSS 1 X _____

YSI Pro DSS 2 _____

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): Vault

Reference Point (description): 6.86'

Water Quality Measurements

Temperature (°C) 10.6

Specific Conductivity (µs/cm) 407.6

Dissolved Oxygen (mg/L) 8.90

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: JM, AMH, BB

Sample Date: 10/6/17

Sample Time: 14:20

PDT:

SITE ID: MONM

Base Flow or Storm Event? Base

Field Filtered Time: 14:25

PST:

Project Number: 14-05806-000

(Must filter within 15 minutes of collection)



HERRERA

Project Name: Redmond Paired Watershed Study

Current Weather and Temp: cloudy 62°F

Water Quality Sampling

Sample ID: MONM-20171006

| Parameter | Bottle Type | Bottle Volume | # Bottles | Preservative | Duplicated? |
|---------------------------|-------------|---------------|-----------|--------------------------------|-------------|
| TSS and Turbidity | HDPE | 1L | 1 | NA | N/A |
| DOC * | HDPE | 250 ml | 1 | HCL | ↓ |
| Fecal Col. Bact. | HDPE | 250 ml | 1 | EDTA | |
| T. Phosphorous | HDPE | 250 ml | 1 | H ₂ SO ₄ | |
| T. Nitrogen | HDPE | 250 ml | 1 | H ₂ SO ₄ | |
| Diss. Cu and Zn * | HDPE | 250 ml | 1 | HNO ₃ | |
| Hardness, Total Cu and Zn | HDPE | 500 ml | 1 | HNO ₃ | |

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID: _____
 Filter blank sample ID: _____
 Transfer blank sample ID: _____

Visual and Olfactory Conditions:

Clarity: clear
 Color: none
 Odor: none
 Sheen: none
 Floatables: none

LABORATORY DELIVERY

Date: _____ Time: _____

Quality Assurance

Checked By: Solva Lenth Signature: [Signature]
 Date Checked: 11-15-17 Time: _____
 Data Entered into Database? YES NO initials:
 Date Entered: _____ Time: _____
 Notes: _____

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

YSI Pro Plus (15D100020) _____
 YSI Pro DSS 1 _____
 YSI Pro DSS 2 _____

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): N/A
 Reference Point (description): N/A

Water Quality Measurements

Temperature (°C) 9.9
 Specific Conductivity (µs/cm) 252.7
 Dissolved Oxygen (mg/L) 10.80

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: JM, AMH

Sample Date: 10/6/17

Sample Time: 14:50

PDT:

SITE ID: SEIMN

Base Flow or Storm Event? Base

Field Filtered Time: 14:55

PST:

Project Number: 14-05806-000

(Must filter within 15 minutes of collection)



HERRERA

Project Name: Redmond Paired Watershed Study

Current Weather and Temp: Cloudy, 62°F

Water Quality Sampling

Sample ID: SEIMN-20171006

| Parameter | Bottle Type | Bottle Volume | # Bottles | Preservative | Duplicated? |
|---------------------------|-------------|---------------|-----------|--------------------------------|-------------|
| TSS and Turbidity | HDPE | 1L | 1 | NA | N/A |
| DOC * | HDPE | 250 ml | 1 | HCL | ↓ |
| Fecal Col. Bact. | HDPE | 250 ml | 1 | EDTA | |
| T. Phosphorous | HDPE | 250 ml | 1 | H ₂ SO ₄ | |
| T. Nitrogen | HDPE | 250 ml | 1 | H ₂ SO ₄ | |
| Diss. Cu and Zn * | HDPE | 250 ml | 1 | HNO ₃ | |
| Hardness, Total Cu and Zn | HDPE | 500 ml | 1 | HNO ₃ | ↓ |

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID: _____

Filter blank sample ID: _____

Transfer blank sample ID: _____

Visual and Olfactory Conditions:

Clarity: clear
 Color: light brown
 Odor: none
 Sheen: none
 Floatables: none

LABORATORY DELIVERY

Date: _____ Time: _____

Quality Assurance

Checked By: Solun Lenth Signature: _____

Date Checked: 11-15-17 Time: _____

Data Entered into Database? YES NO initials: _____

Date Entered: _____ Time: _____

Notes: _____

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

YSI Pro Plus (15D100020) _____

YSI Pro DSS 1 _____

YSI Pro DSS 2 _____

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): 0.83'

Reference Point (description): bottom of bank to top of water surface

Water Quality Measurements

Temperature (°C) 10.6

Specific Conductivity (µs/cm) 123.3

Dissolved Oxygen (mg/L) 10.71

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: BB, AA, JM

Sample Date: 10/16/17

Sample Time: 1345

PDT

SITE ID: SEIMS

Base Flow or Storm Event? base

Field Filtered Time: 1350

PST

Project Number: 14-05806-000

(Must filter within 15 minutes of collection)



HERRERA

Project Name: Redmond Paired Watershed Study

Water Quality Sampling

Sample ID: SEIMS-20171006

Current Weather and Temp: Partly Sunny 61°F

| Parameter | Bottle Type | Bottle Volume | # Bottles | Preservative | Duplicated? |
|---------------------------|-------------|---------------|-----------|--------------------------------|-------------|
| TSS and Turbidity | HDPE | 1L | 1 | NA | <u>yes</u> |
| DOC * | HDPE | 250 ml | 1 | HCL | ↓ |
| Fecal Col. Bact. | HDPE | 250 ml | 1 | EDTA | |
| T. Phosphorous | HDPE | 250 ml | 1 | H ₂ SO ₄ | |
| T. Nitrogen | HDPE | 250 ml | 1 | H ₂ SO ₄ | |
| Diss. Cu and Zn * | HDPE | 250 ml | 1 | HNO ₃ | |
| Hardness, Total Cu and Zn | HDPE | 500 ml | 1 | HNO ₃ | ↓ |

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID: QA33-20171006

Filter blank sample ID: N/A

Transfer blank sample ID: N/A

Visual and Olfactory Conditions:

Clarity: clear
 Color: none
 Odor: none
 Sheen: none
 Floatables: none

LABORATORY DELIVERY

Date: _____ Time: _____

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

YSI Pro Plus (15D100020) _____

YSI Pro DSS 1

YSI Pro DSS 2 _____

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): 0.72

Reference Point (description): gauge

Water Quality Measurements

Temperature (°C) 10.4

Specific Conductivity (µs/cm) 127.8

Dissolved Oxygen (mg/L) 10.57

Quality Assurance

Checked By: J. L. Barth

Signature: _____

Date Checked: 11-15-17

Time: _____

Data Entered into Database? YES NO initials: _____

Date Entered: _____ Time: _____

Notes: _____

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: BK, AMH, JM
 Sample Date: 10/10/17 Sample Time: 10:56 PDT:
 Base Flow or Storm Event? base Field Filtered Time: 10:59 PST:
(Must filter within 15 minutes of collection)

SITE ID: TOSM1
 Project Number: 14-05806-000



Project Name: Redmond Paired Watershed Study

Current Weather and Temp: _____

Water Quality Sampling

Sample ID: TOSM1²⁰¹⁷1006

| Parameter | Bottle Type | Bottle Volume | # Bottles | Preservative | Duplicated? |
|---------------------------|-------------|---------------|-----------|--------------------------------|-------------|
| TSS and Turbidity | HDPE | 1L | 1 | NA | N/A |
| DOC * | HDPE | 250 ml | 1 | HCL | ↓ |
| Fecal Col. Bact. | HDPE | 250 ml | 1 | EDTA | |
| T. Phosphorous | HDPE | 250 ml | 1 | H ₂ SO ₄ | |
| T. Nitrogen | HDPE | 250 ml | 1 | H ₂ SO ₄ | |
| Diss. Cu and Zn * | HDPE | 250 ml | 1 | HNO ₃ | |
| Hardness, Total Cu and Zn | HDPE | 500 ml | 1 | HNO ₃ | |

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID: _____
 Filter blank sample ID: _____
 Transfer blank sample ID: _____

Visual and Olfactory Conditions:

Clarity: Clear
 Color: None
 Odor: None
 Sheen: None
 Floatables: None

LABORATORY DELIVERY

Date: _____ Time: _____

Quality Assurance

Checked By: John Lentz Signature: [Signature]
 Date Checked: 11-15-17 Time: _____
 Data Entered into Database? YES NO initials:
 Date Entered: _____ Time: _____
 Notes: _____

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

YSI Pro Plus (15D100020) _____
 YSI Pro DSS 1 _____
 YSI Pro DSS 2 _____

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): N/A see comment
 Reference Point (description): gauge

Water Quality Measurements

Temperature (°C) 10.8
 Specific Conductivity (µs/cm) 326.9
 Dissolved Oxygen (mg/L) 10.66

Water levels too low to get a reading at the staff gauge

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: JM, AH

Sample Date: 10/6/17

Sample Time: 10:15

PDT:

SITE ID: TDSMO

Base Flow or Storm Event? Base

Field Filtered Time: 10:28

PST:

Project Number: 14-05806-000

(Must filter within 15 minutes of collection)



HERRERA

Project Name: Redmond Paired Watershed Study

Water Quality Sampling

Sample ID: TDSMO-20171006

| Parameter | Bottle Type | Bottle Volume | # Bottles | Preservative | Duplicated? |
|---------------------------|-------------|---------------|-----------|--------------------------------|-------------|
| TSS and Turbidity | HDPE | 1L | 1 | NA | N/A |
| DOC * | HDPE | 250 ml | 1 | HCL | ↓ |
| Fecal Col. Bact. | HDPE | 250 ml | 1 | EDTA | |
| T. Phosphorous | HDPE | 250 ml | 1 | H ₂ SO ₄ | |
| T. Nitrogen | HDPE | 250 ml | 1 | H ₂ SO ₄ | |
| Diss. Cu and Zn * | HDPE | 250 ml | 1 | HNO ₃ | |
| Hardness, Total Cu and Zn | HDPE | 500 ml | 1 | HNO ₃ | |

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID: _____
 Filter blank sample ID: _____
 Transfer blank sample ID: _____

Visual and Olfactory Conditions:

Clarity: Clear
 Color: None
 Odor: None
 Sheen: None
 Floatables: None

LABORATORY DELIVERY

Date: _____ Time: _____

Quality Assurance

Checked By: John Lenth Signature: _____
 Date Checked: 10-15-17 Time: _____
 Data Entered into Database? YES NO initials:
 Date Entered: _____ Time: _____
 Notes: _____

Current Weather and Temp: Partly Sunny 56°F

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

YSI Pro Plus (15D100020) _____
 YSI Pro DSS 1 _____
 YSI Pro DSS 2 _____

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): 0.53
 Reference Point (description): gauge

Water Quality Measurements

Temperature (°C) 9.4
 Specific Conductivity (µs/cm) 276.7
 Dissolved Oxygen (mg/L) 11.26

Cleared sediment from stuff gauge in order to get a reading

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: JM, AMH

Sample Date: 10/6/17

Sample Time: 12:35

PDT:

SITE ID: TYLMI

Base Flow or Storm Event? Base

Field Filtered Time: 12:40

PST:

Project Number: 14-05806-000

(Must filter within 15 minutes of collection)



HERRERA

Project Name: Redmond Paired Watershed Study

Current Weather and Temp: mostly cloudy 61°

Water Quality Sampling

Sample ID: TYLMI-20171006

| Parameter | Bottle Type | Bottle Volume | # Bottles | Preservative | Duplicated? |
|---------------------------|-------------|---------------|-----------|--------------------------------|-------------|
| TSS and Turbidity | HDPE | 1L | 1 | NA | N/A |
| DOC * | HDPE | 250 ml | 1 | HCL | ↓ |
| Fecal Col. Bact. | HDPE | 250 ml | 1 | EDTA | |
| T. Phosphorous | HDPE | 250 ml | 1 | H ₂ SO ₄ | |
| T. Nitrogen | HDPE | 250 ml | 1 | H ₂ SO ₄ | |
| Diss. Cu and Zn * | HDPE | 250 ml | 1 | HNO ₃ | |
| Hardness, Total Cu and Zn | HDPE | 500 ml | 1 | HNO ₃ | |

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID: _____
 Filter blank sample ID: _____
 Transfer blank sample ID: _____

Visual and Olfactory Conditions:

Clarity: clear
 Color: none
 Odor: none
 Sheen: none
 Floatables: none

LABORATORY DELIVERY

Date: _____ Time: _____

Quality Assurance

Checked By: John Lamb Signature: _____
 Date Checked: 10-15-17 Time: _____
 Data Entered into Database? YES NO initials:
 Date Entered: _____ Time: _____
 Notes: _____

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

YSI Pro Plus (15D100020) _____
 YSI Pro DSS 1 _____
 YSI Pro DSS 2 _____

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): 55.32"

Reference Point (description): ~~at~~ top of culvert to water surface

Water Quality Measurements

Temperature (°C) 12.1
 Specific Conductivity (µs/cm) 247.1
 Dissolved Oxygen (mg/L) 16.13

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: JM AH 12/18

Sample Date: 10.6.17

Sample Time: 12:50

PDT:

SITE ID: TYLMO

Base Flow or Storm Event?

Field Filtered Time: 12:55

PST:

Project Number: 14-05806-000

(Must filter within 15 minutes of collection)



HERRERA

Water Quality Sampling

Sample ID: TYLMO-20171006

Project Name: Redmond Paired Watershed Study

Current Weather and Temp: Partly cloudy, 60°F

| Parameter | Bottle Type | Bottle Volume | # Bottles | Preservative | Duplicated? |
|---------------------------|-------------|---------------|-----------|--------------------------------|-------------|
| TSS and Turbidity | HDPE | 1L | 1 | NA | N |
| DOC * | HDPE | 250 ml | 1 | HCL | ↓ |
| Fecal Col. Bact. | HDPE | 250 ml | 1 | EDTA | |
| T. Phosphorous | HDPE | 250 ml | 1 | H ₂ SO ₄ | |
| T. Nitrogen | HDPE | 250 ml | 1 | H ₂ SO ₄ | |
| Diss. Cu and Zn * | HDPE | 250 ml | 1 | HNO ₃ | |
| Hardness, Total Cu and Zn | HDPE | 500 ml | 1 | HNO ₃ | |

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID: _____
 Filter blank sample ID: _____
 Transfer blank sample ID: _____

Visual and Olfactory Conditions:

Clarity: clear
 Color: none
 Odor: ↓
 Sheen: ↓
 Floatables: susp. sed

LABORATORY DELIVERY

Date: _____ Time: _____

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

YSI Pro Plus (15D100020) _____
 YSI Pro DSS 1 _____
 YSI Pro DSS 2 _____

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): 35.50"
 Reference Point (description): top of culvert L

Water Quality Measurements

Temperature (°C) 9.8
 Specific Conductivity (µs/cm) 221.4
 Dissolved Oxygen (mg/L) 10.95

Quality Assurance

Checked By: John Lenth Signature: _____
 Date Checked: 11.15.17 Time: _____
 Data Entered into Database? YES NO initials:
 Date Entered: _____ Time: _____
 Notes: _____



Data Quality Assurance Worksheet

Project Name/No./Client: Redmond Paired Watershed Study / 14-05806-000 / City of Redmond

Laboratory/Parameters: OnSite Environmental : TSS, turbidity, hardness, DOC, TP, Dissolved & Total Cu, Zn / AmTest: Total nitrogen, fecal coliform bacteria

Sample Date/Sample ID: 10/06/2017 / All sites, 1 FD (QA33) at SEIMS

By G. Catarra

Date 11/13/2017 Page 1 of 2

Checked: initials JL

date 11/17/17

| Parameter | Completeness/ Methodology | Pre-preservation Holding Times (minutes) | | Total Holding Times (days) | | Method Blanks Reporting Limit | Matrix Spikes/ Surrogate Recovery (%) | | Lab Control Samples Recovery (%) | | Lab Duplicates RPD (%) | | Field Duplicates RPD (%) | | Instrument Calibration/ Performance | ACTION |
|-------------------------------------|------------------------------|--|------|-------------------------------|------|--|---|-------------------|--|-------------------|---------------------------|-------------------|-----------------------------|-------------------|---|---|
| | | Reported | Goal | Reported | Goal | | Reported | Goal ¹ | Reported | Goal ¹ | Reported | Goal ¹ | Reported | Goal ¹ | | |
| TSS | OK / SM 2540D | NA | NA | 4 | ≤7 | ≤1.0 mg/L 1.0 mg/L | NA | NA | 94 | ±20 | 5 | ≤25 | D=1.4 | ≤25 | OK | NONE |
| Turbidity | OK / EPA 180.1 | NA | NA | <1 | ≤2 | ≤0.1 NTU 0.1 NTU | NA | NA | NA | ±10 | 0 | ≤25 | 21 | ≤25 | OK | NONE |
| Hardness | OK / SM 2340B | NA | NA | 7,10 | ≤180 | ≤1.0 mg/L 1.0 mg/L | 102,94 | ±25 | 102 | ±15 | 0 | ≤20 | 3.9 | ≤20 | OK | NONE |
| DOC | OK / SM 5310B | <15 | ≤15 | 6 | ≤28 | ≤1.0 mg/L 1.0 mg/L | 102 | ±25 | 110 | ±15 | 4 | ≤20 | D=0.2 | ≤20 | OK | NONE |
| Total Phosphorus | OK / EPA 365.1 | NA | NA | 4 | ≤28 | ≤0.01 mg/L 0.01 mg/L | 103 | ±25 | 99 | ±20 | 7 | ≤20 | D=0.001 | ≤20 | OK | NONE |
| Total Nitrogen (TKN + N+N) | OK/ SM 4500 N-B | NA | NA | 4,13 | ≤28 | ≤0.1 mg/L 0.1 mg/L | 98,97 | ±25 | 99-100 | ±20 | 8.4,8.0 | ≤20 | D=0.029, 74 | ≤20 | OK | FLAG N+N DATA FOR SEIMS DUE TO FD RPD. |

¹ If the sample or duplicate value is less than five times the reporting limit, the difference is calculated rather than the relative percent difference (RPD). The QA goal is a difference <2 times the detection limit instead of the number indicated in the goal column.

NA – not applicable or not available; NC – not calculable due to one or more values below the detection limit; NS – field duplicate not sampled.



Data Quality Assurance Worksheet

By G. Catarra

Project Name/No./Client: Redmond Paired Watershed Study / 14-05806-000 / City of Redmond

Date 11/13/2017 Page 2 of 2

Laboratory/Parameters: OnSite Environmental : TSS, turbidity, hardness, DOC, TP, Dissolved & Total Cu, Zn / AmTest: total nitrogen, fecal coliform bacteria

Checked: initials JL

Sample Date/Sample ID: 10/06/2017 / All sites, 1 FD (QA33) at SEIMS

date 11/17/17

| Parameter | Completeness/ Methodology | Pre-preservation Holding Times (minutes) | | Total Holding Times (days) | | Method Blanks Reporting Limit | Matrix Spikes/ Surrogate Recovery (%) | | Lab Control Samples Recovery (%) | | Lab Duplicates RPD (%) | | Field Duplicates RPD (%) | | Instrument Calibration/ Performance | ACTION |
|---------------------|------------------------------|--|------|-------------------------------|------|---|---|-------------------|--|------|---------------------------|-------------------|-----------------------------|-------------------|---|-----------------------------------|
| | | Reported | Goal | Reported | Goal | | Reported | Goal ¹ | Reported | Goal | Reported | Goal ¹ | Reported | Goal ¹ | | |
| Total Copper | OK/ EPA 200.8 | NA | NA | 10 | ≤180 | ≤1.0 µg/L 1.0 µg/L | 95,96 | ±25 | NR | ±15 | NC | ≤20 | NC | ≤20 | OK | NONE |
| Total Zinc | OK/ EPA 200.8 | NA | NA | 10 | ≤180 | ≤5.0 µg/L 5.0 µg/L | 99,101 | ±25 | NR | ±15 | NC | ≤20 | NC | ≤20 | OK | NONE |
| Dissolved Copper | OK/ EPA 200.8 | <15 | ≤15 | 7 | ≤180 | ≤1.0 µg/L 1.0 µg/L | 87,88 | ±25 | NR | ±15 | NC | ≤20 | NC | ≤20 | OK | NONE |
| Dissolved Zinc | OK/ EPA 200.8 | <15 | ≤15 | 7 | ≤180 | ≤5.0 µg/L 5.0 µg/L | 92,93 | ±25 | NR | ±15 | 6 | ≤20 | NC | ≤20 | OK | NONE |
| Fecal Coliform | OK / SM 9222D | NA | NA | <1 | ≤1 | ≤1.0 cfu/ 100mL 1.0 cfu/ 100mL | NA | NA | NA | NA | 38 | ≤35 | NC | ≤50 | OK | FLAG COUMI DUE TO LAB DUP RPD. |

¹ If the sample or duplicate value is less than five times the reporting limit, the difference is calculated rather than the relative percent difference (RPD). The QA goal is a difference <2 times the detection limit instead of the number indicated in the goal column.

NA – not applicable or not available; NC – not calculable due to one or more values below the detection limit; NS – field duplicate not sampled.



14648 NE 95th Street, Redmond, WA 98052 • (425) 883-3881

November 1, 2017

George Iftner
Herrera Environmental Consultants, Inc.
2200 6th Avenue, Suite 1100
Seattle, WA 98121

Re: Analytical Data for Project 14-05806-000
Laboratory Reference No. 1710-249

Dear George:

Enclosed are the analytical results and associated quality control data for samples submitted on October 19, 2017.

The standard policy of OnSite Environmental, Inc. is to store your samples for 30 days from the date of receipt. If you require longer storage, please contact the laboratory.

We appreciate the opportunity to be of service to you on this project. If you have any questions concerning the data, or need additional information, please feel free to call me.

Sincerely,

A handwritten signature in black ink, appearing to read "Blair Goodrow", enclosed within a large, loopy circular flourish.

Blair Goodrow
Project Manager

Enclosures



OnSite Environmental, Inc. 14648 NE 95th Street, Redmond, WA 98052 (425) 883-3881

This report pertains to the samples analyzed in accordance with the chain of custody, and is intended only for the use of the individual or company to whom it is addressed.

Date of Report: November 1, 2017
Samples Submitted: October 19, 2017
Laboratory Reference: 1710-249
Project: 14-05806-000

Case Narrative

Samples were collected on October 18, 2017 and received by the laboratory on October 19, 2017. They were maintained at the laboratory at a temperature of 2°C to 6°C.

Please note that any and all soil sample results are reported on a dry-weight basis, unless otherwise noted below.

General QA/QC issues associated with the analytical data enclosed in this laboratory report will be indicated with a reference to a comment or explanation on the Data Qualifier page. More complex and involved QA/QC issues will be discussed in detail below.



Date of Report: November 1, 2017
 Samples Submitted: October 19, 2017
 Laboratory Reference: 1710-249
 Project: 14-05806-000

**TOTAL SUSPENDED SOLIDS
SM 2540D**

Matrix: Water
 Units: mg/L

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|------------------------|----------------------|-----|----------|---------------|---------------|-------|
| Client ID: | COLM-20171018 | | | | | |
| Laboratory ID: | 10-249-01 | | | | | |
| Total Suspended Solids | ND | 1.0 | SM 2540D | 10-23-17 | 10-24-17 | |

| | | | | | | |
|------------------------|-----------------------|-----|----------|----------|----------|--|
| Client ID: | COUMI-20171018 | | | | | |
| Laboratory ID: | 10-249-02 | | | | | |
| Total Suspended Solids | 140 | 2.5 | SM 2540D | 10-23-17 | 10-24-17 | |

| | | | | | | |
|------------------------|-----------------------|-----|----------|----------|----------|--|
| Client ID: | COUMO-20171018 | | | | | |
| Laboratory ID: | 10-249-03 | | | | | |
| Total Suspended Solids | 68 | 1.7 | SM 2540D | 10-23-17 | 10-24-17 | |

| | | | | | | |
|------------------------|-----------------------|-----|----------|----------|----------|--|
| Client ID: | EVAMS-20171018 | | | | | |
| Laboratory ID: | 10-249-04 | | | | | |
| Total Suspended Solids | 34 | 1.0 | SM 2540D | 10-23-17 | 10-24-17 | |

| | | | | | | |
|------------------------|------------------------|-----|----------|----------|----------|--|
| Client ID: | EVALSS-20171018 | | | | | |
| Laboratory ID: | 10-249-05 | | | | | |
| Total Suspended Solids | 37 | 1.0 | SM 2540D | 10-23-17 | 10-24-17 | |

| | | | | | | |
|------------------------|-----------------------|-----|----------|----------|----------|--|
| Client ID: | MONMN-20171018 | | | | | |
| Laboratory ID: | 10-249-06 | | | | | |
| Total Suspended Solids | 71 | 1.7 | SM 2540D | 10-23-17 | 10-24-17 | |

| | | | | | | |
|------------------------|-----------------------|-----|----------|----------|----------|--|
| Client ID: | MONMS-20171018 | | | | | |
| Laboratory ID: | 10-249-07 | | | | | |
| Total Suspended Solids | 5.0 | 1.0 | SM 2540D | 10-23-17 | 10-24-17 | |



Date of Report: November 1, 2017
 Samples Submitted: October 19, 2017
 Laboratory Reference: 1710-249
 Project: 14-05806-000

**TOTAL SUSPENDED SOLIDS
 SM 2540D**

Matrix: Water
 Units: mg/L

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|------------------------|----------------------|-----|----------|---------------|---------------|-------|
| Client ID: | MONM-20171018 | | | | | |
| Laboratory ID: | 10-249-08 | | | | | |
| Total Suspended Solids | 51 | 1.7 | SM 2540D | 10-23-17 | 10-24-17 | |

| | | | | | | |
|------------------------|-----------------------|-----|----------|----------|----------|--|
| Client ID: | SEIMN-20171018 | | | | | |
| Laboratory ID: | 10-249-09 | | | | | |
| Total Suspended Solids | 79 | 1.7 | SM 2540D | 10-23-17 | 10-24-17 | |

| | | | | | | |
|------------------------|-----------------------|-----|----------|----------|----------|--|
| Client ID: | SEIMS-20171018 | | | | | |
| Laboratory ID: | 10-249-10 | | | | | |
| Total Suspended Solids | 26 | 1.0 | SM 2540D | 10-23-17 | 10-24-17 | |

| | | | | | | |
|------------------------|-----------------------|-----|----------|----------|----------|--|
| Client ID: | TOSMI-20171018 | | | | | |
| Laboratory ID: | 10-249-11 | | | | | |
| Total Suspended Solids | 320 | 2.5 | SM 2540D | 10-23-17 | 10-24-17 | |

| | | | | | | |
|------------------------|-----------------------|-----|----------|----------|----------|--|
| Client ID: | TOSMO-20171018 | | | | | |
| Laboratory ID: | 10-249-12 | | | | | |
| Total Suspended Solids | 180 | 2.5 | SM 2540D | 10-23-17 | 10-24-17 | |

| | | | | | | |
|------------------------|-----------------------|-----|----------|----------|----------|--|
| Client ID: | TYLMI-20171018 | | | | | |
| Laboratory ID: | 10-249-13 | | | | | |
| Total Suspended Solids | 47 | 1.0 | SM 2540D | 10-23-17 | 10-24-17 | |

| | | | | | | |
|------------------------|-----------------------|-----|----------|----------|----------|--|
| Client ID: | TYLMO-20171018 | | | | | |
| Laboratory ID: | 10-249-14 | | | | | |
| Total Suspended Solids | 16 | 1.0 | SM 2540D | 10-23-17 | 10-24-17 | |



Date of Report: November 1, 2017
Samples Submitted: October 19, 2017
Laboratory Reference: 1710-249
Project: 14-05806-000

**TOTAL SUSPENDED SOLIDS
SM 2540D**

Matrix: Water
Units: mg/L

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|------------------------|----------------------|------------|---------------|----------------------|----------------------|--------------|
| Client ID: | QA34-20171018 | | | | | |
| Laboratory ID: | 10-249-15 | | | | | |
| Total Suspended Solids | 140 | 2.5 | SM 2540D | 10-23-17 | 10-24-17 | |



Date of Report: November 1, 2017
 Samples Submitted: October 19, 2017
 Laboratory Reference: 1710-249
 Project: 14-05806-000

**TOTAL SUSPENDED SOLIDS
 SM 2540D
 QUALITY CONTROL**

Matrix: Water
 Units: mg/L

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|------------------------|-----------|-----|----------|---------------|---------------|-------|
| METHOD BLANK | | | | | | |
| Laboratory ID: | MB1023W1 | | | | | |
| Total Suspended Solids | ND | 1.0 | SM 2540D | 10-23-17 | 10-24-17 | |

| Analyte | Result | Spike Level | Source Result | Percent Recovery | Recovery Limits | RPD | RPD Limit | Flags |
|------------------------|-------------|-------------|---------------|------------------|-----------------|-----|-----------|-------|
| DUPLICATE | | | | | | | | |
| Laboratory ID: | 10-249-14 | | | | | | | |
| | ORIG | DUP | | | | | | |
| Total Suspended Solids | 15.8 | 16.2 | NA | NA | NA | 2 | 17 | |

SPIKE BLANK

| | | | | | | | | |
|------------------------|-------------|-----|----|----|--------|----|----|--|
| Laboratory ID: | SB1023W1 | | | | | | | |
| | SB | SB | | SB | | | | |
| Total Suspended Solids | 91.0 | 100 | NA | 91 | 76-114 | NA | NA | |



Date of Report: November 1, 2017
 Samples Submitted: October 19, 2017
 Laboratory Reference: 1710-249
 Project: 14-05806-000

TURBIDITY
EPA 180.1

Matrix: Water
 Units: NTU

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|-------------------|------------------------|------|-----------|---------------|---------------|-------|
| Client ID: | COLM-20171018 | | | | | |
| Laboratory ID: | 10-249-01 | | | | | |
| Turbidity | 0.57 | 0.10 | EPA 180.1 | 10-20-17 | 10-20-17 | |
| Client ID: | COUMI-20171018 | | | | | |
| Laboratory ID: | 10-249-02 | | | | | |
| Turbidity | 51 | 0.10 | EPA 180.1 | 10-20-17 | 10-20-17 | |
| Client ID: | COUMO-20171018 | | | | | |
| Laboratory ID: | 10-249-03 | | | | | |
| Turbidity | 34 | 0.10 | EPA 180.1 | 10-20-17 | 10-20-17 | |
| Client ID: | EVAMS-20171018 | | | | | |
| Laboratory ID: | 10-249-04 | | | | | |
| Turbidity | 14 | 0.10 | EPA 180.1 | 10-20-17 | 10-20-17 | |
| Client ID: | EVALSS-20171018 | | | | | |
| Laboratory ID: | 10-249-05 | | | | | |
| Turbidity | 16 | 0.10 | EPA 180.1 | 10-20-17 | 10-20-17 | |
| Client ID: | MONMN-20171018 | | | | | |
| Laboratory ID: | 10-249-06 | | | | | |
| Turbidity | 18 | 0.10 | EPA 180.1 | 10-20-17 | 10-20-17 | |
| Client ID: | MONMS-20171018 | | | | | |
| Laboratory ID: | 10-249-07 | | | | | |
| Turbidity | 3.8 | 0.10 | EPA 180.1 | 10-20-17 | 10-20-17 | |



Date of Report: November 1, 2017
 Samples Submitted: October 19, 2017
 Laboratory Reference: 1710-249
 Project: 14-05806-000

TURBIDITY
EPA 180.1

Matrix: Water
 Units: NTU

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|-------------------|----------------------|------|-----------|---------------|---------------|-------|
| Client ID: | MONM-20171018 | | | | | |
| Laboratory ID: | 10-249-08 | | | | | |
| Turbidity | 15 | 0.10 | EPA 180.1 | 10-20-17 | 10-20-17 | |

| | | | | | | |
|-------------------|-----------------------|------|-----------|----------|----------|--|
| Client ID: | SEIMN-20171018 | | | | | |
| Laboratory ID: | 10-249-09 | | | | | |
| Turbidity | 31 | 0.10 | EPA 180.1 | 10-20-17 | 10-20-17 | |

| | | | | | | |
|-------------------|-----------------------|------|-----------|----------|----------|--|
| Client ID: | SEIMS-20171018 | | | | | |
| Laboratory ID: | 10-249-10 | | | | | |
| Turbidity | 12 | 0.10 | EPA 180.1 | 10-20-17 | 10-20-17 | |

| | | | | | | |
|-------------------|-----------------------|------|-----------|----------|----------|--|
| Client ID: | TOSMI-20171018 | | | | | |
| Laboratory ID: | 10-249-11 | | | | | |
| Turbidity | 73 | 0.10 | EPA 180.1 | 10-20-17 | 10-20-17 | |

| | | | | | | |
|-------------------|-----------------------|------|-----------|----------|----------|--|
| Client ID: | TOSMO-20171018 | | | | | |
| Laboratory ID: | 10-249-12 | | | | | |
| Turbidity | 52 | 0.10 | EPA 180.1 | 10-20-17 | 10-20-17 | |

| | | | | | | |
|-------------------|-----------------------|------|-----------|----------|----------|--|
| Client ID: | TYLMI-20171018 | | | | | |
| Laboratory ID: | 10-249-13 | | | | | |
| Turbidity | 18 | 0.10 | EPA 180.1 | 10-20-17 | 10-20-17 | |

| | | | | | | |
|-------------------|-----------------------|------|-----------|----------|----------|--|
| Client ID: | TYLMO-20171018 | | | | | |
| Laboratory ID: | 10-249-14 | | | | | |
| Turbidity | 8.2 | 0.10 | EPA 180.1 | 10-20-17 | 10-20-17 | |



Date of Report: November 1, 2017
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TURBIDITY
EPA 180.1

Matrix: Water
Units: NTU

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|-------------------|----------------------|------------|---------------|----------------------|----------------------|--------------|
| Client ID: | QA34-20171018 | | | | | |
| Laboratory ID: | 10-249-15 | | | | | |
| Turbidity | 67 | 0.10 | EPA 180.1 | 10-20-17 | 10-20-17 | |



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**TURBIDITY
 EPA 180.1
 QUALITY CONTROL**

Matrix: Water
 Units: NTU

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|---------------------|-----------|------|-----------|---------------|---------------|-------|
| METHOD BLANK | | | | | | |
| Laboratory ID: | MB1020W1 | | | | | |
| Turbidity | ND | 0.10 | EPA 180.1 | 10-20-17 | 10-20-17 | |

| Analyte | Result | Spike Level | Source Result | Percent Recovery | Recovery Limits | RPD | RPD Limit | Flags |
|------------------|--------------|--------------|---------------|------------------|-----------------|-----|-----------|-------|
| DUPLICATE | | | | | | | | |
| Laboratory ID: | 10-249-01 | | | | | | | |
| | ORIG | DUP | | | | | | |
| Turbidity | 0.570 | 0.580 | NA | NA | NA | NA | 2 | 15 |



Date of Report: November 1, 2017
 Samples Submitted: October 19, 2017
 Laboratory Reference: 1710-249
 Project: 14-05806-000

HARDNESS
EPA 200.7/SM 2340B

Matrix: Water
 Units: mg eqt. CaCO₃/L (ppm)

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|-------------------|----------------------|-----|----------------|---------------|---------------|-------|
| Client ID: | COLM-20171018 | | | | | |
| Laboratory ID: | 10-249-01 | | | | | |
| Hardness | 11 | 1.0 | 200.7/SM 2340B | 10-20-17 | 10-23-17 | |

| | | | | | | |
|-------------------|-----------------------|-----|----------------|----------|----------|--|
| Client ID: | COUMI-20171018 | | | | | |
| Laboratory ID: | 10-249-02 | | | | | |
| Hardness | 64 | 1.0 | 200.7/SM 2340B | 10-20-17 | 10-23-17 | |

| | | | | | | |
|-------------------|-----------------------|-----|----------------|----------|----------|--|
| Client ID: | COUMO-20171018 | | | | | |
| Laboratory ID: | 10-249-03 | | | | | |
| Hardness | 35 | 1.0 | 200.7/SM 2340B | 10-20-17 | 10-23-17 | |

| | | | | | | |
|-------------------|-----------------------|-----|----------------|----------|----------|--|
| Client ID: | EVAMS-20171018 | | | | | |
| Laboratory ID: | 10-249-04 | | | | | |
| Hardness | 86 | 1.0 | 200.7/SM 2340B | 10-20-17 | 10-23-17 | |

| | | | | | | |
|-------------------|------------------------|-----|----------------|----------|----------|--|
| Client ID: | EVALSS-20171018 | | | | | |
| Laboratory ID: | 10-249-05 | | | | | |
| Hardness | 76 | 1.0 | 200.7/SM 2340B | 10-20-17 | 10-23-17 | |

| | | | | | | |
|-------------------|-----------------------|-----|----------------|----------|----------|--|
| Client ID: | MONMN-20171018 | | | | | |
| Laboratory ID: | 10-249-06 | | | | | |
| Hardness | 44 | 1.0 | 200.7/SM 2340B | 10-20-17 | 10-23-17 | |

| | | | | | | |
|-------------------|-----------------------|-----|----------------|----------|----------|--|
| Client ID: | MONMS-20171018 | | | | | |
| Laboratory ID: | 10-249-07 | | | | | |
| Hardness | 56 | 1.0 | 200.7/SM 2340B | 10-20-17 | 10-23-17 | |



Date of Report: November 1, 2017
 Samples Submitted: October 19, 2017
 Laboratory Reference: 1710-249
 Project: 14-05806-000

HARDNESS
EPA 200.7/SM 2340B

Matrix: Water
 Units: mg eqt. CaCO₃/L (ppm)

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|-------------------|----------------------|-----|----------------|---------------|---------------|-------|
| Client ID: | MONM-20171018 | | | | | |
| Laboratory ID: | 10-249-08 | | | | | |
| Hardness | 58 | 1.0 | 200.7/SM 2340B | 10-20-17 | 10-23-17 | |

| | | | | | | |
|-------------------|-----------------------|-----|----------------|----------|----------|--|
| Client ID: | SEIMN-20171018 | | | | | |
| Laboratory ID: | 10-249-09 | | | | | |
| Hardness | 38 | 1.0 | 200.7/SM 2340B | 10-20-17 | 10-23-17 | |

| | | | | | | |
|-------------------|-----------------------|-----|----------------|----------|----------|--|
| Client ID: | SEIMS-20171018 | | | | | |
| Laboratory ID: | 10-249-10 | | | | | |
| Hardness | 45 | 1.0 | 200.7/SM 2340B | 10-20-17 | 10-23-17 | |

| | | | | | | |
|-------------------|-----------------------|-----|----------------|----------|----------|--|
| Client ID: | TOSMI-20171018 | | | | | |
| Laboratory ID: | 10-249-11 | | | | | |
| Hardness | 31 | 1.0 | 200.7/SM 2340B | 10-20-17 | 10-23-17 | |

| | | | | | | |
|-------------------|-----------------------|-----|----------------|----------|----------|--|
| Client ID: | TOSMO-20171018 | | | | | |
| Laboratory ID: | 10-249-12 | | | | | |
| Hardness | 45 | 1.0 | 200.7/SM 2340B | 10-20-17 | 10-23-17 | |

| | | | | | | |
|-------------------|-----------------------|-----|----------------|----------|----------|--|
| Client ID: | TYLMI-20171018 | | | | | |
| Laboratory ID: | 10-249-13 | | | | | |
| Hardness | 53 | 1.0 | 200.7/SM 2340B | 10-20-17 | 10-23-17 | |

| | | | | | | |
|-------------------|-----------------------|-----|----------------|----------|----------|--|
| Client ID: | TYLMO-20171018 | | | | | |
| Laboratory ID: | 10-249-14 | | | | | |
| Hardness | 28 | 1.0 | 200.7/SM 2340B | 10-20-17 | 10-23-17 | |



Date of Report: November 1, 2017
Samples Submitted: October 19, 2017
Laboratory Reference: 1710-249
Project: 14-05806-000

HARDNESS
EPA 200.7/SM 2340B

Matrix: Water
Units: mg eqt. CaCO₃/L (ppm)

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|-------------------|----------------------|------------|----------------|----------------------|----------------------|--------------|
| Client ID: | QA34-20171018 | | | | | |
| Laboratory ID: | 10-249-15 | | | | | |
| Hardness | 63 | 1.0 | 200.7/SM 2340B | 10-20-17 | 10-23-17 | |



Date of Report: November 1, 2017
 Samples Submitted: October 19, 2017
 Laboratory Reference: 1710-249
 Project: 14-05806-000

**HARDNESS
 EPA 200.7/SM 2340B
 QUALITY CONTROL**

Matrix: Water
 Units: mg eqt. CaCO₃/L (ppm)

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|---------------------|-----------|-----|----------------|---------------|---------------|-------|
| METHOD BLANK | | | | | | |
| Laboratory ID: | MB1020WH4 | | | | | |
| Hardness | ND | 1.0 | 200.7/SM 2340B | 10-20-17 | 10-23-17 | |

| Analyte | Result | Spike Level | Source Result | Percent Recovery | Recovery Limits | RPD | RPD Limit | Flags |
|------------------|-------------|-------------|---------------|------------------|-----------------|-----|-----------|-------|
| DUPLICATE | | | | | | | | |
| Laboratory ID: | 10-249-01 | | | | | | | |
| | ORIG | DUP | | | | | | |
| Hardness | 11.5 | 12.2 | NA | NA | NA | NA | 6 | 20 |

| Analyte | Result | Spike Level | Source Result | Percent Recovery | Recovery Limits | RPD | RPD Limit | Flags | | |
|----------------------|------------|-------------|---------------|------------------|-----------------|-----|-----------|--------|---|----|
| MATRIX SPIKES | | | | | | | | | | |
| Laboratory ID: | 10-249-01 | | | | | | | | | |
| | MS | MSD | MS | MSD | MS | MSD | | | | |
| Hardness | 141 | 147 | 132 | 132 | 11.5 | 98 | 103 | 75-125 | 4 | 20 |

| Analyte | Result | Spike Level | Source Result | Percent Recovery | Recovery Limits | RPD | RPD Limit | Flags |
|--------------------|------------|-------------|---------------|------------------|-----------------|-----|-----------|-------|
| SPIKE BLANK | | | | | | | | |
| Laboratory ID: | SB1020WH4 | | | | | | | |
| | SB | SB | | | SB | | | |
| Hardness | 132 | 132 | NA | 100 | 80-120 | NA | NA | |



Date of Report: November 1, 2017
 Samples Submitted: October 19, 2017
 Laboratory Reference: 1710-249
 Project: 14-05806-000

**DISSOLVED ORGANIC CARBON
 SM 5310B**

Matrix: Water
 Units: mg/L

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|--------------------------|------------------------|-----|----------|---------------|---------------|-------|
| Client ID: | COLM-20171018 | | | | | |
| Laboratory ID: | 10-249-01 | | | | | |
| Dissolved Organic Carbon | 9.1 | 1.0 | SM 5310B | 10-25-17 | 10-25-17 | |
| Client ID: | COUMI-20171018 | | | | | |
| Laboratory ID: | 10-249-02 | | | | | |
| Dissolved Organic Carbon | 12 | 1.0 | SM 5310B | 10-25-17 | 10-25-17 | |
| Client ID: | COUMO-20171018 | | | | | |
| Laboratory ID: | 10-249-03 | | | | | |
| Dissolved Organic Carbon | 9.4 | 1.0 | SM 5310B | 10-25-17 | 10-25-17 | |
| Client ID: | EVAMS-20171018 | | | | | |
| Laboratory ID: | 10-249-04 | | | | | |
| Dissolved Organic Carbon | 5.8 | 1.0 | SM 5310B | 10-25-17 | 10-25-17 | |
| Client ID: | EVALSS-20171018 | | | | | |
| Laboratory ID: | 10-249-05 | | | | | |
| Dissolved Organic Carbon | 5.0 | 1.0 | SM 5310B | 10-25-17 | 10-25-17 | |
| Client ID: | MONMN-20171018 | | | | | |
| Laboratory ID: | 10-249-06 | | | | | |
| Dissolved Organic Carbon | 10 | 1.0 | SM 5310B | 10-25-17 | 10-25-17 | |
| Client ID: | MONMS-20171018 | | | | | |
| Laboratory ID: | 10-249-07 | | | | | |
| Dissolved Organic Carbon | 7.3 | 1.0 | SM 5310B | 10-25-17 | 10-25-17 | |



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**DISSOLVED ORGANIC CARBON
 SM 5310B**

Matrix: Water
 Units: mg/L

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|--------------------------|-----------------------|-----|----------|---------------|---------------|-------|
| Client ID: | MONM-20171018 | | | | | |
| Laboratory ID: | 10-249-08 | | | | | |
| Dissolved Organic Carbon | 10 | 1.0 | SM 5310B | 10-25-17 | 10-25-17 | |
| Client ID: | SEIMN-20171018 | | | | | |
| Laboratory ID: | 10-249-09 | | | | | |
| Dissolved Organic Carbon | 7.5 | 1.0 | SM 5310B | 10-25-17 | 10-25-17 | |
| Client ID: | SEIMS-20171018 | | | | | |
| Laboratory ID: | 10-249-10 | | | | | |
| Dissolved Organic Carbon | 15 | 1.0 | SM 5310B | 10-25-17 | 10-25-17 | |
| Client ID: | TOSMI-20171018 | | | | | |
| Laboratory ID: | 10-249-11 | | | | | |
| Dissolved Organic Carbon | 8.9 | 1.0 | SM 5310B | 10-25-17 | 10-25-17 | |
| Client ID: | TOSMO-20171018 | | | | | |
| Laboratory ID: | 10-249-12 | | | | | |
| Dissolved Organic Carbon | 10 | 1.0 | SM 5310B | 10-25-17 | 10-25-17 | |
| Client ID: | TYLMI-20171018 | | | | | |
| Laboratory ID: | 10-249-13 | | | | | |
| Dissolved Organic Carbon | 5.2 | 1.0 | SM 5310B | 10-25-17 | 10-25-17 | |
| Client ID: | TYLMO-20171018 | | | | | |
| Laboratory ID: | 10-249-14 | | | | | |
| Dissolved Organic Carbon | 6.1 | 1.0 | SM 5310B | 10-25-17 | 10-25-17 | |



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**DISSOLVED ORGANIC CARBON
SM 5310B**

Matrix: Water
Units: mg/L

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|--------------------------|----------------------|------------|---------------|----------------------|----------------------|--------------|
| Client ID: | QA34-20171018 | | | | | |
| Laboratory ID: | 10-249-15 | | | | | |
| Dissolved Organic Carbon | 13 | 1.0 | SM 5310B | 10-25-17 | 10-25-17 | |



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**DISSOLVED ORGANIC CARBON
 SM 5310B
 QUALITY CONTROL**

Matrix: Water
 Units: mg/L

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|--------------------------|-----------|-----|----------|---------------|---------------|-------|
| METHOD BLANK | | | | | | |
| Laboratory ID: | MB1025D1 | | | | | |
| Dissolved Organic Carbon | ND | 1.0 | SM 5310B | 10-25-17 | 10-25-17 | |

| Analyte | Result | Spike Level | Source Result | Percent Recovery | Recovery Limits | RPD | RPD Limit | Flags |
|--------------------------|-------------|-------------|---------------|------------------|-----------------|-----|-----------|-------|
| DUPLICATE | | | | | | | | |
| Laboratory ID: | 10-249-01 | | | | | | | |
| | ORIG | DUP | | | | | | |
| Dissolved Organic Carbon | 9.10 | 8.84 | NA | NA | NA | 3 | 15 | |

MATRIX SPIKE

| | | | | | | | | |
|--------------------------|-------------|------|------|----|--------|----|----|--|
| Laboratory ID: | 10-249-01 | | | | | | | |
| | MS | MS | | MS | | | | |
| Dissolved Organic Carbon | 17.9 | 10.0 | 9.10 | 88 | 75-125 | NA | NA | |

SPIKE BLANK

| | | | | | | | | |
|--------------------------|-------------|------|----|-----|--------|----|----|--|
| Laboratory ID: | SB1025D1 | | | | | | | |
| | SB | SB | | SB | | | | |
| Dissolved Organic Carbon | 10.7 | 10.0 | NA | 107 | 80-120 | NA | NA | |



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TOTAL PHOSPHORUS
EPA 365.1

Matrix: Water
 Units: mg/L

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|-------------------|----------------------|-------|-----------|---------------|---------------|-------|
| Client ID: | COLM-20171018 | | | | | |
| Laboratory ID: | 10-249-01 | | | | | |
| Total Phosphorus | 0.017 | 0.010 | EPA 365.1 | 10-24-17 | 10-24-17 | |

| | | | | | | |
|-------------------|-----------------------|-------|-----------|----------|----------|--|
| Client ID: | COUMI-20171018 | | | | | |
| Laboratory ID: | 10-249-02 | | | | | |
| Total Phosphorus | 0.32 | 0.010 | EPA 365.1 | 10-24-17 | 10-24-17 | |

| | | | | | | |
|-------------------|-----------------------|-------|-----------|----------|----------|--|
| Client ID: | COUMO-20171018 | | | | | |
| Laboratory ID: | 10-249-03 | | | | | |
| Total Phosphorus | 0.17 | 0.010 | EPA 365.1 | 10-24-17 | 10-24-17 | |

| | | | | | | |
|-------------------|-----------------------|-------|-----------|----------|----------|--|
| Client ID: | EVAMS-20171018 | | | | | |
| Laboratory ID: | 10-249-04 | | | | | |
| Total Phosphorus | 0.050 | 0.010 | EPA 365.1 | 10-24-17 | 10-24-17 | |

| | | | | | | |
|-------------------|------------------------|-------|-----------|----------|----------|--|
| Client ID: | EVALSS-20171018 | | | | | |
| Laboratory ID: | 10-249-05 | | | | | |
| Total Phosphorus | 0.068 | 0.010 | EPA 365.1 | 10-24-17 | 10-24-17 | |

| | | | | | | |
|-------------------|-----------------------|-------|-----------|----------|----------|--|
| Client ID: | MONMN-20171018 | | | | | |
| Laboratory ID: | 10-249-06 | | | | | |
| Total Phosphorus | 0.19 | 0.010 | EPA 365.1 | 10-24-17 | 10-24-17 | |

| | | | | | | |
|-------------------|-----------------------|-------|-----------|----------|----------|--|
| Client ID: | MONMS-20171018 | | | | | |
| Laboratory ID: | 10-249-07 | | | | | |
| Total Phosphorus | 0.058 | 0.010 | EPA 365.1 | 10-24-17 | 10-24-17 | |



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 Project: 14-05806-000

TOTAL PHOSPHORUS
EPA 365.1

Matrix: Water
 Units: mg/L

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|-------------------|----------------------|-------|-----------|---------------|---------------|-------|
| Client ID: | MONM-20171018 | | | | | |
| Laboratory ID: | 10-249-08 | | | | | |
| Total Phosphorus | 0.12 | 0.010 | EPA 365.1 | 10-24-17 | 10-24-17 | |

| | | | | | | |
|-------------------|-----------------------|-------|-----------|----------|----------|--|
| Client ID: | SEIMN-20171018 | | | | | |
| Laboratory ID: | 10-249-09 | | | | | |
| Total Phosphorus | 0.19 | 0.010 | EPA 365.1 | 10-24-17 | 10-24-17 | |

| | | | | | | |
|-------------------|-----------------------|-------|-----------|----------|----------|--|
| Client ID: | SEIMS-20171018 | | | | | |
| Laboratory ID: | 10-249-10 | | | | | |
| Total Phosphorus | 0.066 | 0.010 | EPA 365.1 | 10-24-17 | 10-24-17 | |

| | | | | | | |
|-------------------|-----------------------|-------|-----------|----------|----------|--|
| Client ID: | TOSMI-20171018 | | | | | |
| Laboratory ID: | 10-249-11 | | | | | |
| Total Phosphorus | 0.43 | 0.010 | EPA 365.1 | 10-24-17 | 10-24-17 | |

| | | | | | | |
|-------------------|-----------------------|-------|-----------|----------|----------|--|
| Client ID: | TOSMO-20171018 | | | | | |
| Laboratory ID: | 10-249-12 | | | | | |
| Total Phosphorus | 0.24 | 0.010 | EPA 365.1 | 10-24-17 | 10-24-17 | |

| | | | | | | |
|-------------------|-----------------------|-------|-----------|----------|----------|--|
| Client ID: | TYLMI-20171018 | | | | | |
| Laboratory ID: | 10-249-13 | | | | | |
| Total Phosphorus | 0.094 | 0.010 | EPA 365.1 | 10-24-17 | 10-24-17 | |

| | | | | | | |
|-------------------|-----------------------|-------|-----------|----------|----------|--|
| Client ID: | TYLMO-20171018 | | | | | |
| Laboratory ID: | 10-249-14 | | | | | |
| Total Phosphorus | 0.074 | 0.010 | EPA 365.1 | 10-24-17 | 10-24-17 | |



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TOTAL PHOSPHORUS
EPA 365.1

Matrix: Water
Units: mg/L

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|-------------------|----------------------|------------|---------------|----------------------|----------------------|--------------|
| Client ID: | QA34-20171018 | | | | | |
| Laboratory ID: | 10-249-15 | | | | | |
| Total Phosphorus | 0.34 | 0.010 | EPA 365.1 | 10-24-17 | 10-24-17 | |



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**TOTAL PHOSPHORUS
 EPA 365.1
 QUALITY CONTROL**

Matrix: Water
 Units: mg/L

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|---------------------|-----------|-------|-----------|---------------|---------------|-------|
| METHOD BLANK | | | | | | |
| Laboratory ID: | MB1024W1 | | | | | |
| Total Phosphorus | ND | 0.010 | EPA 365.1 | 10-24-17 | 10-24-17 | |

| Analyte | Result | Spike Level | Source Result | Percent Recovery | Recovery Limits | RPD | RPD Limit | Flags |
|------------------|---------------|---------------|---------------|------------------|-----------------|-----|-----------|-------|
| DUPLICATE | | | | | | | | |
| Laboratory ID: | 10-249-01 | | | | | | | |
| | ORIG | DUP | | | | | | |
| Total Phosphorus | 0.0172 | 0.0161 | NA | NA | NA | NA | 7 | 11 |

| | | | | | | | | |
|---------------------|--------------|-------|--------|----|--------|----|----|--|
| MATRIX SPIKE | | | | | | | | |
| Laboratory ID: | 10-249-01 | | | | | | | |
| | MS | MS | | MS | | | | |
| Total Phosphorus | 0.263 | 0.250 | 0.0172 | 98 | 82-124 | NA | NA | |

| | | | | | | | | |
|--------------------|--------------|-------|----|----|--------|----|----|--|
| SPIKE BLANK | | | | | | | | |
| Laboratory ID: | SB1024W1 | | | | | | | |
| | SB | SB | | SB | | | | |
| Total Phosphorus | 0.225 | 0.250 | NA | 90 | 87-114 | NA | NA | |



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**TOTAL METALS
 EPA 200.8**

Matrix: Water
 Units: ug/L (ppb)

| Analyte | Result | PQL | EPA Method | Date Prepared | Date Analyzed | Flags |
|-----------------------------------|--------|-----|------------|---------------|---------------|-------|
| Lab ID: 10-249-01 | | | | | | |
| Client ID: COLM-20171018 | | | | | | |
| Copper | ND | 1.0 | 200.8 | 10-20-17 | 10-24-17 | |
| Zinc | ND | 5.0 | 200.8 | 10-20-17 | 10-24-17 | |
| Lab ID: 10-249-02 | | | | | | |
| Client ID: COUMI-20171018 | | | | | | |
| Copper | 8.8 | 1.0 | 200.8 | 10-20-17 | 10-24-17 | |
| Zinc | 42 | 5.0 | 200.8 | 10-20-17 | 10-24-17 | |
| Lab ID: 10-249-03 | | | | | | |
| Client ID: COUMO-20171018 | | | | | | |
| Copper | 8.2 | 1.0 | 200.8 | 10-20-17 | 10-24-17 | |
| Zinc | 110 | 5.0 | 200.8 | 10-20-17 | 10-24-17 | |
| Lab ID: 10-249-04 | | | | | | |
| Client ID: EVAMS-20171018 | | | | | | |
| Copper | 3.7 | 1.0 | 200.8 | 10-20-17 | 10-24-17 | |
| Zinc | 5.8 | 5.0 | 200.8 | 10-20-17 | 10-24-17 | |
| Lab ID: 10-249-05 | | | | | | |
| Client ID: EVALSS-20171018 | | | | | | |
| Copper | 1.5 | 1.0 | 200.8 | 10-20-17 | 10-24-17 | |
| Zinc | 5.0 | 5.0 | 200.8 | 10-20-17 | 10-24-17 | |
| Lab ID: 10-249-06 | | | | | | |
| Client ID: MONMN-20171018 | | | | | | |
| Copper | 2.5 | 1.0 | 200.8 | 10-20-17 | 10-24-17 | |
| Zinc | 29 | 5.0 | 200.8 | 10-20-17 | 10-24-17 | |



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TOTAL METALS
EPA 200.8

Matrix: Water
 Units: ug/L (ppb)

| Analyte | Result | PQL | EPA Method | Date Prepared | Date Analyzed | Flags |
|-------------------|-----------------------|-----|------------|---------------|---------------|-------|
| Lab ID: | 10-249-07 | | | | | |
| Client ID: | MONMS-20171018 | | | | | |
| Copper | 2.6 | 1.0 | 200.8 | 10-20-17 | 10-24-17 | |
| Zinc | ND | 5.0 | 200.8 | 10-20-17 | 10-24-17 | |
| Lab ID: | 10-249-08 | | | | | |
| Client ID: | MONM-20171018 | | | | | |
| Copper | 2.9 | 1.0 | 200.8 | 10-20-17 | 10-24-17 | |
| Zinc | 34 | 5.0 | 200.8 | 10-20-17 | 10-24-17 | |
| Lab ID: | 10-249-09 | | | | | |
| Client ID: | SEIMN-20171018 | | | | | |
| Copper | 2.5 | 1.0 | 200.8 | 10-20-17 | 10-24-17 | |
| Zinc | ND | 5.0 | 200.8 | 10-20-17 | 10-24-17 | |
| Lab ID: | 10-249-10 | | | | | |
| Client ID: | SEIMS-20171018 | | | | | |
| Copper | ND | 1.0 | 200.8 | 10-20-17 | 10-24-17 | |
| Zinc | ND | 5.0 | 200.8 | 10-20-17 | 10-24-17 | |
| Lab ID: | 10-249-11 | | | | | |
| Client ID: | TOSMI-20171018 | | | | | |
| Copper | 16 | 1.0 | 200.8 | 10-20-17 | 10-24-17 | |
| Zinc | 120 | 5.0 | 200.8 | 10-20-17 | 10-24-17 | |
| Lab ID: | 10-249-12 | | | | | |
| Client ID: | TOSMO-20171018 | | | | | |
| Copper | 11 | 1.0 | 200.8 | 10-20-17 | 10-24-17 | |
| Zinc | 92 | 5.0 | 200.8 | 10-20-17 | 10-24-17 | |



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TOTAL METALS
EPA 200.8

Matrix: Water
 Units: ug/L (ppb)

| Analyte | Result | PQL | EPA Method | Date Prepared | Date Analyzed | Flags |
|-------------------|-----------------------|------------|-------------------|----------------------|----------------------|--------------|
| Lab ID: | 10-249-13 | | | | | |
| Client ID: | TYLMI-20171018 | | | | | |
| Copper | 11 | 1.0 | 200.8 | 10-20-17 | 10-24-17 | |
| Zinc | 37 | 5.0 | 200.8 | 10-20-17 | 10-24-17 | |

| | | | | | | |
|-------------------|-----------------------|-----|-------|----------|----------|--|
| Lab ID: | 10-249-14 | | | | | |
| Client ID: | TYLMO-20171018 | | | | | |
| Copper | 5.4 | 1.0 | 200.8 | 10-20-17 | 10-24-17 | |
| Zinc | 16 | 5.0 | 200.8 | 10-20-17 | 10-24-17 | |

| | | | | | | |
|-------------------|----------------------|-----|-------|----------|----------|--|
| Lab ID: | 10-249-15 | | | | | |
| Client ID: | QA34-20171018 | | | | | |
| Copper | 8.4 | 1.0 | 200.8 | 10-20-17 | 10-24-17 | |
| Zinc | 39 | 5.0 | 200.8 | 10-20-17 | 10-24-17 | |



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TOTAL METALS
EPA 200.8
METHOD BLANK QUALITY CONTROL

Date Extracted: 10-20-17
Date Analyzed: 10-24-17

Matrix: Water
Units: ug/L (ppb)

Lab ID: MB1020WH2

| Analyte | Method | Result | PQL |
|---------|--------|-----------|-----|
| Copper | 200.8 | ND | 1.0 |
| Zinc | 200.8 | ND | 5.0 |



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**TOTAL METALS
 EPA 200.8
 DUPLICATE QUALITY CONTROL**

Date Extracted: 10-20-17

Date Analyzed: 10-24-17

Matrix: Water

Units: ug/L (ppb)

Lab ID: 10-249-07

| Analyte | Sample Result | Duplicate Result | RPD | PQL | Flags |
|---------|---------------|------------------|-----|-----|-------|
| Copper | 2.60 | 2.56 | 2 | 1.0 | |
| Zinc | ND | ND | NA | 5.0 | |



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**TOTAL METALS
 EPA 200.8
 MS/MSD QUALITY CONTROL**

Date Extracted: 10-20-17

Date Analyzed: 10-24-17

Matrix: Water

Units: ug/L (ppb)

Lab ID: 10-249-07

| Analyte | Spike Level | MS | Percent Recovery | MSD | Percent Recovery | RPD | Flags |
|---------|-------------|-------------|------------------|-------------|------------------|-----|-------|
| Copper | 100 | 94.4 | 92 | 96.6 | 94 | 2 | |
| Zinc | 100 | 108 | 108 | 111 | 111 | 3 | |



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**DISSOLVED METALS
 EPA 200.8**

Matrix: Water
 Units: ug/L (ppb)

| Analyte | Result | PQL | EPA Method | Date Prepared | Date Analyzed | Flags |
|-----------------------------------|---------------|------------|-------------------|----------------------|----------------------|--------------|
| Lab ID: 10-249-01 | | | | | | |
| Client ID: COLM-20171018 | | | | | | |
| Copper | ND | 1.0 | 200.8 | | 10-19-17 | |
| Zinc | ND | 5.0 | 200.8 | | 10-19-17 | |
| Lab ID: 10-249-02 | | | | | | |
| Client ID: COUMI-20171018 | | | | | | |
| Copper | 3.0 | 1.0 | 200.8 | | 10-19-17 | |
| Zinc | 7.4 | 5.0 | 200.8 | | 10-19-17 | |
| Lab ID: 10-249-03 | | | | | | |
| Client ID: COUMO-20171018 | | | | | | |
| Copper | 3.1 | 1.0 | 200.8 | | 10-19-17 | |
| Zinc | 52 | 5.0 | 200.8 | | 10-19-17 | |
| Lab ID: 10-249-04 | | | | | | |
| Client ID: EVAMS-20171018 | | | | | | |
| Copper | ND | 1.0 | 200.8 | | 10-19-17 | |
| Zinc | ND | 5.0 | 200.8 | | 10-19-17 | |
| Lab ID: 10-249-05 | | | | | | |
| Client ID: EVALSS-20171018 | | | | | | |
| Copper | ND | 1.0 | 200.8 | | 10-19-17 | |
| Zinc | ND | 5.0 | 200.8 | | 10-19-17 | |
| Lab ID: 10-249-06 | | | | | | |
| Client ID: MONMN-20171018 | | | | | | |
| Copper | ND | 1.0 | 200.8 | | 10-19-17 | |
| Zinc | 6.3 | 5.0 | 200.8 | | 10-19-17 | |



OnSite Environmental, Inc. 14648 NE 95th Street, Redmond, WA 98052 (425) 883-3881

This report pertains to the samples analyzed in accordance with the chain of custody, and is intended only for the use of the individual or company to whom it is addressed.

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DISSOLVED METALS
EPA 200.8

Matrix: Water
 Units: ug/L (ppb)

| Analyte | Result | PQL | EPA Method | Date Prepared | Date Analyzed | Flags |
|-------------------|-----------------------|------------|-------------------|----------------------|----------------------|--------------|
| Lab ID: | 10-249-07 | | | | | |
| Client ID: | MONMS-20171018 | | | | | |
| Copper | 2.0 | 1.0 | 200.8 | | 10-19-17 | |
| Zinc | ND | 5.0 | 200.8 | | 10-19-17 | |
| Lab ID: | 10-249-08 | | | | | |
| Client ID: | MONM-20171018 | | | | | |
| Copper | 1.4 | 1.0 | 200.8 | | 10-19-17 | |
| Zinc | 11 | 5.0 | 200.8 | | 10-19-17 | |
| Lab ID: | 10-249-09 | | | | | |
| Client ID: | SEIMN-20171018 | | | | | |
| Copper | ND | 1.0 | 200.8 | | 10-19-17 | |
| Zinc | ND | 5.0 | 200.8 | | 10-19-17 | |
| Lab ID: | 10-249-10 | | | | | |
| Client ID: | SEIMS-20171018 | | | | | |
| Copper | ND | 1.0 | 200.8 | | 10-19-17 | |
| Zinc | ND | 5.0 | 200.8 | | 10-19-17 | |
| Lab ID: | 10-249-11 | | | | | |
| Client ID: | TOSMI-20171018 | | | | | |
| Copper | 3.3 | 1.0 | 200.8 | | 10-19-17 | |
| Zinc | 17 | 5.0 | 200.8 | | 10-19-17 | |
| Lab ID: | 10-249-12 | | | | | |
| Client ID: | TOSMO-20171018 | | | | | |
| Copper | 3.0 | 1.0 | 200.8 | | 10-19-17 | |
| Zinc | 11 | 5.0 | 200.8 | | 10-19-17 | |



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DISSOLVED METALS
EPA 200.8

Matrix: Water
 Units: ug/L (ppb)

| Analyte | Result | PQL | EPA Method | Date Prepared | Date Analyzed | Flags |
|-------------------|-----------------------|------------|-------------------|----------------------|----------------------|--------------|
| Lab ID: | 10-249-13 | | | | | |
| Client ID: | TYLMI-20171018 | | | | | |
| Copper | 4.4 | 1.0 | 200.8 | | 10-19-17 | |
| Zinc | 6.4 | 5.0 | 200.8 | | 10-19-17 | |
| Lab ID: | 10-249-14 | | | | | |
| Client ID: | TYLMO-20171018 | | | | | |
| Copper | 3.5 | 1.0 | 200.8 | | 10-19-17 | |
| Zinc | 8.8 | 5.0 | 200.8 | | 10-19-17 | |
| Lab ID: | 10-249-15 | | | | | |
| Client ID: | QA34-20171018 | | | | | |
| Copper | 3.1 | 1.0 | 200.8 | | 10-19-17 | |
| Zinc | 7.2 | 5.0 | 200.8 | | 10-19-17 | |



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**DISSOLVED METALS
EPA 200.8
METHOD BLANK QUALITY CONTROL**

Date Filtered: 10-17-17
Date Analyzed: 10-19-17

Matrix: Water
Units: ug/L (ppb)

Lab ID: MB1017F1

| Analyte | Method | Result | PQL |
|---------|--------|-----------|-----|
| Copper | 200.8 | ND | 1.0 |
| Zinc | 200.8 | ND | 5.0 |



Date of Report: November 1, 2017
Samples Submitted: October 19, 2017
Laboratory Reference: 1710-249
Project: 14-05806-000

**DISSOLVED METALS
EPA 200.8
DUPLICATE QUALITY CONTROL**

Date Filtered: 10-17-17
Date Analyzed: 10-19-17

Matrix: Water
Units: ug/L (ppb)

Lab ID: 10-217-02

| Analyte | Sample Result | Duplicate Result | RPD | PQL | Flags |
|---------|---------------|------------------|-----|-----|-------|
| Copper | 4.48 | 4.40 | 2 | 1.0 | |
| Zinc | 80.4 | 79.8 | 1 | 5.0 | |



Date of Report: November 1, 2017
 Samples Submitted: October 19, 2017
 Laboratory Reference: 1710-249
 Project: 14-05806-000

**DISSOLVED METALS
 EPA 200.8
 MS/MSD QUALITY CONTROL**

Date Filtered: 10-17-17

Date Analyzed: 10-19-17

Matrix: Water

Units: ug/L (ppb)

Lab ID: 10-217-02

| Analyte | Spike Level | MS | Percent Recovery | MSD | Percent Recovery | RPD | Flags |
|---------|-------------|-------------|------------------|-------------|------------------|-----|-------|
| Copper | 80.0 | 80.2 | 95 | 79.0 | 93 | 2 | |
| Zinc | 80.0 | 166 | 107 | 165 | 106 | 1 | |





Data Qualifiers and Abbreviations

- A - Due to a high sample concentration, the amount spiked is insufficient for meaningful MS/MSD recovery data.
 - B - The analyte indicated was also found in the blank sample.
 - C - The duplicate RPD is outside control limits due to high result variability when analyte concentrations are within five times the quantitation limit.
 - E - The value reported exceeds the quantitation range and is an estimate.
 - F - Surrogate recovery data is not available due to the high concentration of coeluting target compounds.
 - H - The analyte indicated is a common laboratory solvent and may have been introduced during sample preparation, and be impacting the sample result.
 - I - Compound recovery is outside of the control limits.
 - J - The value reported was below the practical quantitation limit. The value is an estimate.
 - K - Sample duplicate RPD is outside control limits due to sample inhomogeneity. The sample was re-extracted and re-analyzed with similar results.
 - L - The RPD is outside of the control limits.
 - M - Hydrocarbons in the gasoline range are impacting the diesel range result.
 - M1 - Hydrocarbons in the gasoline range (toluene-naphthalene) are present in the sample.
 - N - Hydrocarbons in the lube oil range are impacting the diesel range result.
 - N1 - Hydrocarbons in diesel range are impacting lube oil range results.
 - O - Hydrocarbons indicative of heavier fuels are present in the sample and are impacting the gasoline result.
 - P - The RPD of the detected concentrations between the two columns is greater than 40.
 - Q - Surrogate recovery is outside of the control limits.
 - S - Surrogate recovery data is not available due to the necessary dilution of the sample.
 - T - The sample chromatogram is not similar to a typical _____.
 - U - The analyte was analyzed for, but was not detected above the reported sample quantitation limit.
 - U1 - The practical quantitation limit is elevated due to interferences present in the sample.
 - V - Matrix Spike/Matrix Spike Duplicate recoveries are outside control limits due to matrix effects.
 - W - Matrix Spike/Matrix Spike Duplicate RPD are outside control limits due to matrix effects.
 - X - Sample extract treated with a mercury cleanup procedure.
 - X1 - Sample extract treated with a Sulfuric acid/Silica gel cleanup procedure.
 - Y - The calibration verification for this analyte exceeded the 20% drift specified in method 8260C, and therefore the reported result should be considered an estimate. The overall performance of the calibration verification standard met the acceptance criteria of the method.
 - Z -
- ND - Not Detected at PQL
 PQL - Practical Quantitation Limit
 RPD - Relative Percent Difference





Am Test Inc.
13600 NE 126TH PL
Suite C
Kirkland, WA 98034
(425) 885-1664

**Professional
Analytical
Services**

Nov 1 2017
On-Site Environmental
14648 NE 95th ST
Redmond, WA 98052
Attention: BLAIR GOODROW

Dear BLAIR GOODROW:

Enclosed please find the analytical data for your REDMOND PAIRED WATERSHED STUDY project.

The following is a cross correlation of client and laboratory identifications for your convenience.

| CLIENT ID | MATRIX | AMTEST ID | TEST |
|-----------------|--------|------------|------------|
| COLM-20171018 | Water | 17-A018548 | Micro, NUT |
| COUMI-20171018 | Water | 17-A018549 | Micro, NUT |
| COUMO-20171018 | Water | 17-A018550 | Micro, NUT |
| EVAMS-20171018 | Water | 17-A018551 | Micro, NUT |
| EVALSS-20171018 | Water | 17-A018552 | Micro, NUT |
| MONMN-20171018 | Water | 17-A018553 | Micro, NUT |
| MONMS-20171018 | Water | 17-A018554 | Micro, NUT |
| MONM-20171018 | Water | 17-A018555 | Micro, NUT |
| SEIMN-20171018 | Water | 17-A018556 | Micro, NUT |
| SEIMS-20171018 | Water | 17-A018557 | Micro, NUT |
| TOSMI-20171018 | Water | 17-A018558 | Micro, NUT |
| TOSMO-20171018 | Water | 17-A018559 | Micro, NUT |
| TYLMI-20171018 | Water | 17-A018560 | Micro, NUT |
| TYLMO-20171018 | Water | 17-A018561 | Micro, NUT |
| QA-20171018 | Water | 17-A018562 | Micro, NUT |

Your samples were received on Thursday, October 19, 2017. At the time of receipt, the samples were logged in and properly maintained prior to the subsequent analysis.

The analytical procedures used at AmTest are well documented and are typically derived from the protocols of the EPA, USDA, FDA or the Army Corps of Engineers.

Following the analytical data you will find the Quality Control (QC) results.

Please note that the detection limits that are listed in the body of the report refer to the Practical Quantitation Limits (PQL's), as opposed to the Method Detection Limits (MDL's).

Am Test Inc.
13600 NE 126TH PL
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Kirkland, WA 98034
(425) 885-1664

**Professional
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Nov 1 2017
On-Site Environmental
continued . . .

If you should have any questions pertaining to the data package, please feel free to contact me.

Sincerely,


Aaron W. Young
Laboratory Manager

Project #: 14-05806-000
PO Number: 10-249

BACT = Bacteriological
CONV = Conventional

MET = Metals
ORG = Organics

NUT=Nutrients
DEM=Demand

MIN=Minerals

Am Test Inc.
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(425) 885-1664
www.amtestlab.com



*Professional
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Services*

ANALYSIS REPORT

On-Site Environmental
14648 NE 95th ST
Redmond, WA 98052
Attention: BLAIR GOODROW
Project Name: REDMOND PAIRED WATERSHED STUDY
Project #: 14-05806-000
PO Number: 10-249
All results reported on an as received basis.

Date Received: 10/19/17
Date Reported: 11/ 1/17

AMTEST Identification Number 17-A018548
Client Identification COLM-20171018
Sampling Date 10/18/17, 21:20

Results

| PARAMETER | RESULT | UNITS | Q | D.L. | METHOD | ANALYST | DATE |
|--------------------------|--------|------------|---|------|-----------|---------|----------|
| Fecal Coliform | 380 | CFU/100 ml | | 1 | SM 9222D | JM | 10/19/17 |
| Total Nitrogen (NOX&TKN) | 0.26 | mg/l | | 0.1 | | | |
| Total Nitrogen (TKN) | 0.233 | mg/l | | 0.1 | SM4500N | JC | 10/30/17 |
| Nitrate + Nitrite | 0.024 | mg/l | | 0.01 | SM4500NO3 | JC | 10/27/17 |

AMTEST Identification Number 17-A018549
Client Identification COUMI-20171018
Sampling Date 10/18/17, 19:15

Results

| PARAMETER | RESULT | UNITS | Q | D.L. | METHOD | ANALYST | DATE |
|--------------------------|--------|------------|---|------|-----------|---------|----------|
| Fecal Coliform | 1600 | CFU/100 ml | | 1 | SM 9222D | JM | 10/19/17 |
| Total Nitrogen (NOX&TKN) | 2.25 | mg/l | | 0.1 | | | |
| Total Nitrogen (TKN) | 1.90 | mg/l | | 0.1 | SM4500N | JC | 10/30/17 |
| Nitrate + Nitrite | 0.35 | mg/l | | 0.01 | SM4500NO3 | JC | 10/27/17 |

AMTEST Identification Number 17-A018550
Client Identification COUMO-20171018
Sampling Date 10/18/17, 18:40

Results

| PARAMETER | RESULT | UNITS | Q | D.L. | METHOD | ANALYST | DATE |
|--------------------------|--------|------------|---|------|-----------|---------|----------|
| Fecal Coliform | 3000 | CFU/100 ml | | 1 | SM 9222D | JM | 10/19/17 |
| Total Nitrogen (NOX&TKN) | 1.22 | mg/l | | 0.1 | | | |
| Total Nitrogen (TKN) | 0.995 | mg/l | | 0.1 | SM4500N | JC | 10/30/17 |
| Nitrate + Nitrite | 0.22 | mg/l | | 0.01 | SM4500NO3 | JC | 10/27/17 |

AMTEST Identification Number 17-A018551
Client Identification EVAMS-20171018
Sampling Date 10/18/17, 19:25

Results

| PARAMETER | RESULT | UNITS | Q | D.L. | METHOD | ANALYST | DATE |
|--------------------------|--------|------------|---|------|-----------|---------|----------|
| Fecal Coliform | 1800 | CFU/100 ml | | 1 | SM 9222D | JM | 10/19/17 |
| Total Nitrogen (NOX&TKN) | 2.35 | mg/l | | 0.1 | | | |
| Total Nitrogen (TKN) | 0.752 | mg/l | | 0.1 | SM4500N | JC | 10/30/17 |
| Nitrate + Nitrite | 1.6 | mg/l | | 0.01 | SM4500NO3 | JC | 10/27/17 |

AMTEST Identification Number 17-A018552
Client Identification EVALSS-20171018
Sampling Date 10/18/17, 19:40

Results

| PARAMETER | RESULT | UNITS | Q | D.L. | METHOD | ANALYST | DATE |
|--------------------------|--------|------------|---|------|-----------|---------|----------|
| Fecal Coliform | 1100 | CFU/100 ml | | 1 | SM 9222D | JM | 10/19/17 |
| Total Nitrogen (NOX&TKN) | 1.95 | mg/l | | 0.1 | | | |
| Total Nitrogen (TKN) | 0.752 | mg/l | | 0.1 | SM4500N | JC | 10/30/17 |
| Nitrate + Nitrite | 1.2 | mg/l | | 0.01 | SM4500NO3 | JC | 10/27/17 |

AMTEST Identification Number 17-A018553
Client Identification MONMN-20171018
Sampling Date 10/18/17, 21:30

Results

| PARAMETER | RESULT | UNITS | Q | D.L. | METHOD | ANALYST | DATE |
|--------------------------|--------|------------|---|------|-----------|---------|----------|
| Fecal Coliform | 730 | CFU/100 ml | | 1 | SM 9222D | JM | 10/19/17 |
| Total Nitrogen (NOX&TKN) | 1.34 | mg/l | | 0.1 | | | |
| Total Nitrogen (TKN) | 1.10 | mg/l | | 0.1 | SM4500N | JC | 10/30/17 |
| Nitrate + Nitrite | 0.24 | mg/l | | 0.01 | SM4500NO3 | JC | 10/27/17 |

AMTEST Identification Number 17-A018554
Client Identification MONMS-20171018
Sampling Date 10/18/17, 21:50

Results

| PARAMETER | RESULT | UNITS | Q | D.L. | METHOD | ANALYST | DATE |
|--------------------------|--------|------------|---|------|-----------|---------|----------|
| Fecal Coliform | 2300 | CFU/100 ml | | 1 | SM 9222D | JM | 10/19/17 |
| Total Nitrogen (NOX&TKN) | 0.49 | mg/l | | 0.1 | | | |
| Total Nitrogen (TKN) | 0.274 | mg/l | | 0.1 | SM4500N | JC | 10/30/17 |
| Nitrate + Nitrite | 0.22 | mg/l | | 0.01 | SM4500NO3 | JC | 10/27/17 |

AMTEST Identification Number 17-A018555
Client Identification MONM-20171018
Sampling Date 10/18/17, 20:30

Results

| PARAMETER | RESULT | UNITS | Q | D.L. | METHOD | ANALYST | DATE |
|--------------------------|--------|------------|---|------|-----------|---------|----------|
| Fecal Coliform | 1500 | CFU/100 ml | | 1 | SM 9222D | JM | 10/19/17 |
| Total Nitrogen (NOX&TKN) | 1.15 | mg/l | | 0.1 | | | |
| Total Nitrogen (TKN) | 0.901 | mg/l | | 0.1 | SM4500N | JC | 10/30/17 |
| Nitrate + Nitrite | 0.25 | mg/l | | 0.01 | SM4500NO3 | JC | 10/27/17 |

AMTEST Identification Number 17-A018556
Client Identification SEIMN-20171018
Sampling Date 10/18/17, 20:40

Results

| PARAMETER | RESULT | UNITS | Q | D.L. | METHOD | ANALYST | DATE |
|--------------------------|--------|------------|---|------|-----------|---------|----------|
| Fecal Coliform | 300 | CFU/100 ml | | 1 | SM 9222D | JM | 10/19/17 |
| Total Nitrogen (NOX&TKN) | 1.06 | mg/l | | 0.1 | | | |
| Total Nitrogen (TKN) | 0.682 | mg/l | | 0.1 | SM4500N | JC | 10/30/17 |
| Nitrate + Nitrite | 0.38 | mg/l | | 0.01 | SM4500NO3 | JC | 10/27/17 |

AMTEST Identification Number 17-A018557
Client Identification SEIMS-20171018
Sampling Date 10/18/17, 22:30

Results

| PARAMETER | RESULT | UNITS | Q | D.L. | METHOD | ANALYST | DATE |
|--------------------------|--------|------------|---|------|-----------|---------|----------|
| Fecal Coliform | 340 | CFU/100 ml | | 1 | SM 9222D | JM | 10/19/17 |
| Total Nitrogen (NOX&TKN) | 1.28 | mg/l | | 0.1 | | | |
| Total Nitrogen (TKN) | 0.895 | mg/l | | 0.1 | SM4500N | JC | 10/30/17 |
| Nitrate + Nitrite | 0.39 | mg/l | | 0.01 | SM4500NO3 | JC | 10/27/17 |

AMTEST Identification Number 17-A018558
Client Identification TOSMI-20171018
Sampling Date 10/18/17, 18:40

Results

| PARAMETER | RESULT | UNITS | Q | D.L. | METHOD | ANALYST | DATE |
|--------------------------|--------|------------|---|------|-----------|---------|----------|
| Fecal Coliform | 500 | CFU/100 ml | | 1 | SM 9222D | JM | 10/19/17 |
| Total Nitrogen (NOX&TKN) | 1.16 | mg/l | | 0.1 | | | |
| Total Nitrogen (TKN) | 0.936 | mg/l | | 0.1 | SM4500N | JC | 10/30/17 |
| Nitrate + Nitrite | 0.22 | mg/l | | 0.01 | SM4500NO3 | JC | 10/27/17 |

AMTEST Identification Number 17-A018559
Client Identification TOSMO-20171018
Sampling Date 10/18/17, 20:00

Results

| PARAMETER | RESULT | UNITS | Q | D.L. | METHOD | ANALYST | DATE |
|--------------------------|--------|------------|---|------|-----------|---------|----------|
| Fecal Coliform | 680 | CFU/100 ml | | 1 | SM 9222D | JM | 10/19/17 |
| Total Nitrogen (NOX&TKN) | 1.28 | mg/l | | 0.1 | | | |
| Total Nitrogen (TKN) | 0.932 | mg/l | | 0.1 | SM4500N | JC | 10/30/17 |
| Nitrate + Nitrite | 0.35 | mg/l | | 0.01 | SM4500NO3 | JC | 10/27/17 |

AMTEST Identification Number 17-A018560
Client Identification TYLMI-20171018
Sampling Date 10/18/17, 21:00

Results

| PARAMETER | RESULT | UNITS | Q | D.L. | METHOD | ANALYST | DATE |
|--------------------------|--------|------------|---|------|-----------|---------|----------|
| Fecal Coliform | 740 | CFU/100 ml | | 1 | SM 9222D | JM | 10/19/17 |
| Total Nitrogen (NOX&TKN) | 1.43 | mg/l | | 0.1 | | | |
| Total Nitrogen (TKN) | 0.747 | mg/l | | 0.1 | SM4500N | JC | 10/30/17 |
| Nitrate + Nitrite | 0.68 | mg/l | | 0.01 | SM4500NO3 | JC | 10/27/17 |

AMTEST Identification Number 17-A018561
Client Identification TYLMO-20171018
Sampling Date 10/18/17, 20:35

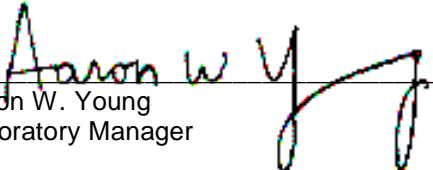
Results

| PARAMETER | RESULT | UNITS | Q | D.L. | METHOD | ANALYST | DATE |
|--------------------------|--------|------------|---|------|-----------|---------|----------|
| Fecal Coliform | 960 | CFU/100 ml | | 1 | SM 9222D | JM | 10/19/17 |
| Total Nitrogen (NOX&TKN) | 0.59 | mg/l | | 0.1 | | | |
| Total Nitrogen (TKN) | 0.264 | mg/l | | 0.1 | SM4500N | JC | 10/30/17 |
| Nitrate + Nitrite | 0.33 | mg/l | | 0.01 | SM4500NO3 | JC | 10/27/17 |

AMTEST Identification Number 17-A018562
Client Identification QA-20171018
Sampling Date 10/18/17, 19:25

Results

| PARAMETER | RESULT | UNITS | Q | D.L. | METHOD | ANALYST | DATE |
|--------------------------|--------|------------|---|------|-----------|---------|----------|
| Fecal Coliform | 1800 | CFU/100 ml | | 1 | SM 9222D | JM | 10/19/17 |
| Total Nitrogen (NOX&TKN) | 1.44 | mg/l | | 0.1 | | | |
| Total Nitrogen (TKN) | 1.10 | mg/l | | 0.1 | SM4500N | JC | 10/30/17 |
| Nitrate + Nitrite | 0.34 | mg/l | | 0.01 | SM4500NO3 | JC | 10/27/17 |


 Aaron W. Young
 Laboratory Manager

QC Summary for sample numbers: 17-A018548 to 17-A018562

DUPLICATES

| SAMPLE # | ANALYTE | UNITS | SAMPLE VALUE | DUP VALUE | RPD |
|------------|----------------------|------------|--------------|-----------|------|
| 17-A018552 | Fecal Coliform | CFU/100 ml | 1100 | 960 | 14. |
| 17-A018564 | Fecal Coliform | CFU/100 ml | 1100 | 980 | 12. |
| 17-A018323 | Total Nitrogen (TKN) | mg/l | < 0.1 | < 0.1 | |
| 17-A018517 | Total Nitrogen (TKN) | mg/l | 1.10 | 1.10 | 0.00 |
| 17-A018549 | Total Nitrogen (TKN) | mg/l | 1.90 | 1.70 | 11. |
| 17-A018559 | Total Nitrogen (TKN) | mg/l | 0.932 | 1.10 | 17. |
| 17-A018564 | Total Nitrogen (TKN) | mg/l | 0.642 | 0.658 | 2.5 |
| 17-A018423 | Nitrate + Nitrite | mg/l | 0.034 | 0.032 | 6.1 |
| 17-A018513 | Nitrate + Nitrite | mg/l | 1.4 | 1.6 | 13. |
| 17-A018523 | Nitrate + Nitrite | mg/l | 1.5 | 1.4 | 6.9 |
| 17-A018556 | Nitrate + Nitrite | mg/l | 0.38 | 0.36 | 5.4 |
| 17-A018566 | Nitrate + Nitrite | mg/l | 0.54 | 0.55 | 1.8 |
| 17-A018748 | Nitrate + Nitrite | mg/l | 9.9 | 9.9 | 0.00 |
| 17-A018869 | Nitrate + Nitrite | mg/l | 0.16 | 0.15 | 6.5 |
| 17-A018874 | Nitrate + Nitrite | mg/l | < 0.01 | < 0.01 | |

MATRIX SPIKES

| SAMPLE # | ANALYTE | UNITS | SAMPLE VALUE | SMPL+ SPK | SPK AMT | RECOVERY |
|------------|----------------------|-------|--------------|-----------|---------|----------|
| 17-A018323 | Total Nitrogen (TKN) | mg/l | < 0.1 | 2.06 | 2.00 | 103.00 % |
| 17-A018517 | Total Nitrogen (TKN) | mg/l | 1.10 | 3.20 | 2.00 | 105.00 % |
| 17-A018549 | Total Nitrogen (TKN) | mg/l | 1.90 | 4.00 | 2.00 | 105.00 % |
| 17-A018559 | Total Nitrogen (TKN) | mg/l | 0.932 | 3.00 | 2.00 | 103.40 % |
| 17-A018564 | Total Nitrogen (TKN) | mg/l | 0.642 | 2.72 | 2.00 | 103.90 % |
| 17-A018423 | Nitrate + Nitrite | mg/l | 0.034 | 1.1 | 1.0 | 106.60 % |
| 17-A018513 | Nitrate + Nitrite | mg/l | 1.4 | 2.4 | 1.0 | 100.00 % |
| 17-A018556 | Nitrate + Nitrite | mg/l | 0.38 | 1.4 | 1.0 | 102.00 % |
| 17-A018566 | Nitrate + Nitrite | mg/l | 0.54 | 1.6 | 1.0 | 106.00 % |
| 17-A018748 | Nitrate + Nitrite | mg/l | 9.9 | 16. | 5.0 | 122.00 % |
| 17-A018869 | Nitrate + Nitrite | mg/l | 0.16 | 1.3 | 1.0 | 114.00 % |
| 17-A018874 | Nitrate + Nitrite | mg/l | < 0.01 | 1.1 | 1.0 | 110.00 % |

QC Summary for sample numbers: 17-A018548 to 17-A018562...

STANDARD REFERENCE MATERIALS

| ANALYTE | UNITS | TRUE VALUE | MEASURED VALUE | RECOVERY |
|----------------------|-------|------------|----------------|----------|
| Total Nitrogen (TKN) | mg/l | 1.00 | 0.992 | 99.2 % |
| Total Nitrogen (TKN) | mg/l | 1.00 | 1.00 | 100. % |
| Nitrate + Nitrite | mg/l | 1.0 | 1.1 | 110. % |
| Nitrate + Nitrite | mg/l | 1.0 | 1.1 | 110. % |

BLANKS

| ANALYTE | UNITS | RESULT |
|----------------------|------------|--------|
| Fecal Coliform | CFU/100 ml | < 1 |
| Fecal Coliform | CFU/100 ml | < 1 |
| Total Nitrogen (TKN) | mg/l | < 0.1 |
| Total Nitrogen (TKN) | mg/l | < 0.1 |
| Nitrate + Nitrite | mg/l | < 0.01 |
| Nitrate + Nitrite | mg/l | < 0.01 |



14648 NE 95th Street, Redmond, WA 98052 · (425) 883-3881

Laboratory: AmTest Laboratories

Attention: Aaron Young

13600 NE 126th PI Kirkland, WA 98034

Phone Number: (425) 885-1664

Turnaround Request

1 Day 2 Day 3 Day

Standard

Other: _____

Laboratory Reference #: 10-249

Project Manager: Blair Goodrow

email: bgoodrow@onsite-env.com

Project Number: 14-05806-000

Project Name: Redmond Paired Watershed Study

| Lab ID | Sample Identification | Date Sampled | Time Sampled | Matrix | # of Cont. | Requested Analyses |
|-------------------------------------|----------------------------|---------------------|--------------|-----------------|--------------|--|
| 1 | COLM-20171018 <i>18548</i> | 10/18/17 | 2120 | Water | 2 | Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N |
| 2 | COUMI-20171018 <i>49</i> | 10/18/17 | 1915 | Water | 2 | Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N |
| 3 | COUMO-20171018 <i>50</i> | 10/18/17 | 1840 | Water | 2 | Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N |
| 4 | EVAMS-20171018 <i>51</i> | 10/18/17 | 1925 | Water | 2 | Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N |
| 5 | EVALSS-20171018 <i>52</i> | 10/18/17 | 1940 | Water | 2 | Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N |
| 6 | MONMN-20171018 <i>53</i> | 10/18/17 | 2130 | Water | 2 | Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N |
| 7 | MONMS-20171018 <i>54</i> | 10/18/17 | 2150 | Water | 2 | Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N |
| 8 | MONM-20171018 <i>55</i> | 10/18/17 | 2030 | Water | 2 | Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N |
| 9 | SEIMN-20171018 <i>56</i> | 10/18/17 | 2040 | Water | 2 | Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N |
| 10 | SEIMS-20171018 <i>57</i> | 10/18/17 | 2230 | Water | 2 | Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N |
| Signature | | Company | | Date | Time | Comments/Special Instructions |
| Relinquished by: <i>[Signature]</i> | | <i>OSR</i> | | <i>10/19/17</i> | <i>11:12</i> | |
| Received by: <i>[Signature]</i> | | <i>AMTEST T=3.4</i> | | <i>10/19/17</i> | <i>11:12</i> | |
| Relinquished by: | | | | | | |
| Received by: | | | | | | |
| Relinquished by: | | | | | | EDDs - CSV Reporting Limits: Fecal Coliform - 1.0 cfu/100ml Total Nitrogen - .10 mg/L |
| Received by: | | | | | | |

CLIENT



14648 NE 95th Street, Redmond, WA 98052 · (425) 883-3881

Laboratory: AmTest Laboratories

Attention: Aaron Young

13600 NE 126th PI Kirkland, WA 98034

Phone Number: (425) 885-1664

Turnaround Request

1 Day 2 Day 3 Day

Standard

Other: _____

Laboratory Reference #: 10-249

Project Manager: Blair Goodrow

email: bgoodrow@onsite-env.com

Project Number: 14-05806-000

Project Name: Redmond Paired Watershed Study

| Lab ID | Sample Identification | Date Sampled | Time Sampled | Matrix | # of Cont. | Requested Analyses |
|--------|-----------------------------|--------------|--------------|--------|------------|---|
| 11 | TOSMI-20171018 <i>18558</i> | 10/18/17 | 1840 | Water | 2 | Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N |
| 12 | TOSMO-20171018 <i>59</i> | 10/18/17 | 2000 | Water | 2 | Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N |
| 13 | TYLMI-20171018 <i>60</i> | 10/18/17 | 2100 | Water | 2 | Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N |
| 14 | TYLMO-20171018 <i>61</i> | 10/18/17 | 2035 | Water | 2 | Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N |
| 15 | QA-34-20171018 <i>62</i> | 10/18/17 | 1925 | Water | 2 | Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |

| Signature | Company | Date | Time | Comments/Special Instructions |
|-------------------------------------|---------------------|-----------------|--------------|--|
| Relinquished by: <i>[Signature]</i> | <i>OSE</i> | <i>10/19/17</i> | <i>11:12</i> | EDDs - CSV Reporting Limits: Fecal Coliform - 1.0 cfu/100ml Total Nitrogen - .10 mg/L |
| Received by: <i>[Signature]</i> | <i>AMTEST T=3.4</i> | <i>10/19/17</i> | <i>11:12</i> | |
| Relinquished by: | | | | |
| Received by: | | | | |
| Relinquished by: | | | | |
| Received by: | | | | |



14648 NE 95th Street, Redmond, WA 98052
Telephone: 425.883.3881

Company: Herrera Environmental Consultants
Project No.: 14-05806-000
Project Name: Redmond Paired Watershed Study
Project Manager: George Iftner

CHAIN OF CUSTODY

Turnaround Requested:

_____ 1 Day

_____ 2 Day

_____ 3 Day

Standard

Laboratory No. 10-249

Requested Analyses

| Total Suspended Solids (SM 2540D) | Turbidity (EPA 181.1) | Hardness (EPA 200.7 / SM 2340B) | Dissolved Organ Carbon (SM 5310B) * | Fecal Coliform (SM 9222D) | Total Phosphorus (EPA 365.1) | Total Nitrogen (SM 4500 N-B) | Total Cu and Zn (EPA 200.8) | Dissolved Cu and Zn (EPA 200.8) * |
|-----------------------------------|-----------------------|---------------------------------|-------------------------------------|---------------------------|------------------------------|------------------------------|-----------------------------|-----------------------------------|
|-----------------------------------|-----------------------|---------------------------------|-------------------------------------|---------------------------|------------------------------|------------------------------|-----------------------------|-----------------------------------|

| Lab ID | Sample Identification | Date Sampled | Time Sampled | Matrix | # of Cont. | Total Suspended Solids (SM 2540D) | Turbidity (EPA 181.1) | Hardness (EPA 200.7 / SM 2340B) | Dissolved Organ Carbon (SM 5310B) * | Fecal Coliform (SM 9222D) | Total Phosphorus (EPA 365.1) | Total Nitrogen (SM 4500 N-B) | Total Cu and Zn (EPA 200.8) | Dissolved Cu and Zn (EPA 200.8) * |
|--------|-----------------------|--------------|-------------------------|--------|------------|-----------------------------------|-----------------------|---------------------------------|-------------------------------------|---------------------------|------------------------------|------------------------------|-----------------------------|-----------------------------------|
| 1 | COLM-2017 1018 | 10-18-17 | 2120 | Water | 7 | X | X | X | X | X | X | X | X | X |
| 2 | COUMI-2017 1018 | | 1915 | Water | 7 | X | X | X | X | X | X | X | X | X |
| 3 | COUMO-2017 1018 | | 1840 | Water | 7 | X | X | X | X | X | X | X | X | X |
| 4 | EVAMS-2017 1018 | | 1925 | Water | 7 | X | X | X | X | X | X | X | X | X |
| 5 | EVALSS-2017 1018 | | 1940 | Water | 7 | X | X | X | X | X | X | X | X | X |
| 6 | MONMN-2017 1018 | | 2130 | Water | 7 | X | X | X | X | X | X | X | X | X |
| 7 | MONMS-2017 1018 | | 2130 2030 | Water | 7 | X | X | X | X | X | X | X | X | X |
| 8 | MONM-2017 1018 | | 2040 2040 | Water | 7 | X | X | X | X | X | X | X | X | X |
| 9 | SEIMN-2017 1018 | | 2040 2050 | Water | 7 | X | X | X | X | X | X | X | X | X |
| 10 | SEIMS-2017 1018 | | 2040 1840 | Water | 7 | X | X | X | X | X | X | X | X | X |
| 11 | TOSMI-2017 1018 | | 2000 1840 | Water | 7 | X | X | X | X | X | X | X | X | X |
| 12 | TOSMO-2017 1018 | | 2000 2000 | Water | 7 | X | X | X | X | X | X | X | X | X |
| 13 | TYLMI-2017 1018 | | 2000 2000 | Water | 7 | X | X | X | X | X | X | X | X | X |
| 14 | TYLMO-2017 1018 | | 2035 | Water | 7 | X | X | X | X | X | X | X | X | X |
| 15 | QA 34. 2017 1018 | | 1925 | Water | 7 | X | X | X | X | X | X | X | X | X |

Relinquished by M. Varrault Date 10.19.17 Received by [Signature] Date 10/19/17

Firm Herrera Time 9:00 Firm OSE Time 9:00 AM

Relinquished by _____ Date _____ Received by _____ Date _____

Firm _____ Time _____ Firm _____ Time _____

Comments:

* - field filtered with 0.45 µm filter within 15 minutes of collecting sample



CHAIN OF CUSTODY

14648 NE 95th Street, Redmond, WA 98052
Telephone: 425.883.3881

Company: Herrera Environmental Consultants
Project No.: 14-05806-000
Project Name: Redmond Paired Watershed Study
Project Manager: George Ittner

Turnaround Requested:

1 Day

2 Day

3 Day

Standard

Laboratory No. **10-249**

Requested Analyses

| | | | | | | | | | | | | | | | | | |
|-----------------------------------|-----------------------|---------------------------------|-------------------------------------|---------------------------|------------------------------|------------------------------|-----------------------------|-----------------------------------|--|--|--|--|--|--|--|--|--|
| Total Suspended Solids (SM 2540D) | Turbidity (EPA 181.1) | Hardness (EPA 200.7 / SM 2340B) | Dissolved Organ Carbon (SM 5310B) * | Fecal Coliform (SM 9222D) | Total Phosphorus (EPA 365.1) | Total Nitrogen (SM 4500 N-B) | Total Cu and Zn (EPA 200.8) | Dissolved Cu and Zn (EPA 200.8) * | | | | | | | | | |
|-----------------------------------|-----------------------|---------------------------------|-------------------------------------|---------------------------|------------------------------|------------------------------|-----------------------------|-----------------------------------|--|--|--|--|--|--|--|--|--|

| Lab ID | Sample Identification | Date Sampled | Time Sampled | Matrix | # of Cont. | Total Suspended Solids (SM 2540D) | Turbidity (EPA 181.1) | Hardness (EPA 200.7 / SM 2340B) | Dissolved Organ Carbon (SM 5310B) * | Fecal Coliform (SM 9222D) | Total Phosphorus (EPA 365.1) | Total Nitrogen (SM 4500 N-B) | Total Cu and Zn (EPA 200.8) | Dissolved Cu and Zn (EPA 200.8) * | | | |
|--------|-----------------------|--------------|------------------------------------|--------|------------|-----------------------------------|-----------------------|---------------------------------|-------------------------------------|---------------------------|------------------------------|------------------------------|-----------------------------|-----------------------------------|--|--|--|
| 1 | COLM-2017 1018 | 10-18-17 | 2120 | Water | 7 | X | X | X | X | X | X | X | X | X | | | |
| 2 | COUMI-2017 1018 | | 1915 | Water | 7 | X | X | X | X | X | X | X | X | X | | | |
| 3 | COUMO-2017 1018 | | 1840 | Water | 7 | X | X | X | X | X | X | X | X | X | | | |
| 4 | EVAMS-2017 1018 | | 1925 | Water | 7 | X | X | X | X | X | X | X | X | X | | | |
| 5 | EVALSS-2017 1018 | | 1940 | Water | 7 | X | X | X | X | X | X | X | X | X | | | |
| 6 | MONMN-2017 1018 | | 2130 | Water | 7 | X | X | X | X | X | X | X | X | X | | | |
| 7 | MONMS-2017 1018 | | 2130 2030 | Water | 7 | X | X | X | X | X | X | X | X | X | | | |
| 8 | MONM-2017 1018 | | 2040 2040 | Water | 7 | X | X | X | X | X | X | X | X | X | | | |
| 9 | SEIMN-2017 1018 | | 2040 2030 | Water | 7 | X | X | X | X | X | X | X | X | X | | | |
| 10 | SEIMS-2017 1018 | | 1840 1840 | Water | 7 | X | X | X | X | X | X | X | X | X | | | |
| 11 | TOSMI-2017 1018 | | 2000 2000 | Water | 7 | X | X | X | X | X | X | X | X | X | | | |
| 12 | TOSMO-2017 1018 | | 2100 2100 | Water | 7 | X | X | X | X | X | X | X | X | X | | | |
| 13 | TYLMI-2017 1018 | | 2100 2035 | Water | 7 | X | X | X | X | X | X | X | X | X | | | |
| 14 | TYLMO-2017 1018 | | 2035 | Water | 7 | X | X | X | X | X | X | X | X | X | | | |
| 15 | QA 34. 2017 1018 | | 1925 | Water | 7 | X | X | X | X | X | X | X | X | X | | | |

Correct time 2:230 →

Relinquished by M. Mammillo Date 10.19.17 Received by [Signature] Date 10/24/17

Firm Herrera Time 9:00 Firm OSE Time 9:00 AM

Relinquished by _____ Date _____ Received by _____ Date _____

Firm _____ Time _____ Firm _____ Time _____

Comments:
* - field filtered with 0.45 µm filter within 15 minutes of collecting sample

METER CALIBRATION LOG - Redmond Paired Watershed Study



Project Number: 14-05806-000
Personnel Performing Calibration: A. SVENDSEN
Meter: YSI PRO PLUS
Date/Time: 10/12/17 1500
Barometric Pressure Start of Day: mmHg: 748.2 Time: 1520
Barometric Pressure End of Day: mmHg: 747.2 Time: 1230 (10/14)

Calibration Procedures:
Rinse Multimeter Sonde Between Each Operation
 Rinse 3 times with tap water, 3 times with deionized water, then 3 times with the solution to be used for calibrating or testing.
Conductivity Calibration Notes:

| PRE Field Run CALIBRATION | Meter Reading | Buffer / Cal Std | Temp °C | Comments |
|---------------------------|---------------|------------------|---------|-----------------------------|
| Conductivity (µS/cm) | 5.2 | 0 | 23.9 | |
| Conductivity (µS/cm) | 1,002 | 1,000 | 24.0 | READS 1,000 µS/cm AFTER CAL |
| Conductivity (µS/cm) | 101.4 | 100 | 24.1 | |
| DO % Saturation | 97.2 | 100 | 24.0 | READS 99.7% AFTER CAL |

1. Dry the conductivity probe with a lab tissue (e.g., KimWipes®) and DI water.
2. Fill calibration cup to within a centimeter of the top of the calibration cup with DI water (0 µS).
3. Fill the calibration cup with 1,000 µS standard so that the temperature/conductivity probe is submerged.
4. Make sure there are no bubbles in the cell; wait 2 minutes.
5. Enter the appropriate standard value (1,000 µS/cm or 1.0 mS/cm) for Sp Cond.
6. Check conductivity using 100 µS/cm standard.

| POST Field Run CHECK | Meter Reading | Buffer / Cal Std | Temp °C | Comments |
|----------------------|---------------|------------------|---------|----------|
| Conductivity (µS/cm) | 3.5 | 0 | 24.0 | |
| Conductivity (µS/cm) | 102.1 | 100 | 24.3 | |
| DO % Saturation | 99.5 | 100 | 23.5 | |

- Dissolved Oxygen Calibration Notes:**
1. Fill the calibration cup with about 1/2 inch of DI; it should be below the sensor cap.
 2. Use KimWipes® to dry any droplets from the sensor cap.
 3. Invert calibration cup's cap and gently rest it on the cup.
 4. Wait 5 minutes, making sure that temperature stabilizes.
 5. Determine local barometric pressure (mm Hg) and enter this value into the meter.
 6. Click "Calibrate". "Calibrate Successful" will be displayed.
 7. To retain calibration accuracy between measurements, store with the sensor immersed in water or within a water-saturated air environment such as a sealed storage cup with at least 10 ml of water.
 8. It is important to have the water-saturated air and the sensor at the same temperature. Therefore, store a jar of DI in the same environment as the sonde and calibrate in a similar air temperature as the water and sonde.
 9. Keep probe out of direct sun or wind.

METER CALIBRATION LOG - Redmond Paired Watershed Study

Project Number: 14-05806-000
Personnel Performing Calibration: A. SVENDSEN
Meter: YSI PRO DSS 1
Date/Time: 10/18/17 1500
Barometric Pressure Start of Day: mmHg: 748.8 Time: 1525
Barometric Pressure End of Day: mmHg: 746.8 Time: 1230 (10/19)

Calibration Procedures:
Rinse Multimenter Sonde Between Each Operation
 Rinse 3 times with tap water, 3 times with deionized water, then 3 times with the solution to be used for calibrating or testing.
Conductivity Calibration Notes:



| PRE Field Run CALIBRATION | Meter Reading | Buffer / Cal Std | Temp °C | Comments |
|---------------------------|---------------|------------------|---------|-----------------------------|
| Conductivity (µS/cm) | 5.4 | 0 | 24.0 | |
| Conductivity (µS/cm) | 1,001 | 1,000 | 24.1 | READS 1,000 µS/cm AFTER CAL |
| Conductivity (µS/cm) | 101.3 | 100 | 24.0 | |
| DO % Saturation | 97.7 | 100 | 24.2 | READS 100% AFTER CAL |

1. Dry the conductivity probe with a lab tissue (e.g., KimWipes®) and DI water.
2. Fill calibration cup to within a centimeter of the top of the calibration cup with DI water (0 µS).
3. Fill the calibration cup with 1,000 µS standard so that the temperature/conductivity probe is submerged.
4. Make sure there are no bubbles in the cell; wait 2 minutes.
5. Enter the appropriate standard value (1,000 µS/cm or 1.0 mS/cm) for Sp Cond.
6. Check conductivity using 100 µS/cm standard.

| POST Field Run CHECK | Meter Reading | Buffer / Cal Std | Temp °C | Comments |
|----------------------|---------------|------------------|---------|----------|
| Conductivity (µS/cm) | 4.8 | 0 | 23.2 | |
| Conductivity (µS/cm) | 100.1 | 100 | 23.7 | |
| DO % Saturation | 101.3 | 100 | 23.4 | |

- Dissolved Oxygen Calibration Notes:**
1. Fill the calibration cup with about 1/2 inch of DI; it should be below the sensor cap.
 2. Use KimWipes® to dry any droplets from the sensor cap.
 3. Invert calibration cup's cap and gently rest it on the cup.
 4. Wait 5 minutes, making sure that temperature stabilizes.
 5. Determine local barometric pressure (mm Hg) and enter this value into the meter.
 6. Click "Calibrate". "Calibrate Successful" will be displayed.
 7. To retain calibration accuracy between measurements, store with the sensor immersed in water or within a water-saturated air environment such as a sealed storage cup with at least 10 ml of water.
 8. It is important to have the water-saturated air and the sensor at the same temperature. Therefore, store a jar of DI in the same environment as the sonde and calibrate in a similar air temperature as the water and sonde.
 9. Keep probe out of direct sun or wind.

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: BB, OS

Sample Date: 10.18.17

Base Flow or Storm Event? STORM

Sample Time: 21:20

Field Filtered Time: 21:25

(Must filter within 15 minutes of collection)

SITE

ID: COLMN

Project Number: 14-05806-000

Project Name: Redmond Paired Watershed Study

Current Weather and Temp: RAINING 58°



HERRERA

Water Quality Sampling

Sample ID: COLM-20171018

| Parameter | Bottle Type | Bottle Volume | # Bottles | Preservative | Duplicated? |
|---------------------------|-------------|---------------|-----------|--------------------------------|-------------|
| TSS and Turbidity | HDPE | 1L | 1 | NA | <u>N</u> |
| DOC * | HDPE | 250 ml | 1 | HCL | <u>N</u> |
| Fecal Col. Bact. | HDPE | 250 ml | 1 | EDTA | <u>N</u> |
| T. Phosphorous | HDPE | 250 ml | 1 | H ₂ SO ₄ | <u>N</u> |
| T Nitrogen | HDPE | 250 ml | 1 | H ₂ SO ₄ | <u>N</u> |
| Diss. Cu and Zn * | HDPE | 250 ml | 1 | HNO ₃ | <u>N</u> |
| Hardness, Total Cu and Zn | HDPE | 500 ml | 1 | HNO ₃ | <u>N</u> |

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID: _____

Filter blank sample ID: _____

Transfer blank sample ID: _____

Visual and Olfactory Conditions:

Clarity: CLEAR

Color: NAE

Odor: _____

Sheen: _____

Floatables: _____

LABORATORY DELIVERY

Date: _____

Time: _____

Quality Assurance

Checked By: Schulz

Signature: [Signature]

Date Checked: 11-15-17

Time: _____

Data Entered into Database? YES NO initials: _____

Date Entered: _____ Time: _____

Notes: _____

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

YSI Pro Plus (15D100020)

YSI Pro DSS 1 _____

YSI Pro DSS 2 _____

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): 5.45'

Reference Point (description): SG

Water Quality Measurements

Temperature (°C) 10.0

Specific Conductivity (µs/cm) 42.8

Dissolved Oxygen (mg/L) ~~8.05~~ 8.05

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: AS/AH

Sample Date: 10/18/17

Sample Time: 1915

PDT:

SITE ID: COUM1

Base Flow or Storm Event? Storm Event

Field Filtered Time: 1920

PST:

Project Number: 14-05806-000

(Must filter within 15 minutes of collection)



HERRERA

Project Name: Redmond Paired Watershed Study

Current Weather and Temp: STEADY RAIN, 59°F

Water Quality Sampling

Sample ID: COUM1-20171018

| Parameter | Bottle Type | Bottle Volume | # Bottles | Preservative | Duplicated? |
|---------------------------|-------------|---------------|-----------|--------------------------------|-------------|
| TSS and Turbidity | HDPE | 1L | 1 | NA | ✓ |
| DOC * | HDPE | 250 ml | 1 | HCL | ↓ |
| Fecal Col. Bact. | HDPE | 250 ml | 1 | EDTA | ↓ |
| T. Phosphorous | HDPE | 250 ml | 1 | H ₂ SO ₄ | ↓ |
| T. Nitrogen | HDPE | 250 ml | 1 | H ₂ SO ₄ | ↓ |
| Diss. Cu and Zn * | HDPE | 250 ml | 1 | HNO ₃ | ✓ |
| Hardness, Total Cu and Zn | HDPE | 500 ml | 1 | HNO ₃ | ✓ |

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID: QA-34 + 1925 20171018

Filter blank sample ID: /

Transfer blank sample ID: /

Visual and Olfactory Conditions:

Clarity: TURBID
 Color: Brown
 Odor: NONE
 Sheen: NONE
 Floatables: NONE

LABORATORY DELIVERY

Date: _____ Time: _____

Quality Assurance

Checked By: Brian Lenth

Signature: [Signature]

Date Checked: 11-15-17 Time: _____

Data Entered into Database? YES NO initials: _____

Date Entered: _____ Time: _____

Notes: _____

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

YSI Pro Plus (15D100020)

YSI Pro DSS-1

YSI Pro DSS-2

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): 2.79

Reference Point (description): 56

Water Quality Measurements

Temperature (°C) 12.0

Specific Conductivity (µs/cm) 127.3

Dissolved Oxygen (mg/L) 10.4

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: AS + AH

Sample Date: 10/16/17

Sample Time: 1840

PDT:

SITE ID: COUMO

Base Flow or Storm Event? Storm

Field Filtered Time: 1845

PST:

Project Number: 14-05806-000



HERRERA

Project Name: Redmond Paired Watershed Study

Current Weather and Temp: STEADY RAIN, 59°F

Water Quality Sampling

Sample ID: COUMO-20171018

| Parameter | Bottle Type | Bottle Volume | # Bottles | Preservative | Duplicated? |
|---------------------------|-------------|---------------|-----------|--------------------------------|-------------|
| TSS and Turbidity | HDPE | 1L | 1 | NA | N |
| DOC * | HDPE | 250 ml | 1 | HCL | |
| Fecal Col. Bact. | HDPE | 250 ml | 1 | EDTA | |
| T. Phosphorous | HDPE | 250 ml | 1 | H ₂ SO ₄ | |
| T. Nitrogen | HDPE | 250 ml | 1 | H ₂ SO ₄ | |
| Diss. Cu and Zn * | HDPE | 250 ml | 1 | HNO ₃ | |
| Hardness, Total Cu and Zn | HDPE | 500 ml | 1 | HNO ₃ | Y |

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID: _____
 Filter blank sample ID: _____
 Transfer blank sample ID: _____

Visual and Olfactory Conditions:

Clarity: TURBID
 Color: LIGHT BROWN
 Odor: NONE
 Sheen: NONE
 Floatables: LEAVES

LABORATORY DELIVERY

Date: _____ Time: _____

Quality Assurance

Checked By: John Lark Signature: [Signature]

Date Checked: 11-15-17 Time: _____

Data Entered into Database? YES NO initials: _____

Date Entered: _____ Time: _____

Notes: _____

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

YSI Pro Plus (15D100020) _____
 YSI Pro DSS-1 _____
 YSI Pro DSS 2 _____

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): 1.54
 Reference Point (description): SL

Water Quality Measurements

Temperature (°C) 12.9
 Specific Conductivity (µs/cm) 83.6
 Dissolved Oxygen (mg/L) 10.1

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: BB OS

Sample Date: 10/8/17

Sample Time: 19:25

PDT:

SITE ID: EVAMS

Base Flow or Storm Event? SDRM

Field Filtered Time: 19:30

PST:

Project Number: 14-05806-000

(Must filter within 15 minutes of collection)



HERRERA

Project Name: Redmond Paired Watershed Study

Current Weather and Temp: RAIN 62°

Water Quality Sampling

Sample ID: EVAMS-20171018

| Parameter | Bottle Type | Bottle Volume | # Bottles | Preservative | Duplicated? |
|---------------------------|-------------|---------------|-----------|--------------------------------|-------------|
| TSS and Turbidity | HDPE | 1L | 1 | NA | <u>N</u> |
| DOC * | HDPE | 250 ml | 1 | HCL | ↓ |
| Fecal Col. Bact. | HDPE | 250 ml | 1 | EDTA | |
| T. Phosphorous | HDPE | 250 ml | 1 | H ₂ SO ₄ | |
| T. Nitrogen | HDPE | 250 ml | 1 | H ₂ SO ₄ | |
| Diss. Cu and Zn * | HDPE | 250 ml | 1 | HNO ₃ | |
| Hardness, Total Cu and Zn | HDPE | 500 ml | 1 | HNO ₃ | <u>↓</u> |

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID: _____
 Filter blank sample ID: _____
 Transfer blank sample ID: _____

Visual and Olfactory Conditions:

Clarity: MOSTLY CLEAR
 Color: VERY LIGHT GRAY
 Odor: NONE
 Sheen: NONE
 Floatables: ORGANIC DEBRIS

LABORATORY DELIVERY

Date: _____ Time: _____

Quality Assurance

Checked By: John Lenth Signature: [Signature]
 Date Checked: 11-15-17 Time: _____
 Data Entered into Database? YES NO initials: _____
 Date Entered: _____ Time: _____
 Notes: _____

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

YSI Pro Plus (15D100020)
 YSI Pro DSS 1 _____
 YSI Pro DSS 2 _____

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): 3.93
 Reference Point (description): SG

Water Quality Measurements

Temperature (°C) 11.3
 Specific Conductivity (µs/cm) 190.5
 Dissolved Oxygen (mg/L) 10.6

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: BB OS

Sample Date: 10.18.17

Sample Time: 1940

PDT:

SITE ID: EVALSS

Base Flow or Storm Event? STORM

Field Filtered Time: 1945

PST:

Project Number: 14-05806-000

(Must filter within 15 minutes of collection)



Project Name: Redmond Paired Watershed Study

Current Weather and Temp: RAINING 600

Water Quality Sampling

Sample ID: EVALSS-20171018

| Parameter | Bottle Type | Bottle Volume | # Bottles | Preservative | Duplicated? |
|---------------------------|-------------|---------------|-----------|--------------------------------|-------------|
| TSS and Turbidity | HDPE | 1L | 1 | NA | |
| DOC * | HDPE | 250 ml | 1 | HCL | |
| Fecal Col. Bact. | HDPE | 250 ml | 1 | EDTA | |
| T. Phosphorous | HDPE | 250 ml | 1 | H ₂ SO ₄ | |
| T. Nitrogen | HDPE | 250 ml | 1 | H ₂ SO ₄ | |
| Diss. Cu and Zn * | HDPE | 250 ml | 1 | HNO ₃ | |
| Hardness, Total Cu and Zn | HDPE | 500 ml | 1 | HNO ₃ | |

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID:

Filter blank sample ID:

Transfer blank sample ID:

Visual and Olfactory Conditions:

Clarity: MOSTLY CLEAR
 Color: VERY LIGHT GRAY
 Odor: NONE
 Sheen: NONE
 Floatables: ORGANIC DEBRIS

LABORATORY DELIVERY

Date: _____ Time: _____

Quality Assurance

Checked By: Solan Lenth Signature:

Date Checked: 11-15-17 Time: _____

Data Entered into Database? YES NO initials:

Date Entered: _____ Time: _____

Notes:

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

YSI Pro Plus (15D100020)

YSI Pro DSS 1

YSI Pro DSS 2

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): 2.34

Reference Point (description): SG

Water Quality Measurements

Temperature (°C) 11.3

Specific Conductivity (µs/cm) 173.2

Dissolved Oxygen (mg/L) ~~1.28~~ 1.89

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: AS/AH

SITE ID: MONMN

Sample Date: 10/18/17 Sample Time: 2130 PDT:

Base Flow or Storm Event? Storm Event Field Filtered Time: 2135 PST:
(Must filter within 15 minutes of collection)

Project Number: 14-05806-000



Project Name: Redmond Paired Watershed Study

Current Weather and Temp: STEADY RAIN, 58°F

Water Quality Sampling

Sample ID: MONMN-20171018

| Parameter | Bottle Type | Bottle Volume | # Bottles | Preservative | Duplicated? |
|---------------------------|-------------|---------------|-----------|--------------------------------|-------------|
| TSS and Turbidity | HDPE | 1L | 1 | NA | N |
| DOC * | HDPE | 250 ml | 1 | HCL | ↓ |
| Fecal Col. Bact. | HDPE | 250 ml | 1 | EDTA | |
| T. Phosphorous | HDPE | 250 ml | 1 | H ₂ SO ₄ | |
| T. Nitrogen | HDPE | 250 ml | 1 | H ₂ SO ₄ | |
| Diss. Cu and Zn * | HDPE | 250 ml | 1 | HNO ₃ | |
| Hardness, Total Cu and Zn | HDPE | 500 ml | 1 | HNO ₃ | |

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID: _____
 Filter blank sample ID: _____
 Transfer blank sample ID: _____

Visual and Olfactory Conditions:

Clarity: MOD. TURBID
 Color: Light Brown
 Odor: _____
 Sheen: _____
 Floatables: LEAVES

LABORATORY DELIVERY

Date: _____ Time: _____

Quality Assurance

Checked By: Solan Louth Signature: [Signature]
 Date Checked: 11-15-17 Time: _____
 Data Entered into Database? YES NO initials:
 Date Entered: _____ Time: _____
 Notes: _____

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

YSI Pro Plus (15D100020) _____
 YSI Pro DSS-1 _____
 YSI Pro DSS-2 _____

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): 9.22
 Reference Point (description): SG

Water Quality Measurements

Temperature (°C) 11.1
 Specific Conductivity (µs/cm) 116.8
 Dissolved Oxygen (mg/L) 10.3

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: AS/AH
 Sample Date: 10/18/17 Sample Time: 2:50 PDT:
 Base Flow or Storm Event? _____ Field Filtered Time: _____ PST: _____
(Must filter within 15 minutes of collection)

SITE ID: MONMS
 Project Number: 14-05806-000



Project Name: Redmond Paired Watershed Study

Current Weather and Temp: STEADY RAIN, 58°F

Water Quality Sampling

Sample ID: MONMS-20171018

| Parameter | Bottle Type | Bottle Volume | # Bottles | Preservative | Duplicated? |
|---------------------------|-------------|---------------|-----------|--------------------------------|-------------|
| TSS and Turbidity | HDPE | 1L | 1 | NA | N |
| DOC * | HDPE | 250 ml | 1 | HCL | ↓ |
| Fecal Col. Bact. | HDPE | 250 ml | 1 | EDTA | |
| T. Phosphorous | HDPE | 250 ml | 1 | H ₂ SO ₄ | |
| T. Nitrogen | HDPE | 250 ml | 1 | H ₂ SO ₄ | |
| Diss. Cu and Zn * | HDPE | 250 ml | 1 | HNO ₃ | |
| Hardness, Total Cu and Zn | HDPE | 500 ml | 1 | HNO ₃ | |

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID: _____
 Filter blank sample ID: _____
 Transfer blank sample ID: _____

Visual and Olfactory Conditions:

Clarity: SLIGHTLY TURBID
 Color: NONE
 Odor: _____
 Sheen: _____
 Floatables: _____

LABORATORY DELIVERY

Date: _____ Time: _____

Quality Assurance

Checked By: John Leath Signature: _____
 Date Checked: 11-15-17 Time: _____
 Data Entered into Database? YES NO initials: _____
 Date Entered: _____ Time: _____
 Notes: _____

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

YSI Pro Plus (15D100020)
YSI Pro DSS 1
YSI Pro DSS 2

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): 6.60 FT

Reference Point (description): PVC STICKING UP

Water Quality Measurements

Temperature (°C) 12.1
 Specific Conductivity (µs/cm) 163.2
 Dissolved Oxygen (mg/L) 8.6

253 886 3126

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: BB OS

Sample Date: 10-18-17

Sample Time: 22:30

PDT:

SITE ID: MONM

Base Flow or Storm Event? Storm

Field Filtered Time: 22:35

PST:

Project Number: 14-05806-000

(Must filter within 15 minutes of collection)



HERRERA

Project Name: Redmond Paired Watershed Study

Current Weather and Temp: Partly 55°

Water Quality Sampling

Sample ID: MONM 2017 1018

| Parameter | Bottle Type | Bottle Volume | # Bottles | Preservative | Duplicated? |
|---------------------------|-------------|---------------|-----------|--------------------------------|-------------------------------------|
| TSS and Turbidity | HDPE | 1L | 1 | NA | <input checked="" type="checkbox"/> |
| DOC * | HDPE | 250 ml | 1 | HCL | <input type="checkbox"/> |
| Fecal Col. Bact. | HDPE | 250 ml | 1 | EDTA | <input type="checkbox"/> |
| T. Phosphorous | HDPE | 250 ml | 1 | H ₂ SO ₄ | <input type="checkbox"/> |
| T. Nitrogen | HDPE | 250 ml | 1 | H ₂ SO ₄ | <input type="checkbox"/> |
| Diss. Cu and Zn * | HDPE | 250 ml | 1 | HNO ₃ | <input type="checkbox"/> |
| Hardness, Total Cu and Zn | HDPE | 500 ml | 1 | HNO ₃ | <input checked="" type="checkbox"/> |

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID:

Filter blank sample ID:

Transfer blank sample ID:

Visual and Olfactory Conditions:

Clarity: CLEAR
 Color: LIGHT BROWN
 Odor: None
 Sheen: None
 Floatables: None

LABORATORY DELIVERY

Date: _____ Time: _____

Quality Assurance

Checked By: John Leath Signature: [Signature]
 Date Checked: 11-15-17 Time: _____
 Data Entered into Database? YES NO initials: _____
 Date Entered: _____ Time: _____
 Notes: _____

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

YSI Pro Plus (15D100020)

YSI Pro DSS 1

YSI Pro DSS 2

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): N/A

Reference Point (description): N/A

Water Quality Measurements

Temperature (°C) 11.9

Specific Conductivity (µs/cm) 140.3

Dissolved Oxygen (mg/L) 10.41

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: BB 05

Sample Date: 10-18-17

Sample Time: 20:40

PDT:

SITE ID: SEIMN

Base Flow or Storm Event? STORM

Field Filtered Time: 20:45

PST:

Project Number: 14-05806-000

(Must filter within 15 minutes of collection)



Project Name: Redmond Paired Watershed Study

Current Weather and Temp: RAINING 58°

Water Quality Sampling

Sample ID: SEIMN 20171018

| Parameter | Bottle Type | Bottle Volume | # Bottles | Preservative | Duplicated? |
|---------------------------|-------------|---------------|-----------|--------------------------------|-------------|
| TSS and Turbidity | HDPE | 1L | 1 | NA | <u>N</u> |
| DOC * | HDPE | 250 ml | 1 | HCL | <u>N</u> |
| Fecal Col. Bact. | HDPE | 250 ml | 1 | EDTA | <u>N</u> |
| T. Phosphorous | HDPE | 250 ml | 1 | H ₂ SO ₄ | <u>N</u> |
| T. Nitrogen | HDPE | 250 ml | 1 | H ₂ SO ₄ | <u>N</u> |
| Diss. Cu and Zn * | HDPE | 250 ml | 1 | HNO ₃ | <u>N</u> |
| Hardness, Total Cu and Zn | HDPE | 500 ml | 1 | HNO ₃ | <u>N</u> |

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID: _____
 Filter blank sample ID: _____
 Transfer blank sample ID: _____

Visual and Olfactory Conditions:

Clarity: SLIGHTLY CLOUDY
 Color: NONE
 Odor: NONE
 Sheen: NONE
 Floatables: NONE

LABORATORY DELIVERY

Date: _____ Time: _____

Quality Assurance

Checked By: Shay Lenth Signature: [Signature]
 Date Checked: 11-15-17 Time: _____
 Data Entered into Database? YES NO initials: _____
 Date Entered: _____ Time: _____
 Notes: _____

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

YSI Pro Plus (15D100020)
 YSI Pro DSS 1
 YSI Pro DSS 2

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): 7 3/8"

Reference Point (description): BOTTOM OF BELT TOP OF WSEL

Water Quality Measurements

Temperature (°C) 10.5
 Specific Conductivity (µs/cm) 53.1
 Dissolved Oxygen (mg/L) 1.22

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: AS/AH

Sample Date: 10/18/17

Sample Time: 2230

PDT:

SITE ID: SEIMS

Base Flow or Storm Event? Storm

Field Filtered Time: 2235

PST:

Project Number: 14-05806-000

(Must filter within 15 minutes of collection)



HERRERA

Project Name: Redmond Paired Watershed Study

Current Weather and Temp: STEADY RAIN, 58°F

Water Quality Sampling

Sample ID: SEIMS-20171018

| Parameter | Bottle Type | Bottle Volume | # Bottles | Preservative | Duplicated? |
|---------------------------|-------------|---------------|-----------|--------------------------------|-------------|
| TSS and Turbidity | HDPE | 1L | 1 | NA | <u>N</u> |
| DOC * | HDPE | 250 ml | 1 | HCL | |
| Fecal Col. Bact. | HDPE | 250 ml | 1 | EDTA | |
| T. Phosphorous | HDPE | 250 ml | 1 | H ₂ SO ₄ | |
| T. Nitrogen | HDPE | 250 ml | 1 | H ₂ SO ₄ | |
| Diss. Cu and Zn * | HDPE | 250 ml | 1 | HNO ₃ | <u>Y</u> |
| Hardness, Total Cu and Zn | HDPE | 500 ml | 1 | HNO ₃ | <u>Y</u> |

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID: _____
 Filter blank sample ID: _____
 Transfer blank sample ID: _____

Visual and Olfactory Conditions:

Clarity: SLIGHTLY TURBID
 Color: SLIGHT YELLOW/TANNIN
 Odor: _____
 Sheen: _____
 Floatables: LEAVES/NEEDLES

LABORATORY DELIVERY

Date: _____ Time: _____

Quality Assurance

Checked By: Zam Keith Signature: [Signature]
 Date Checked: 11-15-17 Time: _____
 Data Entered into Database? YES NO initials:
 Date Entered: _____ Time: _____
 Notes: _____

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

YSI Pro Plus (15D100020)

YSI Pro DSS 1

YSI Pro DSS 2

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): 0.89

Reference Point (description): SG

Water Quality Measurements

Temperature (°C) 10.2

Specific Conductivity (µs/cm) 97.6

Dissolved Oxygen (mg/L) 10.2

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: BB, OS

Sample Date: 10/18/17

Sample Time: 18:40

PDT:

SITE ID: TOSM1

Base Flow or Storm Event? STORM

Field Filtered Time: 18:45

PST:

Project Number: 14-05806-000

(Must filter within 15 minutes of collection)



Project Name: Redmond Paired Watershed Study

Current Weather and Temp: Rain 103°F

Water Quality Sampling

Sample ID: TOSM1-20171018

| Parameter | Bottle Type | Bottle Volume | # Bottles | Preservative | Duplicated? |
|---------------------------|-------------|---------------|-----------|--------------------------------|-------------|
| TSS and Turbidity | HDPE | 1L | 1 | NA | N |
| DOC * | HDPE | 250 ml | 1 | HCL | |
| Fecal Col. Bact. | HDPE | 250 ml | 1 | EDTA | |
| T. Phosphorous | HDPE | 250 ml | 1 | H ₂ SO ₄ | |
| T. Nitrogen | HDPE | 250 ml | 1 | H ₂ SO ₄ | |
| Diss. Cu and Zn * | HDPE | 250 ml | 1 | HNO ₃ | |
| Hardness, Total Cu and Zn | HDPE | 500 ml | 1 | HNO ₃ | |

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID: _____
 Filter blank sample ID: _____
 Transfer blank sample ID: _____

Visual and Olfactory Conditions:

Clarity: CLOUDY
 Color: BROWN
 Odor: NONE
 Sheen: NONE
 Floatables: SUSPENDED SEDIMENT + ORGANIC DEBRIS

LABORATORY DELIVERY

Date: _____ Time: _____

Quality Assurance

Checked By: Jane Leath Signature: [Signature]
 Date Checked: 11-15-17 Time: _____
 Data Entered into Database? YES NO Initials: _____
 Date Entered: _____ Time: _____
 Notes: _____

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

YSI Pro Plus (15D100020)
 YSI Pro DSS 1 _____
 YSI Pro DSS 2 _____

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): 1.09
 Reference Point (description): SG

Water Quality Measurements

Temperature (°C) 13.5
 Specific Conductivity (µs/cm) 14.7
 Dissolved Oxygen (mg/L) 10.82

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: AS/AA
 Sample Date: 10/18/17 Sample Time: 2000 PDT:
 Base Flow or Storm Event? Field Filtered Time: 2005 PST:
(Must filter within 15 minutes of collection)

SITE ID: TOSMO
 Project Number: 14-05806-000



Project Name: Redmond Paired Watershed Study

Current Weather and Temp: STEADY RAIN, 59°F

Water Quality Sampling

Sample ID: TOSMO-20171018

| Parameter | Bottle Type | Bottle Volume | # Bottles | Preservative | Duplicated? |
|---------------------------|-------------|---------------|-----------|--------------------------------|-------------|
| TSS and Turbidity | HDPE | 1L | 1 | NA | N |
| DOC * | HDPE | 250 ml | 1 | HCL | ↓ |
| Focal Col. Bact. | HDPE | 250 ml | 1 | EDTA | |
| T. Phosphorous | HDPE | 250 ml | 1 | H ₂ SO ₄ | |
| T. Nitrogen | HDPE | 250 ml | 1 | H ₂ SO ₄ | |
| Diss. Cu and Zn * | HDPE | 250 ml | 1 | HNO ₃ | |
| Hardness, Total Cu and Zn | HDPE | 500 ml | 1 | HNO ₃ | ↓ |

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID: NA
 Filter blank sample ID: ↓
 Transfer blank sample ID: ↓

Visual and Olfactory Conditions:

Clarity: TURBID
 Color: BROWN
 Odor: ---
 Sheen: ---
 Floatables: LEAVES

LABORATORY DELIVERY

Date: _____ Time: _____

Quality Assurance

Checked By: Sabin Lenth Signature: [Signature]
 Date Checked: 11-05-17 Time: _____
 Data Entered into Database? YES NO initials: _____
 Date Entered: _____ Time: _____
 Notes: _____

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

YSI Pro Plus (15D100020)
YSI Pro DSS 1
YSI Pro DSS 2

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): 0.89
 Reference Point (description): STO

Water Quality Measurements

Temperature (°C) 12.6
 Specific Conductivity (µs/cm) 76.7
 Dissolved Oxygen (mg/L) 10.5

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: AS/AH

Sample Date: 10/18/17

Sample Time: 2100

PDT: X

SITE ID: TYLMI

Base Flow or Storm-Event?

Field Filtered Time: 2105

PST:

Project Number: 14-05806-000

(Must filter within 15 minutes of collection)



HERRERA

Water Quality Sampling

Sample ID: TYLMI-20171018

Project Name: Redmond Paired Watershed Study

Current Weather and Temp: STEADY RAIN, 58°F

| Parameter | Bottle Type | Bottle Volume | # Bottles | Preservative | Duplicated? |
|---------------------------|-------------|---------------|-----------|--------------------------------|-------------|
| TSS and Turbidity | HDPE | 1L | 1 | NA | N |
| DOC * | HDPE | 250 ml | 1 | HCL | |
| Fecal Col. Bact. | HDPE | 250 ml | 1 | EDTA | |
| T. Phosphorous | HDPE | 250 ml | 1 | H ₂ SO ₄ | |
| T. Nitrogen | HDPE | 250 ml | 1 | H ₂ SO ₄ | |
| Diss. Cu and Zn * | HDPE | 250 ml | 1 | HNO ₃ | ✓ |
| Hardness, Total Cu and Zn | HDPE | 500 ml | 1 | HNO ₃ | ✓ |

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

| | |
|---------------------------|-------|
| Duplicate sample ID: | _____ |
| Filter blank sample ID: | _____ |
| Transfer blank sample ID: | _____ |

Visual and Olfactory Conditions:

Clarity: MODERATELY TURBID
 Color: LIGHT BROWN
 Odor: _____
 Sheen: _____
 Floatables: _____

LABORATORY DELIVERY

Date: _____ Time: _____

Quality Assurance

Checked By: Silvia Lenth Signature: [Signature]
 Date Checked: 11-15-17 Time: _____
 Data Entered into Database? YES NO initials:
 Date Entered: _____ Time: _____
 Notes: _____

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

YSI Pro Plus (15D100020)

YSI Pro DSS 1

YSI Pro DSS 2

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): 4.43

Reference Point (description): TOP OF CURB TO H₂O

Water Quality Measurements

Temperature (°C) 12.7

Specific Conductivity (µs/cm) 124.9

Dissolved Oxygen (mg/L) 10.0

[Handwritten signature]

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: AS/AA

Sample Date: 10/18/17

Sample Time: 2035

PDT:

SITE ID: TYLMO

Base Flow or Storm Event? (circled)

Field Filtered Time: 2040

PST:

Project Number: 14-05806-000



HERRERA

Project Name: Redmond Paired Watershed Study

Current Weather and Temp: STEADY RAIN, 58°F

Water Quality Sampling

Sample ID: TYLMO-20171018

| Parameter | Bottle Type | Bottle Volume | # Bottles | Preservative | Duplicated? |
|---------------------------|-------------|---------------|-----------|--------------------------------|-------------|
| TSS and Turbidity | HDPE | 1L | 1 | NA | N |
| DOC * | HDPE | 250 ml | 1 | HCL | |
| Fecal Col. Bact. | HDPE | 250 ml | 1 | EDTA | |
| T. Phosphorous | HDPE | 250 ml | 1 | H ₂ SO ₄ | |
| T. Nitrogen | HDPE | 250 ml | 1 | H ₂ SO ₄ | |
| Diss. Cu and Zn * | HDPE | 250 ml | 1 | HNO ₃ | |
| Hardness, Total Cu and Zn | HDPE | 500 ml | 1 | HNO ₃ | |

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID:
 Filter blank sample ID:
 Transfer blank sample ID:

Visual and Olfactory Conditions:

Clarity: MODERATELY TURBID
 Color: LIGHT BROWN
 Odor:
 Sheen:
 Floatables:

LABORATORY DELIVERY

Date: Time:

Quality Assurance

Checked By: John Lentz Signature: [Signature]
 Date Checked: 11-15-17 Time:
 Data Entered into Database? YES NO initials:
 Date Entered: Time:
 Notes:

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

YSI Pro Plus (15D100020)
YSI Pro DSS 1
YSI Pro DSS 2

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): 2.66 FT
 Reference Point (description): TOP OF CURB TO H₂O

Water Quality Measurements

Temperature (°C) 12.5
 Specific Conductivity (µs/cm) 65.9
 Dissolved Oxygen (mg/L) 10.2



Data Quality Assurance Worksheet

Project Name/No./Client: Redmond Paired Watershed Study / 14-05806-000 / City of Redmond

Laboratory/Parameters: OnSite Environmental : TSS, turbidity, hardness, DOC, TP, Dissolved & Total Cu, Zn / AmTest: Total nitrogen, fecal coliform bacteria

Sample Date/Sample ID: 10/18/2017 / All sites, 1 FD (QA33) at COUMI

By G. Catarra

Date 11/13/2017 Page 1 of 2

Checked: initials JL

date 11/17/2017

| Parameter | Completeness/ Methodology | Pre-preservation Holding Times (minutes) | | Total Holding Times (days) | | Method Blanks Reporting Limit | Matrix Spikes/ Surrogate Recovery (%) | | Lab Control Samples Recovery (%) | | Lab Duplicates RPD (%) | | Field Duplicates RPD (%) | | Instrument Calibration/ Performance | ACTION |
|-------------------------------------|------------------------------|--|------|-------------------------------|------|--|---|-------------------|--|-------------------|---------------------------|-------------------|-----------------------------|-------------------|---|---|
| | | Reported | Goal | Reported | Goal | | Reported | Goal ¹ | Reported | Goal ¹ | Reported | Goal ¹ | Reported | Goal ¹ | | |
| TSS | OK / SM 2540D | NA | NA | 6 | ≤7 | ≤1.0 mg/L 1.0 mg/L | NA | NA | 91 | ±20 | 17 | ≤25 | 0 | ≤25 | OK | NONE |
| Turbidity | OK / EPA 180.1 | NA | NA | 2 | ≤2 | ≤0.1 NTU 0.1 NTU | NA | NA | NA | ±10 | 2 | ≤25 | 27 | ≤25 | OK | FLAG COUMI DUE TO FD RPD. |
| Hardness | OK / SM 2340B | NA | NA | 5 | ≤180 | ≤1.0 mg/L 1.0 mg/L | 98,103 | ±25 | 100 | ±15 | 6 | ≤20 | 1.6 | ≤20 | OK | NONE |
| DOC | OK / SM 5310B | <15 | ≤15 | 8 | ≤28 | ≤1.0 mg/L 1.0 mg/L | 88 | ±25 | 107 | ±15 | 3 | ≤20 | 8.0 | ≤20 | OK | NONE |
| Total Phosphorus | OK / EPA 365.1 | NA | NA | 6 | ≤28 | ≤0.01 mg/L 0.01 mg/L | 98 | ±25 | 90 | ±20 | 7 | ≤20 | 6.1 | ≤20 | OK | NONE |
| Total Nitrogen (TKN + N+N) | OK/ SM 4500 N-B | NA | NA | 9,12 | ≤28 | ≤0.1 mg/L 0.1 mg/L | 102-106 | ±25 | 99-100 | ±20 | 5.4-17 | ≤20 | 53, 2.9 | ≤20 | OK | FLAG TKN DATA FOR COUMI DUE TO FD RPD. |

¹ If the sample or duplicate value is less than five times the reporting limit, the difference is calculated rather than the relative percent difference (RPD). The QA goal is a difference <2 times the detection limit instead of the number indicated in the goal column.

NA – not applicable or not available; NC – not calculable due to one or more values below the detection limit; NS – field duplicate not sampled.



Data Quality Assurance Worksheet

By G. Catarra

Project Name/No./Client: Redmond Paired Watershed Study / 14-05806-000 / City of Redmond

Date 11/13/2017 Page 2 of 2

Laboratory/Parameters: OnSite Environmental : TSS, turbidity, hardness, DOC, TP, Dissolved & Total Cu, Zn / AmTest: total nitrogen, fecal coliform bacteria

Checked: initials JL

Sample Date/Sample ID: 10/18/2017 / All sites, 1 FD (QA33) at COUMI

date 11/17/2017

| Parameter | Completeness/ Methodology | Pre-preservation Holding Times (minutes) | | Total Holding Times (days) | | Method Blanks Reporting Limit | Matrix Spikes/ Surrogate Recovery (%) | | Lab Control Samples Recovery (%) | | Lab Duplicates RPD (%) | | Field Duplicates RPD (%) | | Instrument Calibration/ Performance | ACTION |
|---------------------|------------------------------|--|------|-------------------------------|------|---|---|-------------------|--|------|---------------------------|-------------------|-----------------------------|-------------------|---|--------|
| | | Reported | Goal | Reported | Goal | | Reported | Goal ¹ | Reported | Goal | Reported | Goal ¹ | Reported | Goal ¹ | | |
| Total Copper | OK/ EPA 200.8 | NA | NA | 6 | ≤180 | ≤1.0 µg/L 1.0 µg/L | 92,94 | ±25 | NR | ±15 | 2 | ≤20 | 4.6 | ≤20 | OK | NONE |
| Total Zinc | OK/ EPA 200.8 | NA | NA | 6 | ≤180 | ≤5.0 µg/L 5.0 µg/L | 108,111 | ±25 | NR | ±15 | NC | ≤20 | 7.4 | ≤20 | OK | NONE |
| Dissolved Copper | OK/ EPA 200.8 | <15 | ≤15 | 1 | ≤180 | ≤1.0 µg/L 1.0 µg/L | 95,93 | ±25 | NR | ±15 | 2 | ≤20 | 3.3 | ≤20 | OK | NONE |
| Dissolved Zinc | OK/ EPA 200.8 | <15 | ≤15 | 1 | ≤180 | ≤5.0 µg/L 5.0 µg/L | 107,106 | ±25 | NR | ±15 | 1 | ≤20 | 2.7 | ≤20 | OK | NONE |
| Fecal Coliform | OK / SM 9222D | NA | NA | 1 | ≤1 | ≤1.0 cfu/ 100mL 1.0 cfu/ 100mL | NA | NA | NA | NA | 14 | ≤35 | 12 | ≤50 | OK | NONE |

¹ If the sample or duplicate value is less than five times the reporting limit, the difference is calculated rather than the relative percent difference (RPD). The QA goal is a difference <2 times the detection limit instead of the number indicated in the goal column.

NA – not applicable or not available; NC – not calculable due to one or more values below the detection limit; NS – field duplicate not sampled.



14648 NE 95th Street, Redmond, WA 98052 • (425) 883-3881

November 28, 2017

George Iftner
Herrera Environmental Consultants, Inc.
2200 6th Avenue, Suite 1100
Seattle, WA 98121

Re: Analytical Data for Project 14-05806-000
Laboratory Reference No. 1711-147

Dear George:

Enclosed are the analytical results and associated quality control data for samples submitted on November 13, 2017.

The standard policy of OnSite Environmental, Inc. is to store your samples for 30 days from the date of receipt. If you require longer storage, please contact the laboratory.

We appreciate the opportunity to be of service to you on this project. If you have any questions concerning the data, or need additional information, please feel free to call me.

Sincerely,

A handwritten signature in black ink, appearing to read "Blair Goodrow", enclosed within a large, loopy circular flourish.

Blair Goodrow
Project Manager

Enclosures



OnSite Environmental, Inc. 14648 NE 95th Street, Redmond, WA 98052 (425) 883-3881

This report pertains to the samples analyzed in accordance with the chain of custody, and is intended only for the use of the individual or company to whom it is addressed.

Date of Report: November 28, 2017
Samples Submitted: November 13, 2017
Laboratory Reference: 1711-147
Project: 14-05806-000

Case Narrative

Samples were collected on November 12, 2017 and received by the laboratory on November 13, 2017. They were maintained at the laboratory at a temperature of 2°C to 6°C.

Please note that any and all soil sample results are reported on a dry-weight basis, unless otherwise noted below.

General QA/QC issues associated with the analytical data enclosed in this laboratory report will be indicated with a reference to a comment or explanation on the Data Qualifier page. More complex and involved QA/QC issues will be discussed in detail below.

Total Phosphorus EPA 365.1 Analysis

The duplicate RPD is outside control limits due to the inherently high percentage variability of samples that are within five times the detection limit.

Any other QA/QC issues associated with this extraction and analysis will be indicated with a footnote reference and discussed in detail on the Data Qualifier page.



Date of Report: November 28, 2017
 Samples Submitted: November 13, 2017
 Laboratory Reference: 1711-147
 Project: 14-05806-000

**TOTAL SUSPENDED SOLIDS
 SM 2540D**

Matrix: Water
 Units: mg/L

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|------------------------|----------------------|-----|----------|---------------|---------------|-------|
| Client ID: | COLM-20171112 | | | | | |
| Laboratory ID: | 11-147-01 | | | | | |
| Total Suspended Solids | ND | 1.0 | SM 2540D | 11-14-17 | 11-15-17 | |

| | | | | | | |
|------------------------|-----------------------|-----|----------|----------|----------|--|
| Client ID: | COUMI-20171112 | | | | | |
| Laboratory ID: | 11-147-02 | | | | | |
| Total Suspended Solids | 45 | 1.7 | SM 2540D | 11-14-17 | 11-15-17 | |

| | | | | | | |
|------------------------|-----------------------|-----|----------|----------|----------|--|
| Client ID: | COUMO-20171112 | | | | | |
| Laboratory ID: | 11-147-03 | | | | | |
| Total Suspended Solids | 24 | 1.7 | SM 2540D | 11-14-17 | 11-15-17 | |

| | | | | | | |
|------------------------|-----------------------|-----|----------|----------|----------|--|
| Client ID: | EVAMS-20171112 | | | | | |
| Laboratory ID: | 11-147-04 | | | | | |
| Total Suspended Solids | 6.6 | 1.0 | SM 2540D | 11-14-17 | 11-15-17 | |

| | | | | | | |
|------------------------|------------------------|-----|----------|----------|----------|--|
| Client ID: | EVALSS-20171112 | | | | | |
| Laboratory ID: | 11-147-05 | | | | | |
| Total Suspended Solids | 4.4 | 1.0 | SM 2540D | 11-14-17 | 11-15-17 | |

| | | | | | | |
|------------------------|-----------------------|-----|----------|----------|----------|--|
| Client ID: | MONMN-20171112 | | | | | |
| Laboratory ID: | 11-147-06 | | | | | |
| Total Suspended Solids | 2.4 | 1.0 | SM 2540D | 11-14-17 | 11-15-17 | |

| | | | | | | |
|------------------------|-----------------------|-----|----------|----------|----------|--|
| Client ID: | MONMS-20171112 | | | | | |
| Laboratory ID: | 11-147-07 | | | | | |
| Total Suspended Solids | 2.0 | 1.0 | SM 2540D | 11-14-17 | 11-15-17 | |



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**TOTAL SUSPENDED SOLIDS
 SM 2540D**

Matrix: Water
 Units: mg/L

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|------------------------|----------------------|-----|----------|---------------|---------------|-------|
| Client ID: | MONM-20171112 | | | | | |
| Laboratory ID: | 11-147-08 | | | | | |
| Total Suspended Solids | 3.4 | 1.0 | SM 2540D | 11-14-17 | 11-15-17 | |

| | | | | | | |
|------------------------|-----------------------|-----|----------|----------|----------|--|
| Client ID: | SEIMN-20171112 | | | | | |
| Laboratory ID: | 11-147-09 | | | | | |
| Total Suspended Solids | 7.8 | 1.0 | SM 2540D | 11-14-17 | 11-15-17 | |

| | | | | | | |
|------------------------|-----------------------|-----|----------|----------|----------|--|
| Client ID: | SEIMS-20171112 | | | | | |
| Laboratory ID: | 11-147-10 | | | | | |
| Total Suspended Solids | 2.4 | 1.0 | SM 2540D | 11-14-17 | 11-15-17 | |

| | | | | | | |
|------------------------|-----------------------|-----|----------|----------|----------|--|
| Client ID: | TOSMI-20171112 | | | | | |
| Laboratory ID: | 11-147-11 | | | | | |
| Total Suspended Solids | 72 | 1.0 | SM 2540D | 11-14-17 | 11-15-17 | |

| | | | | | | |
|------------------------|-----------------------|-----|----------|----------|----------|--|
| Client ID: | TOSMO-20171112 | | | | | |
| Laboratory ID: | 11-147-12 | | | | | |
| Total Suspended Solids | 31 | 1.4 | SM 2540D | 11-14-17 | 11-15-17 | |

| | | | | | | |
|------------------------|-----------------------|-----|----------|----------|----------|--|
| Client ID: | TYLMI-20171112 | | | | | |
| Laboratory ID: | 11-147-13 | | | | | |
| Total Suspended Solids | 3.0 | 1.0 | SM 2540D | 11-14-17 | 11-15-17 | |

| | | | | | | |
|------------------------|-----------------------|-----|----------|----------|----------|--|
| Client ID: | TYLMO-20171112 | | | | | |
| Laboratory ID: | 11-147-14 | | | | | |
| Total Suspended Solids | 8.8 | 1.0 | SM 2540D | 11-14-17 | 11-15-17 | |



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TOTAL SUSPENDED SOLIDS
SM 2540D

Matrix: Water
Units: mg/L

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|------------------------|----------------------|------------|---------------|----------------------|----------------------|--------------|
| Client ID: | QA35-20171112 | | | | | |
| Laboratory ID: | 11-147-15 | | | | | |
| Total Suspended Solids | 19 | 1.0 | SM 2540D | 11-14-17 | 11-15-17 | |



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**TOTAL SUSPENDED SOLIDS
 SM 2540D
 QUALITY CONTROL**

Matrix: Water
 Units: mg/L

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|------------------------|-----------|-----|----------|---------------|---------------|-------|
| METHOD BLANK | | | | | | |
| Laboratory ID: | MB1115W1 | | | | | |
| Total Suspended Solids | ND | 1.0 | SM 2540D | 11-14-17 | 11-15-17 | |

| Analyte | Result | Spike Level | Source Result | Percent Recovery | Recovery Limits | RPD | RPD Limit | Flags |
|------------------------|-------------|-------------|---------------|------------------|-----------------|-----|-----------|-------|
| DUPLICATE | | | | | | | | |
| Laboratory ID: | 11-147-04 | | | | | | | |
| | ORIG | DUP | | | | | | |
| Total Suspended Solids | 6.60 | 6.40 | NA | NA | NA | 3 | 17 | |

| | | | | | | | | |
|------------------------|------------|-----|----|-----|--------|----|----|--|
| SPIKE BLANK | | | | | | | | |
| Laboratory ID: | SB1115W1 | | | | | | | |
| | SB | SB | | SB | | | | |
| Total Suspended Solids | 108 | 100 | NA | 108 | 76-114 | NA | NA | |



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TURBIDITY
EPA 180.1

Matrix: Water
 Units: NTU

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|-------------------|------------------------|------|-----------|---------------|---------------|-------|
| Client ID: | COLM-20171112 | | | | | |
| Laboratory ID: | 11-147-01 | | | | | |
| Turbidity | 0.44 | 0.10 | EPA 180.1 | 11-14-17 | 11-14-17 | |
| Client ID: | COUMI-20171112 | | | | | |
| Laboratory ID: | 11-147-02 | | | | | |
| Turbidity | 11 | 0.10 | EPA 180.1 | 11-14-17 | 11-14-17 | |
| Client ID: | COUMO-20171112 | | | | | |
| Laboratory ID: | 11-147-03 | | | | | |
| Turbidity | 6.8 | 0.10 | EPA 180.1 | 11-14-17 | 11-14-17 | |
| Client ID: | EVAMS-20171112 | | | | | |
| Laboratory ID: | 11-147-04 | | | | | |
| Turbidity | 1.4 | 0.10 | EPA 180.1 | 11-14-17 | 11-14-17 | |
| Client ID: | EVALSS-20171112 | | | | | |
| Laboratory ID: | 11-147-05 | | | | | |
| Turbidity | 1.6 | 0.10 | EPA 180.1 | 11-14-17 | 11-14-17 | |
| Client ID: | MONMN-20171112 | | | | | |
| Laboratory ID: | 11-147-06 | | | | | |
| Turbidity | 2.1 | 0.10 | EPA 180.1 | 11-14-17 | 11-14-17 | |
| Client ID: | MONMS-20171112 | | | | | |
| Laboratory ID: | 11-147-07 | | | | | |
| Turbidity | 1.6 | 0.10 | EPA 180.1 | 11-14-17 | 11-14-17 | |



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TURBIDITY
EPA 180.1

Matrix: Water
 Units: NTU

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|-------------------|----------------------|------|-----------|---------------|---------------|-------|
| Client ID: | MONM-20171112 | | | | | |
| Laboratory ID: | 11-147-08 | | | | | |
| Turbidity | 3.1 | 0.10 | EPA 180.1 | 11-14-17 | 11-14-17 | |

| | | | | | | |
|-------------------|-----------------------|------|-----------|----------|----------|--|
| Client ID: | SEIMN-20171112 | | | | | |
| Laboratory ID: | 11-147-09 | | | | | |
| Turbidity | 2.7 | 0.10 | EPA 180.1 | 11-14-17 | 11-14-17 | |

| | | | | | | |
|-------------------|-----------------------|------|-----------|----------|----------|--|
| Client ID: | SEIMS-20171112 | | | | | |
| Laboratory ID: | 11-147-10 | | | | | |
| Turbidity | 1.7 | 0.10 | EPA 180.1 | 11-14-17 | 11-14-17 | |

| | | | | | | |
|-------------------|-----------------------|------|-----------|----------|----------|--|
| Client ID: | TOSMI-20171112 | | | | | |
| Laboratory ID: | 11-147-11 | | | | | |
| Turbidity | 7.6 | 0.10 | EPA 180.1 | 11-14-17 | 11-14-17 | |

| | | | | | | |
|-------------------|-----------------------|------|-----------|----------|----------|--|
| Client ID: | TOSMO-20171112 | | | | | |
| Laboratory ID: | 11-147-12 | | | | | |
| Turbidity | 13 | 0.10 | EPA 180.1 | 11-14-17 | 11-14-17 | |

| | | | | | | |
|-------------------|-----------------------|------|-----------|----------|----------|--|
| Client ID: | TYLMI-20171112 | | | | | |
| Laboratory ID: | 11-147-13 | | | | | |
| Turbidity | 3.3 | 0.10 | EPA 180.1 | 11-14-17 | 11-14-17 | |

| | | | | | | |
|-------------------|-----------------------|------|-----------|----------|----------|--|
| Client ID: | TYLMO-20171112 | | | | | |
| Laboratory ID: | 11-147-14 | | | | | |
| Turbidity | 3.9 | 0.10 | EPA 180.1 | 11-14-17 | 11-14-17 | |



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TURBIDITY
EPA 180.1

Matrix: Water
Units: NTU

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|-------------------|----------------------|------------|---------------|----------------------|----------------------|--------------|
| Client ID: | QA35-20171112 | | | | | |
| Laboratory ID: | 11-147-15 | | | | | |
| Turbidity | 6.2 | 0.10 | EPA 180.1 | 11-14-17 | 11-14-17 | |



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**TURBIDITY
 EPA 180.1
 QUALITY CONTROL**

Matrix: Water
 Units: NTU

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|---------------------|-----------|------|-----------|---------------|---------------|-------|
| METHOD BLANK | | | | | | |
| Laboratory ID: | MB1114W1 | | | | | |
| Turbidity | ND | 0.10 | EPA 180.1 | 11-14-17 | 11-14-17 | |

| Analyte | Result | Spike Level | Source Result | Percent Recovery | Recovery Limits | RPD | RPD Limit | Flags |
|------------------|--------------|--------------|---------------|------------------|-----------------|-----|-----------|-------|
| DUPLICATE | | | | | | | | |
| Laboratory ID: | 11-147-01 | | | | | | | |
| | ORIG | DUP | | | | | | |
| Turbidity | 0.440 | 0.430 | NA | NA | NA | NA | 2 | 15 |



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HARDNESS
EPA 200.7/SM 2340B

Matrix: Water
 Units: mg eqt. CaCO₃/L (ppm)

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|-------------------|----------------------|-----|----------------|---------------|---------------|-------|
| Client ID: | COLM-20171112 | | | | | |
| Laboratory ID: | 11-147-01 | | | | | |
| Hardness | 12 | 1.0 | 200.7/SM 2340B | 11-16-17 | 11-17-17 | |

| | | | | | | |
|-------------------|-----------------------|-----|----------------|----------|----------|--|
| Client ID: | COUMI-20171112 | | | | | |
| Laboratory ID: | 11-147-02 | | | | | |
| Hardness | 62 | 1.0 | 200.7/SM 2340B | 11-16-17 | 11-17-17 | |

| | | | | | | |
|-------------------|-----------------------|-----|----------------|----------|----------|--|
| Client ID: | COUMO-20171112 | | | | | |
| Laboratory ID: | 11-147-03 | | | | | |
| Hardness | 56 | 1.0 | 200.7/SM 2340B | 11-16-17 | 11-17-17 | |

| | | | | | | |
|-------------------|-----------------------|-----|----------------|----------|----------|--|
| Client ID: | EVAMS-20171112 | | | | | |
| Laboratory ID: | 11-147-04 | | | | | |
| Hardness | 77 | 1.0 | 200.7/SM 2340B | 11-16-17 | 11-17-17 | |

| | | | | | | |
|-------------------|------------------------|-----|----------------|----------|----------|--|
| Client ID: | EVALSS-20171112 | | | | | |
| Laboratory ID: | 11-147-05 | | | | | |
| Hardness | 71 | 1.0 | 200.7/SM 2340B | 11-16-17 | 11-17-17 | |

| | | | | | | |
|-------------------|-----------------------|-----|----------------|----------|----------|--|
| Client ID: | MONMN-20171112 | | | | | |
| Laboratory ID: | 11-147-06 | | | | | |
| Hardness | 53 | 1.0 | 200.7/SM 2340B | 11-16-17 | 11-17-17 | |

| | | | | | | |
|-------------------|-----------------------|-----|----------------|----------|----------|--|
| Client ID: | MONMS-20171112 | | | | | |
| Laboratory ID: | 11-147-07 | | | | | |
| Hardness | 87 | 1.0 | 200.7/SM 2340B | 11-16-17 | 11-17-17 | |



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HARDNESS
EPA 200.7/SM 2340B

Matrix: Water
 Units: mg eqt. CaCO₃/L (ppm)

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|-------------------|----------------------|-----|----------------|---------------|---------------|-------|
| Client ID: | MONM-20171112 | | | | | |
| Laboratory ID: | 11-147-08 | | | | | |
| Hardness | 63 | 1.0 | 200.7/SM 2340B | 11-16-17 | 11-17-17 | |

| | | | | | | |
|-------------------|-----------------------|-----|----------------|----------|----------|--|
| Client ID: | SEIMN-20171112 | | | | | |
| Laboratory ID: | 11-147-09 | | | | | |
| Hardness | 28 | 1.0 | 200.7/SM 2340B | 11-16-17 | 11-17-17 | |

| | | | | | | |
|-------------------|-----------------------|-----|----------------|----------|----------|--|
| Client ID: | SEIMS-20171112 | | | | | |
| Laboratory ID: | 11-147-10 | | | | | |
| Hardness | 47 | 1.0 | 200.7/SM 2340B | 11-16-17 | 11-17-17 | |

| | | | | | | |
|-------------------|-----------------------|-----|----------------|----------|----------|--|
| Client ID: | TOSMI-20171112 | | | | | |
| Laboratory ID: | 11-147-11 | | | | | |
| Hardness | 48 | 1.0 | 200.7/SM 2340B | 11-16-17 | 11-17-17 | |

| | | | | | | |
|-------------------|-----------------------|-----|----------------|----------|----------|--|
| Client ID: | TOSMO-20171112 | | | | | |
| Laboratory ID: | 11-147-12 | | | | | |
| Hardness | 50 | 1.0 | 200.7/SM 2340B | 11-16-17 | 11-17-17 | |

| | | | | | | |
|-------------------|-----------------------|-----|----------------|----------|----------|--|
| Client ID: | TYLMI-20171112 | | | | | |
| Laboratory ID: | 11-147-13 | | | | | |
| Hardness | 49 | 1.0 | 200.7/SM 2340B | 11-16-17 | 11-17-17 | |

| | | | | | | |
|-------------------|-----------------------|-----|----------------|----------|----------|--|
| Client ID: | TYLMO-20171112 | | | | | |
| Laboratory ID: | 11-147-14 | | | | | |
| Hardness | 30 | 1.0 | 200.7/SM 2340B | 11-16-17 | 11-17-17 | |



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HARDNESS
EPA 200.7/SM 2340B

Matrix: Water
Units: mg eqt. CaCO₃/L (ppm)

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|-------------------|----------------------|------------|----------------|----------------------|----------------------|--------------|
| Client ID: | QA35-20171112 | | | | | |
| Laboratory ID: | 11-147-15 | | | | | |
| Hardness | 55 | 1.0 | 200.7/SM 2340B | 11-16-17 | 11-17-17 | |



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**HARDNESS
 EPA 200.7/SM 2340B
 QUALITY CONTROL**

Matrix: Water
 Units: mg eqt. CaCO₃/L (ppm)

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|---------------------|-----------|-----|----------------|---------------|---------------|-------|
| METHOD BLANK | | | | | | |
| Laboratory ID: | MB1116WH3 | | | | | |
| Hardness | ND | 1.0 | 200.7/SM 2340B | 11-16-17 | 11-17-17 | |

| Analyte | Result | Spike Level | Source Result | Percent Recovery | Recovery Limits | RPD | RPD Limit | Flags |
|------------------|-------------|-------------|---------------|------------------|-----------------|-----|-----------|-------|
| DUPLICATE | | | | | | | | |
| Laboratory ID: | 11-147-01 | | | | | | | |
| | ORIG | DUP | | | | | | |
| Hardness | 11.8 | 11.6 | NA | NA | NA | 2 | 20 | |

| Analyte | Result | Spike Level | Source Result | Percent Recovery | Recovery Limits | RPD | RPD Limit | Flags | | |
|----------------------|------------|-------------|---------------|------------------|-----------------|-----|-----------|--------|---|----|
| MATRIX SPIKES | | | | | | | | | | |
| Laboratory ID: | 11-147-01 | | | | | | | | | |
| | MS | MSD | MS | MSD | MS | MSD | | | | |
| Hardness | 144 | 149 | 132 | 132 | 11.8 | 100 | 104 | 75-125 | 3 | 20 |

| Analyte | Result | Spike Level | Source Result | Percent Recovery | Recovery Limits | RPD | RPD Limit | Flags |
|--------------------|------------|-------------|---------------|------------------|-----------------|-----|-----------|-------|
| SPIKE BLANK | | | | | | | | |
| Laboratory ID: | SB1116WH3 | | | | | | | |
| | SB | SB | | | SB | | | |
| Hardness | 134 | 132 | NA | 102 | 80-120 | NA | NA | |



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**DISSOLVED ORGANIC CARBON
 SM 5310B**

Matrix: Water
 Units: mg/L

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|--------------------------|------------------------|-----|----------|---------------|---------------|-------|
| Client ID: | COLM-20171112 | | | | | |
| Laboratory ID: | 11-147-01 | | | | | |
| Dissolved Organic Carbon | 13 | 1.0 | SM 5310B | 11-16-17 | 11-16-17 | |
| Client ID: | COUMI-20171112 | | | | | |
| Laboratory ID: | 11-147-02 | | | | | |
| Dissolved Organic Carbon | 9.4 | 1.0 | SM 5310B | 11-16-17 | 11-16-17 | |
| Client ID: | COUMO-20171112 | | | | | |
| Laboratory ID: | 11-147-03 | | | | | |
| Dissolved Organic Carbon | 7.0 | 1.0 | SM 5310B | 11-16-17 | 11-16-17 | |
| Client ID: | EVAMS-20171112 | | | | | |
| Laboratory ID: | 11-147-04 | | | | | |
| Dissolved Organic Carbon | 8.0 | 1.0 | SM 5310B | 11-16-17 | 11-16-17 | |
| Client ID: | EVALSS-20171112 | | | | | |
| Laboratory ID: | 11-147-05 | | | | | |
| Dissolved Organic Carbon | 7.9 | 1.0 | SM 5310B | 11-16-17 | 11-16-17 | |
| Client ID: | MONMN-20171112 | | | | | |
| Laboratory ID: | 11-147-06 | | | | | |
| Dissolved Organic Carbon | 5.6 | 1.0 | SM 5310B | 11-16-17 | 11-16-17 | |
| Client ID: | MONMS-20171112 | | | | | |
| Laboratory ID: | 11-147-07 | | | | | |
| Dissolved Organic Carbon | 7.5 | 1.0 | SM 5310B | 11-16-17 | 11-16-17 | |



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**DISSOLVED ORGANIC CARBON
 SM 5310B**

Matrix: Water
 Units: mg/L

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|--------------------------|-----------------------|-----|----------|---------------|---------------|-------|
| Client ID: | MONM-20171112 | | | | | |
| Laboratory ID: | 11-147-08 | | | | | |
| Dissolved Organic Carbon | 5.9 | 1.0 | SM 5310B | 11-16-17 | 11-16-17 | |
| Client ID: | SEIMN-20171112 | | | | | |
| Laboratory ID: | 11-147-09 | | | | | |
| Dissolved Organic Carbon | 8.7 | 1.0 | SM 5310B | 11-16-17 | 11-16-17 | |
| Client ID: | SEIMS-20171112 | | | | | |
| Laboratory ID: | 11-147-10 | | | | | |
| Dissolved Organic Carbon | 8.9 | 1.0 | SM 5310B | 11-16-17 | 11-16-17 | |
| Client ID: | TOSMI-20171112 | | | | | |
| Laboratory ID: | 11-147-11 | | | | | |
| Dissolved Organic Carbon | 6.2 | 1.0 | SM 5310B | 11-16-17 | 11-16-17 | |
| Client ID: | TOSMO-20171112 | | | | | |
| Laboratory ID: | 11-147-12 | | | | | |
| Dissolved Organic Carbon | 6.2 | 1.0 | SM 5310B | 11-16-17 | 11-16-17 | |
| Client ID: | TYLMI-20171112 | | | | | |
| Laboratory ID: | 11-147-13 | | | | | |
| Dissolved Organic Carbon | 6.6 | 1.0 | SM 5310B | 11-16-17 | 11-16-17 | |
| Client ID: | TYLMO-20171112 | | | | | |
| Laboratory ID: | 11-147-14 | | | | | |
| Dissolved Organic Carbon | 4.5 | 1.0 | SM 5310B | 11-16-17 | 11-16-17 | |



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**DISSOLVED ORGANIC CARBON
SM 5310B**

Matrix: Water
Units: mg/L

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|--------------------------|----------------------|------------|---------------|----------------------|----------------------|--------------|
| Client ID: | QA35-20171112 | | | | | |
| Laboratory ID: | 11-147-15 | | | | | |
| Dissolved Organic Carbon | 7.2 | 1.0 | SM 5310B | 11-16-17 | 11-16-17 | |



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**DISSOLVED ORGANIC CARBON
 SM 5310B
 QUALITY CONTROL**

Matrix: Water
 Units: mg/L

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|--------------------------|-----------|-----|----------|---------------|---------------|-------|
| METHOD BLANK | | | | | | |
| Laboratory ID: | MB1116D1 | | | | | |
| Dissolved Organic Carbon | ND | 1.0 | SM 5310B | 11-16-17 | 11-16-17 | |

| Analyte | Result | Spike Level | Source Result | Percent Recovery | Recovery Limits | RPD | RPD Limit | Flags |
|--------------------------|-------------|-------------|---------------|------------------|-----------------|-----|-----------|-------|
| DUPLICATE | | | | | | | | |
| Laboratory ID: | 11-147-01 | | | | | | | |
| | ORIG | DUP | | | | | | |
| Dissolved Organic Carbon | 13.1 | 13.1 | NA | NA | NA | 0 | 15 | |

MATRIX SPIKE

| | | | | | | | | |
|--------------------------|-------------|------|------|----|--------|----|----|--|
| Laboratory ID: | 11-147-01 | | | | | | | |
| | MS | MS | | MS | | | | |
| Dissolved Organic Carbon | 22.9 | 10.0 | 13.1 | 98 | 86-122 | NA | NA | |

SPIKE BLANK

| | | | | | | | | |
|--------------------------|-------------|------|----|-----|--------|----|----|--|
| Laboratory ID: | SB1116D1 | | | | | | | |
| | SB | SB | | SB | | | | |
| Dissolved Organic Carbon | 10.5 | 10.0 | NA | 105 | 99-118 | NA | NA | |



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TOTAL PHOSPHORUS
EPA 365.1

Matrix: Water
 Units: mg/L

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|-------------------|----------------------|-------|-----------|---------------|---------------|-------|
| Client ID: | COLM-20171112 | | | | | |
| Laboratory ID: | 11-147-01 | | | | | |
| Total Phosphorus | 0.014 | 0.010 | EPA 365.1 | 11-17-17 | 11-17-17 | |

| | | | | | | |
|-------------------|-----------------------|-------|-----------|----------|----------|--|
| Client ID: | COUMI-20171112 | | | | | |
| Laboratory ID: | 11-147-02 | | | | | |
| Total Phosphorus | 0.12 | 0.010 | EPA 365.1 | 11-17-17 | 11-17-17 | |

| | | | | | | |
|-------------------|-----------------------|-------|-----------|----------|----------|--|
| Client ID: | COUMO-20171112 | | | | | |
| Laboratory ID: | 11-147-03 | | | | | |
| Total Phosphorus | 0.061 | 0.010 | EPA 365.1 | 11-17-17 | 11-17-17 | |

| | | | | | | |
|-------------------|-----------------------|-------|-----------|----------|----------|--|
| Client ID: | EVAMS-20171112 | | | | | |
| Laboratory ID: | 11-147-04 | | | | | |
| Total Phosphorus | 0.017 | 0.010 | EPA 365.1 | 11-17-17 | 11-17-17 | |

| | | | | | | |
|-------------------|------------------------|-------|-----------|----------|----------|--|
| Client ID: | EVALSS-20171112 | | | | | |
| Laboratory ID: | 11-147-05 | | | | | |
| Total Phosphorus | 0.013 | 0.010 | EPA 365.1 | 11-17-17 | 11-17-17 | |

| | | | | | | |
|-------------------|-----------------------|-------|-----------|----------|----------|--|
| Client ID: | MONMN-20171112 | | | | | |
| Laboratory ID: | 11-147-06 | | | | | |
| Total Phosphorus | 0.027 | 0.010 | EPA 365.1 | 11-17-17 | 11-17-17 | |

| | | | | | | |
|-------------------|-----------------------|-------|-----------|----------|----------|--|
| Client ID: | MONMS-20171112 | | | | | |
| Laboratory ID: | 11-147-07 | | | | | |
| Total Phosphorus | 0.026 | 0.010 | EPA 365.1 | 11-17-17 | 11-17-17 | |



Date of Report: November 28, 2017
 Samples Submitted: November 13, 2017
 Laboratory Reference: 1711-147
 Project: 14-05806-000

TOTAL PHOSPHORUS
EPA 365.1

Matrix: Water
 Units: mg/L

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|-------------------|----------------------|-------|-----------|---------------|---------------|-------|
| Client ID: | MONM-20171112 | | | | | |
| Laboratory ID: | 11-147-08 | | | | | |
| Total Phosphorus | 0.033 | 0.010 | EPA 365.1 | 11-17-17 | 11-17-17 | |

| | | | | | | |
|-------------------|-----------------------|-------|-----------|----------|----------|--|
| Client ID: | SEIMN-20171112 | | | | | |
| Laboratory ID: | 11-147-09 | | | | | |
| Total Phosphorus | 0.039 | 0.010 | EPA 365.1 | 11-17-17 | 11-17-17 | |

| | | | | | | |
|-------------------|-----------------------|-------|-----------|----------|----------|--|
| Client ID: | SEIMS-20171112 | | | | | |
| Laboratory ID: | 11-147-10 | | | | | |
| Total Phosphorus | 0.034 | 0.010 | EPA 365.1 | 11-17-17 | 11-17-17 | |

| | | | | | | |
|-------------------|-----------------------|-------|-----------|----------|----------|--|
| Client ID: | TOSMI-20171112 | | | | | |
| Laboratory ID: | 11-147-11 | | | | | |
| Total Phosphorus | 0.096 | 0.010 | EPA 365.1 | 11-17-17 | 11-17-17 | |

| | | | | | | |
|-------------------|-----------------------|-------|-----------|----------|----------|--|
| Client ID: | TOSMO-20171112 | | | | | |
| Laboratory ID: | 11-147-12 | | | | | |
| Total Phosphorus | 0.095 | 0.010 | EPA 365.1 | 11-17-17 | 11-17-17 | |

| | | | | | | |
|-------------------|-----------------------|-------|-----------|----------|----------|--|
| Client ID: | TYLMI-20171112 | | | | | |
| Laboratory ID: | 11-147-13 | | | | | |
| Total Phosphorus | 0.033 | 0.010 | EPA 365.1 | 11-17-17 | 11-17-17 | |

| | | | | | | |
|-------------------|-----------------------|-------|-----------|----------|----------|--|
| Client ID: | TYLMO-20171112 | | | | | |
| Laboratory ID: | 11-147-14 | | | | | |
| Total Phosphorus | 0.042 | 0.010 | EPA 365.1 | 11-17-17 | 11-17-17 | |



Date of Report: November 28, 2017
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Project: 14-05806-000

TOTAL PHOSPHORUS
EPA 365.1

Matrix: Water
Units: mg/L

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|-------------------|----------------------|------------|---------------|----------------------|----------------------|--------------|
| Client ID: | QA35-20171112 | | | | | |
| Laboratory ID: | 11-147-15 | | | | | |
| Total Phosphorus | 0.064 | 0.010 | EPA 365.1 | 11-17-17 | 11-17-17 | |



Date of Report: November 28, 2017
 Samples Submitted: November 13, 2017
 Laboratory Reference: 1711-147
 Project: 14-05806-000

**TOTAL PHOSPHORUS
 EPA 365.1
 QUALITY CONTROL**

Matrix: Water
 Units: mg/L

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|---------------------|-----------|-------|-----------|---------------|---------------|-------|
| METHOD BLANK | | | | | | |
| Laboratory ID: | MB1117W1 | | | | | |
| Total Phosphorus | ND | 0.010 | EPA 365.1 | 11-17-17 | 11-17-17 | |

| Analyte | Result | Spike Level | Source Result | Percent Recovery | Recovery Limits | RPD | RPD Limit | Flags |
|------------------|---------------|---------------|---------------|------------------|-----------------|-----|-----------|-------|
| DUPLICATE | | | | | | | | |
| Laboratory ID: | 11-147-01 | | | | | | | |
| | ORIG | DUP | | | | | | |
| Total Phosphorus | 0.0143 | 0.0115 | NA | NA | NA | 22 | 11 | C |

| | | | | | | | | |
|---------------------|--------------|-------|--------|----|--------|----|----|--|
| MATRIX SPIKE | | | | | | | | |
| Laboratory ID: | 11-147-01 | | | | | | | |
| | MS | MS | | MS | | | | |
| Total Phosphorus | 0.263 | 0.250 | 0.0143 | 99 | 82-124 | NA | NA | |

| | | | | | | | | |
|--------------------|--------------|-------|----|----|--------|----|----|--|
| SPIKE BLANK | | | | | | | | |
| Laboratory ID: | SB1117W1 | | | | | | | |
| | SB | SB | | SB | | | | |
| Total Phosphorus | 0.233 | 0.250 | NA | 93 | 87-114 | NA | NA | |



Date of Report: November 28, 2017
 Samples Submitted: November 13, 2017
 Laboratory Reference: 1711-147
 Project: 14-05806-000

**TOTAL METALS
 EPA 200.8**

Matrix: Water
 Units: ug/L (ppb)

| Analyte | Result | PQL | EPA Method | Date Prepared | Date Analyzed | Flags |
|-----------------------------------|--------|-----|------------|---------------|---------------|-------|
| Lab ID: 11-147-01 | | | | | | |
| Client ID: COLM-20171112 | | | | | | |
| Copper | ND | 1.0 | 200.8 | 11-16-17 | 11-17-17 | |
| Zinc | ND | 5.0 | 200.8 | 11-16-17 | 11-17-17 | |
| Lab ID: 11-147-02 | | | | | | |
| Client ID: COUMI-20171112 | | | | | | |
| Copper | 3.9 | 1.0 | 200.8 | 11-16-17 | 11-17-17 | |
| Zinc | 39 | 5.0 | 200.8 | 11-16-17 | 11-17-17 | |
| Lab ID: 11-147-03 | | | | | | |
| Client ID: COUMO-20171112 | | | | | | |
| Copper | 4.5 | 1.0 | 200.8 | 11-16-17 | 11-17-17 | |
| Zinc | 37 | 5.0 | 200.8 | 11-16-17 | 11-17-17 | |
| Lab ID: 11-147-04 | | | | | | |
| Client ID: EVAMS-20171112 | | | | | | |
| Copper | ND | 1.0 | 200.8 | 11-16-17 | 11-17-17 | |
| Zinc | ND | 5.0 | 200.8 | 11-16-17 | 11-17-17 | |
| Lab ID: 11-147-05 | | | | | | |
| Client ID: EVALSS-20171112 | | | | | | |
| Copper | ND | 1.0 | 200.8 | 11-16-17 | 11-17-17 | |
| Zinc | 10 | 5.0 | 200.8 | 11-16-17 | 11-17-17 | |
| Lab ID: 11-147-06 | | | | | | |
| Client ID: MONMN-20171112 | | | | | | |
| Copper | 1.1 | 1.0 | 200.8 | 11-16-17 | 11-17-17 | |
| Zinc | 5.3 | 5.0 | 200.8 | 11-16-17 | 11-17-17 | |



Date of Report: November 28, 2017
 Samples Submitted: November 13, 2017
 Laboratory Reference: 1711-147
 Project: 14-05806-000

TOTAL METALS
EPA 200.8

Matrix: Water
 Units: ug/L (ppb)

| Analyte | Result | PQL | EPA Method | Date Prepared | Date Analyzed | Flags |
|-------------------|-----------------------|------------|-------------------|----------------------|----------------------|--------------|
| Lab ID: | 11-147-07 | | | | | |
| Client ID: | MONMS-20171112 | | | | | |
| Copper | 2.3 | 1.0 | 200.8 | 11-16-17 | 11-17-17 | |
| Zinc | ND | 5.0 | 200.8 | 11-16-17 | 11-17-17 | |
| Lab ID: | 11-147-08 | | | | | |
| Client ID: | MONM-20171112 | | | | | |
| Copper | 1.5 | 1.0 | 200.8 | 11-16-17 | 11-17-17 | |
| Zinc | 8.7 | 5.0 | 200.8 | 11-16-17 | 11-17-17 | |
| Lab ID: | 11-147-09 | | | | | |
| Client ID: | SEIMN-20171112 | | | | | |
| Copper | ND | 1.0 | 200.8 | 11-16-17 | 11-17-17 | |
| Zinc | ND | 5.0 | 200.8 | 11-16-17 | 11-17-17 | |
| Lab ID: | 11-147-10 | | | | | |
| Client ID: | SEIMS-20171112 | | | | | |
| Copper | 1.6 | 1.0 | 200.8 | 11-16-17 | 11-17-17 | |
| Zinc | ND | 5.0 | 200.8 | 11-16-17 | 11-17-17 | |
| Lab ID: | 11-147-11 | | | | | |
| Client ID: | TOSMI-20171112 | | | | | |
| Copper | 7.5 | 1.0 | 200.8 | 11-16-17 | 11-17-17 | |
| Zinc | 42 | 5.0 | 200.8 | 11-16-17 | 11-17-17 | |
| Lab ID: | 11-147-12 | | | | | |
| Client ID: | TOSMO-20171112 | | | | | |
| Copper | 4.8 | 1.0 | 200.8 | 11-16-17 | 11-17-17 | |
| Zinc | 26 | 5.0 | 200.8 | 11-16-17 | 11-17-17 | |



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 Samples Submitted: November 13, 2017
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 Project: 14-05806-000

TOTAL METALS
EPA 200.8

Matrix: Water
 Units: ug/L (ppb)

| Analyte | Result | PQL | EPA Method | Date Prepared | Date Analyzed | Flags |
|-------------------|-----------------------|------------|-------------------|----------------------|----------------------|--------------|
| Lab ID: | 11-147-13 | | | | | |
| Client ID: | TYLMI-20171112 | | | | | |
| Copper | 4.1 | 1.0 | 200.8 | 11-16-17 | 11-17-17 | |
| Zinc | 5.5 | 5.0 | 200.8 | 11-16-17 | 11-17-17 | |

| | | | | | | |
|-------------------|-----------------------|-----|-------|----------|----------|--|
| Lab ID: | 11-147-14 | | | | | |
| Client ID: | TYLMO-20171112 | | | | | |
| Copper | 3.9 | 1.0 | 200.8 | 11-16-17 | 11-17-17 | |
| Zinc | 11 | 5.0 | 200.8 | 11-16-17 | 11-17-17 | |

| | | | | | | |
|-------------------|----------------------|-----|-------|----------|----------|--|
| Lab ID: | 11-147-15 | | | | | |
| Client ID: | QA35-20171112 | | | | | |
| Copper | 4.3 | 1.0 | 200.8 | 11-16-17 | 11-17-17 | |
| Zinc | 34 | 5.0 | 200.8 | 11-16-17 | 11-17-17 | |



Date of Report: November 28, 2017
Samples Submitted: November 13, 2017
Laboratory Reference: 1711-147
Project: 14-05806-000

**TOTAL METALS
EPA 200.8
METHOD BLANK QUALITY CONTROL**

Date Extracted: 11-16-17
Date Analyzed: 11-17-17

Matrix: Water
Units: ug/L (ppb)

Lab ID: MB1116WH2

| Analyte | Method | Result | PQL |
|---------|--------|-----------|-----|
| Copper | 200.8 | ND | 1.0 |
| Zinc | 200.8 | ND | 5.0 |



Date of Report: November 28, 2017
Samples Submitted: November 13, 2017
Laboratory Reference: 1711-147
Project: 14-05806-000

**TOTAL METALS
EPA 200.8
DUPLICATE QUALITY CONTROL**

Date Extracted: 11-16-17
Date Analyzed: 11-17-17

Matrix: Water
Units: ug/L (ppb)

Lab ID: 11-147-04

| Analyte | Sample Result | Duplicate Result | RPD | PQL | Flags |
|---------|---------------|------------------|-----|-----|-------|
| Copper | ND | ND | NA | 1.0 | |
| Zinc | ND | ND | NA | 5.0 | |



Date of Report: November 28, 2017
 Samples Submitted: November 13, 2017
 Laboratory Reference: 1711-147
 Project: 14-05806-000

**TOTAL METALS
 EPA 200.8
 MS/MSD QUALITY CONTROL**

Date Extracted: 11-16-17

Date Analyzed: 11-17-17

Matrix: Water

Units: ug/L (ppb)

Lab ID: 11-147-04

| Analyte | Spike Level | MS | Percent Recovery | MSD | Percent Recovery | RPD | Flags |
|---------|-------------|------------|------------------|------------|------------------|-----|-------|
| Copper | 100 | 102 | 102 | 105 | 105 | 2 | |
| Zinc | 100 | 106 | 106 | 107 | 107 | 1 | |



Date of Report: November 28, 2017
 Samples Submitted: November 13, 2017
 Laboratory Reference: 1711-147
 Project: 14-05806-000

**DISSOLVED METALS
 EPA 200.8**

Matrix: Water
 Units: ug/L (ppb)

| Analyte | Result | PQL | EPA Method | Date Prepared | Date Analyzed | Flags |
|-----------------------------------|---------------|------------|-------------------|----------------------|----------------------|--------------|
| Lab ID: 11-147-01 | | | | | | |
| Client ID: COLM-20171112 | | | | | | |
| Copper | ND | 1.0 | 200.8 | | 11-15-17 | |
| Zinc | ND | 5.0 | 200.8 | | 11-15-17 | |
| Lab ID: 11-147-02 | | | | | | |
| Client ID: COUMI-20171112 | | | | | | |
| Copper | 2.0 | 1.0 | 200.8 | | 11-15-17 | |
| Zinc | 20 | 5.0 | 200.8 | | 11-15-17 | |
| Lab ID: 11-147-03 | | | | | | |
| Client ID: COUMO-20171112 | | | | | | |
| Copper | 2.5 | 1.0 | 200.8 | | 11-15-17 | |
| Zinc | 28 | 5.0 | 200.8 | | 11-15-17 | |
| Lab ID: 11-147-04 | | | | | | |
| Client ID: EVAMS-20171112 | | | | | | |
| Copper | ND | 1.0 | 200.8 | | 11-15-17 | |
| Zinc | ND | 5.0 | 200.8 | | 11-15-17 | |
| Lab ID: 11-147-05 | | | | | | |
| Client ID: EVALSS-20171112 | | | | | | |
| Copper | ND | 1.0 | 200.8 | | 11-15-17 | |
| Zinc | 8.2 | 5.0 | 200.8 | | 11-15-17 | |
| Lab ID: 11-147-06 | | | | | | |
| Client ID: MONMN-20171112 | | | | | | |
| Copper | ND | 1.0 | 200.8 | | 11-15-17 | |
| Zinc | ND | 5.0 | 200.8 | | 11-15-17 | |



OnSite Environmental, Inc. 14648 NE 95th Street, Redmond, WA 98052 (425) 883-3881

This report pertains to the samples analyzed in accordance with the chain of custody, and is intended only for the use of the individual or company to whom it is addressed.

Date of Report: November 28, 2017
 Samples Submitted: November 13, 2017
 Laboratory Reference: 1711-147
 Project: 14-05806-000

**DISSOLVED METALS
 EPA 200.8**

Matrix: Water
 Units: ug/L (ppb)

| Analyte | Result | PQL | EPA Method | Date Prepared | Date Analyzed | Flags |
|-------------------|-----------------------|-----|------------|---------------|---------------|-------|
| Lab ID: | 11-147-07 | | | | | |
| Client ID: | MONMS-20171112 | | | | | |
| Copper | 2.3 | 1.0 | 200.8 | | 11-15-17 | |
| Zinc | ND | 5.0 | 200.8 | | 11-15-17 | |
| Lab ID: | 11-147-08 | | | | | |
| Client ID: | MONM-20171112 | | | | | |
| Copper | 1.0 | 1.0 | 200.8 | | 11-15-17 | |
| Zinc | 6.5 | 5.0 | 200.8 | | 11-15-17 | |
| Lab ID: | 11-147-09 | | | | | |
| Client ID: | SEIMN-20171112 | | | | | |
| Copper | ND | 1.0 | 200.8 | | 11-15-17 | |
| Zinc | ND | 5.0 | 200.8 | | 11-15-17 | |
| Lab ID: | 11-147-10 | | | | | |
| Client ID: | SEIMS-20171112 | | | | | |
| Copper | ND | 1.0 | 200.8 | | 11-15-17 | |
| Zinc | ND | 5.0 | 200.8 | | 11-15-17 | |
| Lab ID: | 11-147-11 | | | | | |
| Client ID: | TOSMI-20171112 | | | | | |
| Copper | 3.6 | 1.0 | 200.8 | | 11-15-17 | |
| Zinc | 21 | 5.0 | 200.8 | | 11-15-17 | |
| Lab ID: | 11-147-12 | | | | | |
| Client ID: | TOSMO-20171112 | | | | | |
| Copper | 2.4 | 1.0 | 200.8 | | 11-15-17 | |
| Zinc | 7.4 | 5.0 | 200.8 | | 11-15-17 | |



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**DISSOLVED METALS
 EPA 200.8**

Matrix: Water
 Units: ug/L (ppb)

| Analyte | Result | PQL | EPA Method | Date Prepared | Date Analyzed | Flags |
|-------------------|-----------------------|-----|------------|---------------|---------------|-------|
| Lab ID: | 11-147-13 | | | | | |
| Client ID: | TYLMI-20171112 | | | | | |
| Copper | 14 | 1.0 | 200.8 | | 11-15-17 | |
| Zinc | 12 | 5.0 | 200.8 | | 11-15-17 | |
| Lab ID: | 11-147-14 | | | | | |
| Client ID: | TYLMO-20171112 | | | | | |
| Copper | 2.2 | 1.0 | 200.8 | | 11-15-17 | |
| Zinc | 5.2 | 5.0 | 200.8 | | 11-15-17 | |
| Lab ID: | 11-147-15 | | | | | |
| Client ID: | QA35-20171112 | | | | | |
| Copper | 2.5 | 1.0 | 200.8 | | 11-15-17 | |
| Zinc | 28 | 5.0 | 200.8 | | 11-15-17 | |



Date of Report: November 28, 2017
Samples Submitted: November 13, 2017
Laboratory Reference: 1711-147
Project: 14-05806-000

**DISSOLVED METALS
EPA 200.8
METHOD BLANK QUALITY CONTROL**

Date Analyzed: 11-15-17

Matrix: Water
Units: ug/L (ppb)

Lab ID: MB1109F1

| Analyte | Method | Result | PQL |
|---------|--------|-----------|-----|
| Copper | 200.8 | ND | 1.0 |
| Zinc | 200.8 | ND | 5.0 |



Date of Report: November 28, 2017
Samples Submitted: November 13, 2017
Laboratory Reference: 1711-147
Project: 14-05806-000

**DISSOLVED METALS
EPA 200.8
DUPLICATE QUALITY CONTROL**

Date Analyzed: 11-15-17

Matrix: Water
Units: ug/L (ppb)

Lab ID: 11-131-02

| Analyte | Sample Result | Duplicate Result | RPD | PQL | Flags |
|---------|------------------|---------------------|-----|-----|-------|
| Copper | 7.64 | 8.14 | 6 | 1.0 | |
| Zinc | ND | ND | NA | 5.0 | |



Date of Report: November 28, 2017
 Samples Submitted: November 13, 2017
 Laboratory Reference: 1711-147
 Project: 14-05806-000

**DISSOLVED METALS
 EPA 200.8
 MS/MSD QUALITY CONTROL**

Date Analyzed: 11-15-17

Matrix: Water
 Units: ug/L (ppb)

Lab ID: 11-131-02

| Analyte | Spike Level | MS | Percent Recovery | MSD | Percent Recovery | RPD | Flags |
|---------|-------------|-------------|------------------|-------------|------------------|-----|-------|
| Copper | 80.0 | 82.8 | 94 | 79.6 | 90 | 4 | |
| Zinc | 80.0 | 75.6 | 95 | 74.8 | 94 | 1 | |





Data Qualifiers and Abbreviations

- A - Due to a high sample concentration, the amount spiked is insufficient for meaningful MS/MSD recovery data.
 - B - The analyte indicated was also found in the blank sample.
 - C - The duplicate RPD is outside control limits due to high result variability when analyte concentrations are within five times the quantitation limit.
 - E - The value reported exceeds the quantitation range and is an estimate.
 - F - Surrogate recovery data is not available due to the high concentration of coeluting target compounds.
 - H - The analyte indicated is a common laboratory solvent and may have been introduced during sample preparation, and be impacting the sample result.
 - I - Compound recovery is outside of the control limits.
 - J - The value reported was below the practical quantitation limit. The value is an estimate.
 - K - Sample duplicate RPD is outside control limits due to sample inhomogeneity. The sample was re-extracted and re-analyzed with similar results.
 - L - The RPD is outside of the control limits.
 - M - Hydrocarbons in the gasoline range are impacting the diesel range result.
 - M1 - Hydrocarbons in the gasoline range (toluene-naphthalene) are present in the sample.
 - N - Hydrocarbons in the lube oil range are impacting the diesel range result.
 - N1 - Hydrocarbons in diesel range are impacting lube oil range results.
 - O - Hydrocarbons indicative of heavier fuels are present in the sample and are impacting the gasoline result.
 - P - The RPD of the detected concentrations between the two columns is greater than 40.
 - Q - Surrogate recovery is outside of the control limits.
 - S - Surrogate recovery data is not available due to the necessary dilution of the sample.
 - T - The sample chromatogram is not similar to a typical _____.
 - U - The analyte was analyzed for, but was not detected above the reported sample quantitation limit.
 - U1 - The practical quantitation limit is elevated due to interferences present in the sample.
 - V - Matrix Spike/Matrix Spike Duplicate recoveries are outside control limits due to matrix effects.
 - W - Matrix Spike/Matrix Spike Duplicate RPD are outside control limits due to matrix effects.
 - X - Sample extract treated with a mercury cleanup procedure.
 - X1 - Sample extract treated with a sulfuric acid/silica gel cleanup procedure.
 - Y - The calibration verification for this analyte exceeded the 20% drift specified in method 8260C, and therefore the reported result should be considered an estimate. The overall performance of the calibration verification standard met the acceptance criteria of the method.
 - Z -
- ND - Not Detected at PQL
 PQL - Practical Quantitation Limit
 RPD - Relative Percent Difference





Am Test Inc.
13600 NE 126TH PL
Suite C
Kirkland, WA 98034
(425) 885-1664

**Professional
Analytical
Services**

Nov 27 2017
On-Site Environmental
14648 NE 95th ST
Redmond, WA 98052
Attention: David Baumeister

Dear David Baumeister:

Enclosed please find the analytical data for your REDMOND PAIRED WATERSHED STUDY project.

The following is a cross correlation of client and laboratory identifications for your convenience.

| CLIENT ID | MATRIX | AMTEST ID | TEST |
|-----------------|--------|------------|------------|
| TOSMI-20171112 | Water | 17-A019846 | Micro, NUT |
| TOSMO-20171112 | Water | 17-A019847 | Micro, NUT |
| TYLMI-20171118 | Water | 17-A019848 | Micro, NUT |
| TYLMO-20171118 | Water | 17-A019849 | Micro, NUT |
| QA-35-20171112 | Water | 17-A019850 | Micro, NUT |
| COLM-20171112 | Water | 17-A019851 | Micro, NUT |
| COUMI-20171112 | Water | 17-A019852 | Micro, NUT |
| COUMO-20171112 | Water | 17-A019853 | Micro, NUT |
| EVAMS-20171112 | Water | 17-A019854 | Micro, NUT |
| EVALSS-20171112 | Water | 17-A019855 | Micro, NUT |
| MONMN-20171112 | Water | 17-A019856 | Micro, NUT |
| MONMS-20171112 | Water | 17-A019857 | Micro, NUT |
| MONM-20171112 | Water | 17-A019858 | Micro, NUT |
| SEIMN-20171112 | Water | 17-A019859 | Micro, NUT |
| SEIMS-20171112 | Water | 17-A019860 | Micro, NUT |

Your samples were received on Monday, November 13, 2017. At the time of receipt, the samples were logged in and properly maintained prior to the subsequent analysis.

The analytical procedures used at AmTest are well documented and are typically derived from the protocols of the EPA, USDA, FDA or the Army Corps of Engineers.

Following the analytical data you will find the Quality Control (QC) results.

Please note that the detection limits that are listed in the body of the report refer to the Practical Quantitation Limits (PQL's), as opposed to the Method Detection Limits (MDL's).

Am Test Inc.
13600 NE 126TH PL
Suite C
Kirkland, WA 98034
(425) 885-1664

**Professional
Analytical
Services**

Nov 27 2017
On-Site Environmental
continued . . .

If you should have any questions pertaining to the data package, please feel free to contact me.

Sincerely,


Aaron W. Young
Laboratory Manager

Project #: 14-05806-000
PO Number: 11-147

BACT = Bacteriological
CONV = Conventionals

MET = Metals
ORG = Organics

NUT=Nutrients
DEM=Demand

MIN=Minerals

Am Test Inc.
13600 NE 126TH PL
Suite C
Kirkland, WA 98034
(425) 885-1664
www.amtestlab.com



*Professional
Analytical
Services*

ANALYSIS REPORT

On-Site Environmental
14648 NE 95th ST
Redmond, WA 98052
Attention: David Baumeister
Project Name: REDMOND PAIRED WATERSHED STUDY
Project #: 14-05806-000
PO Number: 14-05806-000
All results reported on an as received basis.

Date Received: 11/13/17
Date Reported: 11/27/17

AMTEST Identification Number 17-A019846
Client Identification TOSMI-20171112
Sampling Date 11/12/17, 18:15

Results

| PARAMETER | RESULT | UNITS | Q | D.L. | METHOD | ANALYST | DATE |
|--------------------------|--------|------------|---|------|-----------|---------|----------|
| Fecal Coliform | 5000 | CFU/100 ml | | 1 | SM 9222D | JM | 11/13/17 |
| Total Nitrogen (NOX&TKN) | 1.39 | mg/l | | 0.1 | | | |
| Total Nitrogen (TKN) | 0.759 | mg/l | | 0.1 | SM4500N | JC | 11/21/17 |
| Nitrate + Nitrite | 0.63 | mg/l | | 0.01 | SM4500NO3 | JC | 11/20/17 |

AMTEST Identification Number 17-A019847
Client Identification TOSMO-20171112
Sampling Date 11/12/17, 19:20

Results

| PARAMETER | RESULT | UNITS | Q | D.L. | METHOD | ANALYST | DATE |
|--------------------------|--------|------------|---|------|-----------|---------|----------|
| Fecal Coliform | 3500 | CFU/100 ml | | 1 | SM 9222D | JM | 11/13/17 |
| Total Nitrogen (NOX&TKN) | 0.99 | mg/l | | 0.1 | | | |
| Total Nitrogen (TKN) | 0.593 | mg/l | | 0.1 | SM4500N | JC | 11/21/17 |
| Nitrate + Nitrite | 0.40 | mg/l | | 0.01 | SM4500NO3 | JC | 11/20/17 |

AMTEST Identification Number 17-A019848
Client Identification TYLMI-20171118
Sampling Date 11/12/17, 20:10

Results

| PARAMETER | RESULT | UNITS | Q | D.L. | METHOD | ANALYST | DATE |
|--------------------------|--------|------------|---|------|-----------|---------|----------|
| Fecal Coliform | 90. | CFU/100 ml | | 1 | SM 9222D | JM | 11/13/17 |
| Total Nitrogen (NOX&TKN) | 0.98 | mg/l | | 0.1 | | | |
| Total Nitrogen (TKN) | 0.595 | mg/l | | 0.1 | SM4500N | JC | 11/21/17 |
| Nitrate + Nitrite | 0.38 | mg/l | | 0.01 | SM4500NO3 | JC | 11/20/17 |

AMTEST Identification Number 17-A019849
Client Identification TYLMO-20171118
Sampling Date 11/12/17, 19:50

Results

| PARAMETER | RESULT | UNITS | Q | D.L. | METHOD | ANALYST | DATE |
|--------------------------|--------|------------|---|------|-----------|---------|----------|
| Fecal Coliform | 280 | CFU/100 ml | | 1 | SM 9222D | JM | 11/13/17 |
| Total Nitrogen (NOX&TKN) | 0.67 | mg/l | | 0.1 | | | |
| Total Nitrogen (TKN) | 0.509 | mg/l | | 0.1 | SM4500N | JC | 11/21/17 |
| Nitrate + Nitrite | 0.16 | mg/l | | 0.01 | SM4500NO3 | JC | 11/20/17 |

AMTEST Identification Number 17-A019850
Client Identification QA-35-20171112
Sampling Date 11/12/17, 18:00

Results

| PARAMETER | RESULT | UNITS | Q | D.L. | METHOD | ANALYST | DATE |
|--------------------------|--------|------------|---|------|-----------|---------|----------|
| Fecal Coliform | 450 | CFU/100 ml | | 1 | SM 9222D | JM | 11/13/17 |
| Total Nitrogen (NOX&TKN) | 1.03 | mg/l | | 0.1 | | | |
| Total Nitrogen (TKN) | 0.698 | mg/l | | 0.1 | SM4500N | JC | 11/21/17 |
| Nitrate + Nitrite | 0.33 | mg/l | | 0.01 | SM4500NO3 | JC | 11/20/17 |

AMTEST Identification Number 17-A019851
Client Identification COLM-20171112
Sampling Date 11/12/17, 21:05

Microbiological

| PARAMETER | RESULT | UNITS | Q | D.L. | METHOD | ANALYST | DATE / TIME |
|----------------|--------|------------|---|------|----------|---------|----------------|
| Fecal Coliform | 20. | CFU/100 ml | | 1 | SM 9222D | JM | 11/13/17 16:00 |

Nutrients

| PARAMETER | RESULT | UNITS | Q | D.L. | METHOD | ANALYST | DATE |
|--------------------------|--------|-------|---|------|-----------|---------|----------|
| Total Nitrogen (NOX&TKN) | 1.02 | mg/l | | 0.1 | | | |
| Total Nitrogen (TKN) | 0.725 | mg/l | | 0.1 | EPA 351.2 | JC | 11/21/17 |
| Nitrate + Nitrite | 0.29 | mg/l | | 0.01 | EPA 353.2 | JC | 11/20/17 |

On-Site Environmental
Project Name: RDMOND PAIRED WATERSHED STUDY
AmTest ID: 17-A019852

AMTEST Identification Number 17-A019852
Client Identification COUMI-20171112
Sampling Date 11/12/17, 18:50

Microbiological

| PARAMETER | RESULT | UNITS | Q | D.L. | METHOD | ANALYST | DATE / TIME |
|----------------|--------|------------|---|------|----------|---------|----------------|
| Fecal Coliform | 400 | CFU/100 ml | | 1 | SM 9222D | JM | 11/13/17 16:00 |

Nutrients

| PARAMETER | RESULT | UNITS | Q | D.L. | METHOD | ANALYST | DATE |
|--------------------------|--------|-------|---|------|-----------|---------|----------|
| Total Nitrogen (NOX&TKN) | 0.86 | mg/l | | 0.1 | | | |
| Total Nitrogen (TKN) | 0.775 | mg/l | | 0.1 | EPA 351.2 | JC | 11/21/17 |
| Nitrate + Nitrite | 0.080 | mg/l | | 0.01 | EPA 353.2 | JC | 11/20/17 |

On-Site Environmental
Project Name: RDMOND PAIRED WATERSHED STUDY
AmTest ID: 17-A019853

AMTEST Identification Number 17-A019853
Client Identification COUMO-20171112
Sampling Date 11/12/17, 18:30

Microbiological

| PARAMETER | RESULT | UNITS | Q | D.L. | METHOD | ANALYST | DATE / TIME |
|----------------|--------|------------|---|------|----------|---------|----------------|
| Fecal Coliform | 570 | CFU/100 ml | | 1 | SM 9222D | JM | 11/13/17 16:00 |

Nutrients

| PARAMETER | RESULT | UNITS | Q | D.L. | METHOD | ANALYST | DATE |
|--------------------------|--------|-------|---|------|-----------|---------|----------|
| Total Nitrogen (NOX&TKN) | 0.87 | mg/l | | 0.1 | | | |
| Total Nitrogen (TKN) | 0.614 | mg/l | | 0.1 | EPA 351.2 | JC | 11/21/17 |
| Nitrate + Nitrite | 0.26 | mg/l | | 0.01 | EPA 353.2 | JC | 11/20/17 |

On-Site Environmental
Project Name: RDMOND PAIRED WATERSHED STUDY
AmTest ID: 17-A019854

AMTEST Identification Number 17-A019854
Client Identification EVAMS-20171112
Sampling Date 11/12/17, 18:50

Microbiological

| PARAMETER | RESULT | UNITS | Q | D.L. | METHOD | ANALYST | DATE / TIME |
|----------------|--------|------------|---|------|----------|---------|----------------|
| Fecal Coliform | 50. | CFU/100 ml | | 1 | SM 9222D | JM | 11/13/17 16:00 |

Nutrients

| PARAMETER | RESULT | UNITS | Q | D.L. | METHOD | ANALYST | DATE |
|--------------------------|--------|-------|---|------|-----------|---------|----------|
| Total Nitrogen (NOX&TKN) | 1.77 | mg/l | | 0.1 | | | |
| Total Nitrogen (TKN) | 0.571 | mg/l | | 0.1 | EPA 351.2 | JC | 11/21/17 |
| Nitrate + Nitrite | 1.2 | mg/l | | 0.01 | EPA 353.2 | JC | 11/20/17 |

AMTEST Identification Number 17-A019855
Client Identification EVALSS-20171112
Sampling Date 11/12/17, 19:15

Microbiological

| PARAMETER | RESULT | UNITS | Q | D.L. | METHOD | ANALYST | DATE / TIME |
|----------------|--------|------------|---|------|----------|---------|----------------|
| Fecal Coliform | 50. | CFU/100 ml | | 1 | SM 9222D | JM | 11/13/17 16:00 |

Nutrients

| PARAMETER | RESULT | UNITS | Q | D.L. | METHOD | ANALYST | DATE |
|--------------------------|--------|-------|---|------|-----------|---------|----------|
| Total Nitrogen (NOX&TKN) | 1.52 | mg/l | | 0.1 | | | |
| Total Nitrogen (TKN) | 0.524 | mg/l | | 0.1 | EPA 351.2 | JC | 11/21/17 |
| Nitrate + Nitrite | 1.0 | mg/l | | 0.01 | EPA 353.2 | JC | 11/20/17 |

On-Site Environmental
Project Name: RDMOND PAIRED WATERSHED STUDY
AmTest ID: 17-A019856

AMTEST Identification Number 17-A019856
Client Identification MONMN-20171112
Sampling Date 11/12/17, 20:40

Microbiological

| PARAMETER | RESULT | UNITS | Q | D.L. | METHOD | ANALYST | DATE / TIME |
|----------------|--------|------------|---|------|----------|---------|----------------|
| Fecal Coliform | 50. | CFU/100 ml | | 1 | SM 9222D | JM | 11/13/17 16:00 |

Nutrients

| PARAMETER | RESULT | UNITS | Q | D.L. | METHOD | ANALYST | DATE |
|--------------------------|--------|-------|---|------|-----------|---------|----------|
| Total Nitrogen (NOX&TKN) | 0.62 | mg/l | | 0.1 | | | |
| Total Nitrogen (TKN) | 0.496 | mg/l | | 0.1 | EPA 351.2 | JC | 11/21/17 |
| Nitrate + Nitrite | 0.12 | mg/l | | 0.01 | EPA 353.2 | JC | 11/20/17 |

On-Site Environmental
Project Name: RDMOND PAIRED WATERSHED STUDY
AmTest ID: 17-A019857

AMTEST Identification Number 17-A019857
Client Identification MONMS-20171112
Sampling Date 11/12/17, 21:00

Microbiological

| PARAMETER | RESULT | UNITS | Q | D.L. | METHOD | ANALYST | DATE / TIME |
|----------------|--------|------------|---|------|----------|---------|----------------|
| Fecal Coliform | 210 | CFU/100 ml | | 1 | SM 9222D | JM | 11/13/17 16:00 |

Nutrients

| PARAMETER | RESULT | UNITS | Q | D.L. | METHOD | ANALYST | DATE |
|--------------------------|--------|-------|---|------|-----------|---------|----------|
| Total Nitrogen (NOX&TKN) | 0.71 | mg/l | | 0.1 | | | |
| Total Nitrogen (TKN) | 0.491 | mg/l | | 0.1 | EPA 351.2 | JC | 11/21/17 |
| Nitrate + Nitrite | 0.22 | mg/l | | 0.01 | EPA 353.2 | JC | 11/20/17 |

AMTEST Identification Number 17-A019858
Client Identification MONM-20171112
Sampling Date 11/12/17, 22:00

Microbiological

| PARAMETER | RESULT | UNITS | Q | D.L. | METHOD | ANALYST | DATE / TIME |
|----------------|--------|------------|---|------|----------|---------|----------------|
| Fecal Coliform | 90. | CFU/100 ml | | 1 | SM 9222D | JM | 11/13/17 16:00 |

Nutrients

| PARAMETER | RESULT | UNITS | Q | D.L. | METHOD | ANALYST | DATE |
|--------------------------|--------|-------|---|------|-----------|---------|----------|
| Total Nitrogen (NOX&TKN) | 0.67 | mg/l | | 0.1 | | | |
| Total Nitrogen (TKN) | 0.481 | mg/l | | 0.1 | EPA 351.2 | JC | 11/21/17 |
| Nitrate + Nitrite | 0.19 | mg/l | | 0.01 | EPA 353.2 | JC | 11/20/17 |

AMTEST Identification Number 17-A019859
Client Identification SEIMN-20171112
Sampling Date 11/12/17, 20:25

Microbiological

| PARAMETER | RESULT | UNITS | Q | D.L. | METHOD | ANALYST | DATE / TIME |
|----------------|--------|------------|---|------|----------|---------|----------------|
| Fecal Coliform | 10. | CFU/100 ml | | 1 | SM 9222D | JM | 11/13/17 16:00 |

Nutrients

| PARAMETER | RESULT | UNITS | Q | D.L. | METHOD | ANALYST | DATE |
|--------------------------|--------|-------|---|------|-----------|---------|----------|
| Total Nitrogen (NOX&TKN) | 0.67 | mg/l | | 0.1 | | | |
| Total Nitrogen (TKN) | 0.543 | mg/l | | 0.1 | EPA 351.2 | JC | 11/21/17 |
| Nitrate + Nitrite | 0.13 | mg/l | | 0.01 | EPA 353.2 | JC | 11/20/17 |

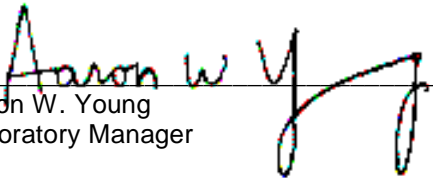
AMTEST Identification Number 17-A019860
Client Identification SEIMS-20171112
Sampling Date 11/12/17, 21:40

Microbiological

| PARAMETER | RESULT | UNITS | Q | D.L. | METHOD | ANALYST | DATE / TIME |
|----------------|--------|------------|---|------|----------|---------|----------------|
| Fecal Coliform | 10. | CFU/100 ml | | 1 | SM 9222D | JM | 11/13/17 16:00 |

Nutrients

| PARAMETER | RESULT | UNITS | Q | D.L. | METHOD | ANALYST | DATE |
|--------------------------|--------|-------|---|------|-----------|---------|----------|
| Total Nitrogen (NOX&TKN) | 0.72 | mg/l | | 0.1 | | | |
| Total Nitrogen (TKN) | 0.551 | mg/l | | 0.1 | EPA 351.2 | JC | 11/21/17 |
| Nitrate + Nitrite | 0.17 | mg/l | | 0.01 | EPA 353.2 | JC | 11/20/17 |


Aaron W. Young
Laboratory Manager

QC Summary for sample numbers: 17-A019846 to 17-A019860

DUPLICATES

| SAMPLE # | ANALYTE | UNITS | SAMPLE VALUE | DUP VALUE | RPD |
|------------|----------------------|------------|--------------|-----------|-----|
| 17-A019840 | Fecal Coliform | CFU/100 ml | < 10 | < 10 | |
| 17-A019881 | Fecal Coliform | CFU/100 ml | 260 | 420 | 47. |
| 17-A019886 | Fecal Coliform | CFU/100 ml | 140 | 120 | 15. |
| 17-A019728 | Total Nitrogen (TKN) | mg/l | < 0.1 | < 0.1 | |
| 17-A019831 | Total Nitrogen (TKN) | mg/l | < 0.1 | < 0.1 | |
| 17-A019849 | Total Nitrogen (TKN) | mg/l | 0.509 | 0.600 | 16. |
| 17-A019859 | Total Nitrogen (TKN) | mg/l | 0.543 | 0.537 | 1.1 |
| 17-A019852 | Nitrate + Nitrite | mg/l | 0.080 | 0.082 | 2.5 |
| 17-A019953 | Nitrate + Nitrite | mg/l | < 0.01 | < 0.01 | |
| 17-A020227 | Nitrate + Nitrite | mg/l | < 0.1 | < 0.1 | |
| 17-A020244 | Nitrate + Nitrite | mg/l | 0.82 | 0.81 | 1.2 |

MATRIX SPIKES

| SAMPLE # | ANALYTE | UNITS | SAMPLE VALUE | SMPL+ SPK | SPK AMT | RECOVERY |
|------------|----------------------|-------|--------------|-----------|---------|----------|
| 17-A019728 | Total Nitrogen (TKN) | mg/l | < 0.1 | 2.15 | 2.00 | 107.50 % |
| 17-A019831 | Total Nitrogen (TKN) | mg/l | < 0.1 | 2.11 | 2.00 | 105.50 % |
| 17-A019849 | Total Nitrogen (TKN) | mg/l | 0.509 | 2.69 | 2.00 | 109.05 % |
| 17-A019859 | Total Nitrogen (TKN) | mg/l | 0.543 | 2.62 | 2.00 | 103.85 % |
| 17-A019852 | Nitrate + Nitrite | mg/l | 0.080 | 1.0 | 1.0 | 92.00 % |
| 17-A019953 | Nitrate + Nitrite | mg/l | < 0.01 | 0.92 | 1.0 | 92.00 % |
| 17-A020227 | Nitrate + Nitrite | mg/l | < 0.1 | 0.83 | 1.0 | 83.00 % |
| 17-A020244 | Nitrate + Nitrite | mg/l | 0.82 | 1.7 | 1.0 | 88.00 % |

STANDARD REFERENCE MATERIALS

| ANALYTE | UNITS | TRUE VALUE | MEASURED VALUE | RECOVERY |
|----------------------|-------|------------|----------------|----------|
| Total Nitrogen (TKN) | mg/l | 1.00 | 1.02 | 102. % |
| Total Nitrogen (TKN) | mg/l | 1.00 | 1.04 | 104. % |
| Nitrate + Nitrite | mg/l | 1.0 | 0.89 | 89.0 % |
| Nitrate + Nitrite | mg/l | 1.0 | 0.89 | 89.0 % |

BLANKS

| ANALYTE | UNITS | RESULT |
|----------------------|------------|--------|
| Fecal Coliform | CFU/100 ml | < 1 |
| Fecal Coliform | CFU/100 ml | < 1 |
| Fecal Coliform | CFU/100 ml | < 1 |
| Total Nitrogen (TKN) | mg/l | < 0.1 |
| Total Nitrogen (TKN) | mg/l | < 0.1 |
| Nitrate + Nitrite | mg/l | < 0.01 |

QC Summary for sample numbers: 17-A019846 to 17-A019860...

BLANKS continued....

| ANALYTE | UNITS | RESULT |
|-------------------|-------|--------|
| Nitrate + Nitrite | mg/l | < 0.01 |



14648 NE 95th Street, Redmond, WA 98052 · (425) 883-3881

Laboratory: AmTest Laboratories

Attention: Aaron Young

13600 NE 126th PI Kirkland, WA 98034

Phone Number: (425) 885-1664

Turnaround Request

1 Day 2 Day 3 Day

Standard

Other: _____

Laboratory Reference #: 11-147

Project Manager: Blair Goodrow

email: bgoodrow@onsite-env.com

Project Number: 14-05806-000

Project Name: Redmond Paired Watershed Study

page 1 of 2
Page 2 of 2
P.18

| Lab ID | Sample Identification | Date Sampled | Time Sampled | Matrix | # of Cont. | Requested Analyses |
|--------|-----------------------|--------------|--------------|--------|------------|---|
| 11 | TOSMI-20171112 | 11/12/17 | 1815 | Water | 2 | Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N |
| 12 | TOSMO-20171112 | 11/12/17 | 1920 | Water | 2 | Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N |
| 13 | TYLMI-20171018 | 11/12/17 | 2010 | Water | 2 | Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N |
| 14 | TYLMO-20171018 | 11/12/17 | 1950 | Water | 2 | Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N |
| 15 | QA-35-20171018 | 11/12/17 | 1800 | Water | 2 | Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |

| Signature | Company | Date | Time | Comments/Special Instructions |
|-------------------------------------|---------|----------|------|--|
| Relinquished by: <i>[Signature]</i> | OSE | 11/13/17 | 1240 | EDDs - CSV Reporting Limits: Fecal Coliform - 1.0 cfu/100ml Total Nitrogen - .10 mg/L |
| Received by: <i>[Signature]</i> | T = 4.3 | 11/13/17 | 1240 | |
| Relinquished by: | | | | |
| Received by: | | | | |
| Relinquished by: | | | | |
| Received by: | | | | |



14648 NE 95th Street, Redmond, WA 98052 · (425) 883-3881

Laboratory: AmTest Laboratories

Attention: Aaron Young

13600 NE 126th PI Kirkland, WA 98034

Phone Number: (425) 885-1664

Turnaround Request

1 Day 2 Day 3 Day

Standard

Other: _____

Laboratory Reference #: 11-147

Project Manager: Blair Goodrow

email: bgoodrow@onsite-env.com

Project Number: 14-05806-000

Project Name: Redmond Paired Watershed Study

| Lab ID | Sample Identification | Date Sampled | Time Sampled | Matrix | # of Cont. | Requested Analyses |
|------------------|-----------------------|--------------|--------------|----------|------------|--|
| 185 1 | COLM-20171112 | 11/12/17 | 2105 | Water | 2 | Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N |
| 5 2 | COUMI-20171112 | 11/12/17 | 1850 | Water | 2 | Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N |
| 5 3 | COUMO-20171112 | 11/12/17 | 1830 | Water | 2 | Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N |
| 5 4 | EVAMS-20171112 | 11/12/17 | 1850 | Water | 2 | Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N |
| 5 5 | EVALSS-20171112 | 11/12/17 | 1915 | Water | 2 | Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N |
| 5 6 | MONMN-20171112 | 11/12/17 | 2040 | Water | 2 | Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N |
| 5 7 | MONMS-20171112 | 11/12/17 | 2100 | Water | 2 | Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N |
| 5 8 | MONM-20171112 | 11/12/17 | 2200 | Water | 2 | Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N |
| 5 9 | SEIMN-20171112 | 11/12/17 | 2025 | Water | 2 | Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N |
| 6 0 | SEIMS-20171112 | 11/12/17 | 2140 | Water | 2 | Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N |
| Signature | | Company | | Date | Time | Comments/Special Instructions |
| Relinquished by: | | OSE | | 11/13/17 | 1240 | |
| Received by: | | T=4.3 | | 11/13/17 | 1240 | |
| Relinquished by: | | | | | | |
| Received by: | | | | | | |
| Relinquished by: | | | | | | EDDs - CSV Reporting Limits: Fecal Coliform - 1.0 cfu/100ml Total Nitrogen - .10 mg/L |
| Received by: | | | | | | |



14648 NE 95th Street, Redmond, WA 98052
Telephone: 425.883.3881

Company: Herrera Environmental Consultants
Project No.: 14-05806-000
Project Name: Redmond Paired Watershed Study
Project Manager: George Iftner

CHAIN OF CUSTODY

Turnaround Requested:

_____ 1 Day
_____ 2 Day
_____ 3 Day
 Standard

Laboratory No. 11-147

Requested Analyses

| Total Suspended Solids (SM 2540D) | Turbidity (EPA 181.1) | Hardness (EPA 200.7 / SM 2340B) | Dissolved Organ Carbon (SM 5310B) * | Fecal Coliform (SM 9222D) | Total Phosphorus (EPA 365.1) | Total Nitrogen (SM 4500 N-B) | Total Cu and Zn (EPA 200.8) | Dissolved Cu and Zn (EPA 200.8) * |
|-----------------------------------|-----------------------|---------------------------------|-------------------------------------|---------------------------|------------------------------|------------------------------|-----------------------------|-----------------------------------|
|-----------------------------------|-----------------------|---------------------------------|-------------------------------------|---------------------------|------------------------------|------------------------------|-----------------------------|-----------------------------------|

| Lab ID | Sample Identification | Date Sampled | Time Sampled | Matrix | # of Cont. | Total Suspended Solids (SM 2540D) | Turbidity (EPA 181.1) | Hardness (EPA 200.7 / SM 2340B) | Dissolved Organ Carbon (SM 5310B) * | Fecal Coliform (SM 9222D) | Total Phosphorus (EPA 365.1) | Total Nitrogen (SM 4500 N-B) | Total Cu and Zn (EPA 200.8) | Dissolved Cu and Zn (EPA 200.8) * |
|--------|-----------------------|--------------|--------------|--------|------------|-----------------------------------|-----------------------|---------------------------------|-------------------------------------|---------------------------|------------------------------|------------------------------|-----------------------------|-----------------------------------|
| 1 | COLM-2017 1112 | 11.12.17 | 2105 | Water | 7 | X | X | X | X | X | X | X | X | X |
| 2 | COUMI-2017 1112 | | 1850 | Water | 7 | X | X | X | X | X | X | X | X | X |
| 3 | COUMO-2017 1112 | | 1830 | Water | 7 | X | X | X | X | X | X | X | X | X |
| 4 | EVAMS-2017 1112 | | 1850 | Water | 7 | X | X | X | X | X | X | X | X | X |
| 5 | EVALSS-2017 1112 | | 1915 | Water | 7 | X | X | X | X | X | X | X | X | X |
| 6 | MONMN-2017 1112 | | 2040 | Water | 7 | X | X | X | X | X | X | X | X | X |
| 7 | MONMS-2017 1112 | | 2100 | Water | 7 | X | X | X | X | X | X | X | X | X |
| 8 | MONM-2017 1112 | | 2200 | Water | 7 | X | X | X | X | X | X | X | X | X |
| 9 | SEIMN-2017 1112 | | 2025 | Water | 7 | X | X | X | X | X | X | X | X | X |
| 10 | SEIMS-2017 1112 | | 2140 | Water | 7 | X | X | X | X | X | X | X | X | X |
| 11 | TOSMI-2017 1112 | | 1815 | Water | 7 | X | X | X | X | X | X | X | X | X |
| 12 | TOSMO-2017 1112 | | 1920 | Water | 7 | X | X | X | X | X | X | X | X | X |
| 13 | TYLMI-2017 1112 | | 2010 | Water | 7 | X | X | X | X | X | X | X | X | X |
| 14 | TYLMO-2017 1112 | | 1950 | Water | 7 | X | X | X | X | X | X | X | X | X |
| 15 | QA 35-2017 1112 | | 1800 | Water | 7 | X | X | X | X | X | X | X | X | X |

Relinquished by Mianna Date 11/13/17 Received by [Signature] Date 11/13/17
 Firm Herrera Time 850 Firm OSE Time 850

Relinquished by _____ Date _____ Received by _____ Date _____
 Firm _____ Time _____ Firm _____ Time _____

Comments:
* - field filtered with 0.45 µm filter within 15 minutes of collecting sample



14648 NE 95th Street, Redmond, WA 98052
Telephone: 425.883.3881

Company: Herrera Environmental Consultants
Project No.: 14-05806-000
Project Name: Redmond Paired Watershed Study
Project Manager: George Illner

CHAIN OF CUSTODY

Turnaround Requested:

- 1 Day
- 2 Day
- 3 Day
- Standard

Laboratory No.

11-147

Requested Analyses

| Total Suspended Solids (SM 2540D) | Turbidity (EPA 181.1) | Hardness (EPA 200.7 / SM 2340B) | Dissolved Organ Carbon (SM 5310B) * | Fecal Coliform (SM 9222D) | Total Phosphorus (EPA 365.1) | Total Nitrogen (SM 4500 N-B) | Total Cu and Zn (EPA 200.8) | Dissolved Cu and Zn (EPA 200.8) * | | | | | | | | | | |
|-----------------------------------|-----------------------|---------------------------------|-------------------------------------|---------------------------|------------------------------|------------------------------|-----------------------------|-----------------------------------|--|--|--|--|--|--|--|--|--|--|
| X | X | X | X | X | X | X | X | X | | | | | | | | | | |
| X | X | X | X | X | X | X | X | X | | | | | | | | | | |
| X | X | X | X | X | X | X | X | X | | | | | | | | | | |
| X | X | X | X | X | X | X | X | X | | | | | | | | | | |
| X | X | X | X | X | X | X | X | X | | | | | | | | | | |
| X | X | X | X | X | X | X | X | X | | | | | | | | | | |
| X | X | X | X | X | X | X | X | X | | | | | | | | | | |
| X | X | X | X | X | X | X | X | X | | | | | | | | | | |
| X | X | X | X | X | X | X | X | X | | | | | | | | | | |
| X | X | X | X | X | X | X | X | X | | | | | | | | | | |
| X | X | X | X | X | X | X | X | X | | | | | | | | | | |
| X | X | X | X | X | X | X | X | X | | | | | | | | | | |
| X | X | X | X | X | X | X | X | X | | | | | | | | | | |
| X | X | X | X | X | X | X | X | X | | | | | | | | | | |
| X | X | X | X | X | X | X | X | X | | | | | | | | | | |
| X | X | X | X | X | X | X | X | X | | | | | | | | | | |
| X | X | X | X | X | X | X | X | X | | | | | | | | | | |

| Lab ID | Sample Identification | Date Sampled | Time Sampled | Matrix | # of Cont. |
|--------|-----------------------|--------------|--------------|--------|------------|
| 1 | COLM-2017 1112 | 11-12-17 | 2105 | Water | 7 |
| 2 | COUMI-2017 1112 | | 1850 | Water | 7 |
| 3 | COUMO-2017 1112 | | 1830 | Water | 7 |
| 4 | EVAMS-2017 1112 | | 1850 | Water | 7 |
| 5 | EVALSS-2017 1112 | | 1915 | Water | 7 |
| 6 | MONMN-2017 1112 | | 2040 | Water | 7 |
| 7 | MONMS-2017 1112 | | 2100 | Water | 7 |
| 8 | MONM-2017 1112 | | 2200 | Water | 7 |
| 9 | SEIMN-2017 1112 | | 2025 | Water | 7 |
| 10 | SEIMS-2017 1112 | | 2140 | Water | 7 |
| 11 | TOSMI-2017 1112 | | 1815 | Water | 7 |
| 12 | TOSMO-2017 1112 | | 1920 | Water | 7 |
| 13 | TYLMI-2017 1112 | | 2010 | Water | 7 |
| 14 | TYLMO-2017 1112 | | 1950 | Water | 7 |
| 15 | QA 35-2017 1112 | | 1800 | Water | 7 |

Relinquished by Miranda Date 11/13/17 Received by [Signature] Date 11/13/17

Firm Herrera Time 850 Firm OSE Time 850

Relinquished by _____ Date _____ Received by _____ Date _____

Firm _____ Time _____ Firm _____ Time _____

Comments:
* - field filtered with 0.45 µm filter within 15 minutes of collecting sample

METER CALIBRATION LOG - Redmond Paired Watershed Study

| | | | |
|-----------------------------------|--------------|-------|-------|
| Project Number: | 14-05806-000 | | |
| Personnel Performing Calibration: | G. J. Fisher | | |
| Meter: | YCF DSS #1 | | |
| Date/Time: | 11/12/17 | 17:20 | |
| Barometric Pressure Start of Day: | mmHg: 754.3 | Time: | 17:20 |
| Barometric Pressure End of Day: | mmHg: 750.3 | Time: | 23:00 |

Calibration Procedures:

Rinse Multimeter Sonde Between Each Operation

Rinse 3 times with tap water, 3 times with deionized water, then 3 times with the solution to be used for calibrating or testing.

Conductivity Calibration Notes:

1. Dry the conductivity probe with a lab tissue (e.g., KimWipes®) and DI water.
2. Fill calibration cup to within a centimeter of the top of the calibration cup with DI water (0 µS).
3. Fill the calibration cup with 1,000 µS standard so that the temperature/conductivity probe is submerged.
4. Make sure there are no bubbles in the cell; wait 2 minutes.
5. Enter the appropriate standard value (1,000 µS/cm or 1.0 mS/cm) for Sp Cond.
6. Check conductivity using 100 µS/cm standard.

Dissolved Oxygen Calibration Notes:

1. Fill the calibration cup with about 1/2 inch of DI; it should be below the sensor cap.
2. Use KimWipes® to dry any droplets from the sensor cap.
3. Invert calibration cup's cap and gently rest it on the cup.
4. Wait 5 minutes, making sure that temperature stabilizes.
5. Determine local barometric pressure (mm Hg) and enter this value into the meter.
6. Click "Calibrate". "Calibrate Successful" will be displayed.
7. To retain calibration accuracy between measurements, store with the sensor immersed in water or within a water-saturated air environment such as a sealed storage cup with at least 10 ml of water.
8. It is important to have the water-saturated air and the sensor at the same temperature. Therefore, store a jar of DI in the same environment as the sonde and calibrate in a similar air temperature as the water and sonde.
9. Keep probe out of direct sun or wind.



| PRE Field Run CALIBRATION | Meter Reading | Buffer / Cal Std | Temp °C | Comments |
|---------------------------|---------------|------------------|---------|-------------|
| Conductivity (µS/cm) | 10.4 | 0 | 22 | calibration |
| Conductivity (µS/cm) | 1004 | 1,000 | 21.9 | Good. |
| Conductivity (µS/cm) | 103.4 | 100 | 22.2 | |
| DO % Saturation | 100.2 | 100 | 21.9 | |
| POST Field Run CHECK | Meter Reading | Buffer / Cal Std | Temp °C | Comments |
| Conductivity (µS/cm) | 10.2 | 0 | 21.6 | |
| Conductivity (µS/cm) | 99.0 | 100 | 21.6 | |
| DO % Saturation | 101.9 | 100 | 20.6 | |

METER CALIBRATION LOG - Redmond Paired Watershed Study

| | | | |
|-----------------------------------|--------------|------------|--|
| Project Number: | 14-05806-000 | | |
| Personnel Performing Calibration: | G. Herrera | | |
| Meter: | YSI Pro Plus | | |
| Date/Time: | 11/12/17 | 17:20 | |
| Barometric Pressure Start of Day: | mmHg: 754.5 | Time: 1720 | |
| Barometric Pressure End of Day: | mmHg: | Time: | |

Calibration Procedures:

Rinse Multimeter Sonde Between Each Operation

Rinse 3 times with tap water, 3 times with deionized water, then 3 times with the solution to be used for calibrating or testing.

Conductivity Calibration Notes:

1. Dry the conductivity probe with a lab tissue (e.g., KimWipes®) and DI water.
2. Fill calibration cup to within a centimeter of the top of the calibration cup with DI water (0 µS).
3. Fill the calibration cup with 1,000 µS standard so that the temperature/conductivity probe is submerged.
4. Make sure there are no bubbles in the cell; wait 2 minutes.
5. Enter the appropriate standard value (1,000 µS/cm or 1.0 mS/cm) for Sp Cond.
6. Check conductivity using 100 µS/cm standard.

Dissolved Oxygen Calibration Notes:

1. Fill the calibration cup with about 1/2 inch of DI; it should be below the sensor cap.
2. Use KimWipes® to dry any droplets from the sensor cap.
3. Invert calibration cup's cap and gently rest it on the cup.
4. Wait 5 minutes, making sure that temperature stabilizes.
5. Determine local barometric pressure (mm Hg) and enter this value into the meter.
6. Click "Calibrate". "Calibrate Successful" will be displayed.
7. To retain calibration accuracy between measurements, store with the sensor immersed in water or within a water-saturated air environment such as a sealed storage cup with at least 10 ml of water.
8. It is important to have the water-saturated air and the sensor at the same temperature. Therefore, store a jar of DI in the same environment as the sonde and calibrate in a similar air temperature as the water and sonde.
9. Keep probe out of direct sun or wind.



| PRE Field Run CALIBRATION | Meter Reading | Buffer / Cal Std | Temp °C | Comments |
|---------------------------|---------------|------------------|---------|----------|
| Conductivity (µS/cm) | 4.8 | 0 | 22.2 | |
| Conductivity (µS/cm) | 1000 | 1,000 | 22.3 | |
| Conductivity (µS/cm) | 100.9 | 100 | 22.4 | |
| DO % Saturation | 101 | 100 | 21.7 | |
| | | | | |
| POST Field Run CHECK | Meter Reading | Buffer / Cal Std | Temp °C | Comments |
| Conductivity (µS/cm) | 5.6 | 0 | 22.3 | |
| Conductivity (µS/cm) | 99.0 | 100 | 22.2 | |
| DO % Saturation | 91.6 | 100 | 18.5 | |

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: BAB
 Sample Date: 11.12.17 Sample Time: 2105 PDT
 Base Flow or Storm Event? (circled) Field Filtered Time: 2110 PST X
(Must filter within 15 minutes of collection)

SITE ID: COLM

Project Number: 14-05806-000

Project Name: Redmond Paired Watershed Study

Current Weather and Temp: cloudy 48°F



Water Quality Sampling

Sample ID: COLM-2017112

| Parameter | Bottle Type | Bottle Volume | # Bottles | Preservative | Duplicated? |
|---------------------------|-------------|---------------|-----------|--------------------------------|-------------|
| TSS and Turbidity | HDPE | 1L | 1 | NA | N |
| DOC * | HDPE | 250 ml | 1 | HCL | |
| Fecal Col. Bact. | HDPE | 250 ml | 1 | EDTA | |
| T. Phosphorous | HDPE | 250 ml | 1 | H ₂ SO ₄ | |
| T. Nitrogen | HDPE | 250 ml | 1 | H ₂ SO ₄ | |
| Diss. Cu and Zn * | HDPE | 250 ml | 1 | HNO ₃ | |
| Hardness, Total Cu and Zn | HDPE | 500 ml | 1 | HNO ₃ | V |

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID: _____
 Filter blank sample ID: _____
 Transfer blank sample ID: _____

Visual and Olfactory Conditions:

Clarity: clear
 Color: none
 Odor: _____
 Sheen: _____
 Floatables: _____

LABORATORY DELIVERY

Date: _____ Time: _____

Quality Assurance

Checked By: S. Hernandez Signature: [Signature]
 Date Checked: 11-15-17 Time: _____
 Data Entered into Database? YES [initials] NO _____
 Date Entered: _____ Time: _____
 Notes: _____

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

YSI Pro Plus (15D100020) X
 YSI Pro DSS 1 _____
 YSI Pro DSS 2 _____

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): 5.68
 Reference Point (description): SG

Water Quality Measurements

Temperature (°C) 7.5
 Specific Conductivity (µs/cm) 42.8
 Dissolved Oxygen (mg/L) 9.90

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: M. Mullen, G. Iftner

Sample Date: 11-12-17

Sample Time: 18:50

PDT:

SITE ID: COUMI

Base Flow or Storm Event? Storm

Field Filtered Time: 19:00

PST:

Project Number: 14-05806-000

(Must filter within 15 minutes of collection)



Project Name: Redmond Paired Watershed Study

Current Weather and Temp: Lt. rain 55°

Water Quality Sampling

Sample ID: COUMI-20171112

| Parameter | Bottle Type | Bottle Volume | # Bottles | Preservative | Duplicated? |
|---------------------------|-------------|---------------|-----------|--------------------------------|-------------|
| TSS and Turbidity | HDPE | 1L | 1 | NA | |
| DOC * | HDPE | 250 ml | 1 | HCL | |
| Fecal Col. Bact. | HDPE | 250 ml | 1 | EDTA | |
| T. Phosphorous | HDPE | 250 ml | 1 | H ₂ SO ₄ | |
| T. Nitrogen | HDPE | 250 ml | 1 | H ₂ SO ₄ | |
| Diss. Cu and Zn * | HDPE | 250 ml | 1 | HNO ₃ | |
| Hardness, Total Cu and Zn | HDPE | 500 ml | 1 | HNO ₃ | |

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID: _____
 Filter blank sample ID: _____
 Transfer blank sample ID: _____

Visual and Olfactory Conditions:

Clarity: V. Slightly turbid
 Color: Colorless
 Odor: None
 Sheen: _____
 Floatables: _____

LABORATORY DELIVERY

Date: _____ Time: _____

Quality Assurance

Checked By: Sheri Leuth Signature: [Signature]
 Date Checked: 11-15-17 Time: _____
 Data Entered into Database? YES / NO initials: _____
 Date Entered: _____ Time: _____
 Notes: _____

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

YSI Pro Plus (15D100020) _____
 YSI Pro DSS 1 _____
 YSI Pro DSS 2 _____

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): 2.77'
 Reference Point (description): Staff gauge

Water Quality Measurements

Temperature (°C) 9.4
 Specific Conductivity (µs/cm) 125.1
 Dissolved Oxygen (mg/L) 11.02

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: G. Iffler Mr. Miller
 Sample Date: 11/12/17 Sample Time: 18:30
 Base Flow or Storm Event? Storm Field Filtered Time: 18:40
 (Must filter within 15 minutes of collection)

SITE ID: COMMO
 Project Number: 14-05806-000



Project Name: Redmond Paired Watershed Study
 Current Weather and Temp: Rain 55°

Water Quality Sampling

Sample ID: COMMO-20171112

| Parameter | Bottle Type | Bottle Volume | # Bottles | Preservative | Duplicated? |
|---------------------------|-------------|---------------|-----------|--------------------------------|-------------------------------------|
| TSS and Turbidity | HDPE | 1L | 1 | NA | <input checked="" type="checkbox"/> |
| DOC * | HDPE | 250 ml | 1 | HCL | <input checked="" type="checkbox"/> |
| Fecal Col. Bact. | HDPE | 250 ml | 1 | EDTA | <input checked="" type="checkbox"/> |
| T. Phosphorous | HDPE | 250 ml | 1 | H ₂ SO ₄ | <input checked="" type="checkbox"/> |
| T. Nitrogen | HDPE | 250 ml | 1 | H ₂ SO ₄ | <input checked="" type="checkbox"/> |
| Diss. Cu and Zn * | HDPE | 250 ml | 1 | HNO ₃ | <input checked="" type="checkbox"/> |
| Hardness, Total Cu and Zn | HDPE | 500 ml | 1 | HNO ₃ | <input checked="" type="checkbox"/> |

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID: BA35-20171112 @ 18:00
 Filter blank sample ID:
 Transfer blank sample ID:

Visual and Olfactory Conditions:

Clarity: sl. turbid very slightly turbid
 Color: colorless
 Odor: —
 Sheen: —
 Floatables: —

LABORATORY DELIVERY

Date: _____ Time: _____

Quality Assurance

Checked By: John Lentz Signature: [Signature]
 Date Checked: 11-15-17 Time: _____
 Data Entered into Database? YES NO initials: _____
 Date Entered: _____ Time: _____
 Notes: _____

Field Meter Calibration

Check which field meter was used and complete the meter calibration form
 YSI Pro Plus (15D100020) _____
 YSI Pro DSS 1 _____
 YSI Pro DSS 2 _____

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)
 Stream Stage (ft): 1.44
 Reference Point (description): Stalk of average

Water Quality Measurements

Temperature (°C) 10.1
 Specific Conductivity (µs/cm) 142.9
 Dissolved Oxygen (mg/L) 10.04

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: BDB
 Sample Date: 11.12.17 Sample Time: 1850 PDT:
 Base Flow or Storm Event? Storm Field Filtered Time: 1855 PST: X
 (Must filter within 15 minutes of collection)

SITE ID: EVAMS
 Project Number: 14-05806-000



Project Name: Redmond Paired Watershed Study
 Current Weather and Temp: Rainy B 48°F

Water Quality Sampling

Sample ID: EVAMS-20171112

| Parameter | Bottle Type | Bottle Volume | # Bottles | Preservative | Duplicated? |
|---------------------------|-------------|---------------|-----------|--------------------------------|-------------|
| TSS and Turbidity | HDPE | 1L | 1 | NA | N |
| DOC * | HDPE | 250 ml | 1 | HCL | ↓ |
| Fecal Col. Bact. | HDPE | 250 ml | 1 | EDTA | |
| T. Phosphorous | HDPE | 250 ml | 1 | H ₂ SO ₄ | |
| T. Nitrogen | HDPE | 250 ml | 1 | H ₂ SO ₄ | |
| Diss. Cu and Zn * | HDPE | 250 ml | 1 | HNO ₃ | |
| Hardness, Total Cu and Zn | HDPE | 500 ml | 1 | HNO ₃ | ↓ |

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID: _____
 Filter blank sample ID: _____
 Transfer blank sample ID: _____

Visual and Olfactory Conditions:

Clarity: clear
 Color: none
 Odor: _____
 Sheen: _____
 Floatables: org. debris

LABORATORY DELIVERY

Date: _____ Time: _____

Quality Assurance

Checked By: Solomon Leventhal Signature: [Signature]
 Date Checked: 11-15-17 Time: _____
 Data Entered into Database? YES NO initials:
 Date Entered: _____ Time: _____
 Notes: _____

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

YSI Pro Plus (15D100020) X
 YSI Pro DSS 1 _____
 YSI Pro DSS 2 _____

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): 3.96
 Reference Point (description): SG

Water Quality Measurements

Temperature (°C) 8.9
 Specific Conductivity (µs/cm) 181.5
 Dissolved Oxygen (mg/L) 11.06

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: BRO
 Sample Date: 11-12-17 Sample Time: 19:15 PDT
 Base Flow or Storm Event? Storm Field Filtered Time: 19:20 PST
(Must filter within 15 minutes of collection)

SITE ID: EVALLSS

Project Number: 14-05806-000



Project Name: Redmond Paired Watershed Study

Current Weather and Temp: drizzling 348°F

Water Quality Sampling

Sample ID: EVALLSS-20171112

| Parameter | Bottle Type | Bottle Volume | # Bottles | Preservative | Duplicated? |
|---------------------------|-------------|---------------|-----------|--------------------------------|-------------|
| TSS and Turbidity | HDPE | 1L | 1 | NA | N |
| DOC * | HDPE | 250 ml | 1 | HCL | ↓ |
| Fecal Col. Bact. | HDPE | 250 ml | 1 | EDTA | |
| T. Phosphorous | HDPE | 250 ml | 1 | H ₂ SO ₄ | |
| T. Nitrogen | HDPE | 250 ml | 1 | H ₂ SO ₄ | |
| Diss. Cu and Zn * | HDPE | 250 ml | 1 | HNO ₃ | |
| Hardness, Total Cu and Zn | HDPE | 500 ml | 1 | HNO ₃ | |
| | | | | | |

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID: _____
 Filter blank sample ID: _____
 Transfer blank sample ID: _____

Visual and Olfactory Conditions:

Clarity: clear
 Color: none
 Odor: _____
 Sheen: _____
 Floatables: ova, debris

LABORATORY DELIVERY

Date: _____ Time: _____

Quality Assurance

Checked By: John Lenth Signature: [Signature]
 Date Checked: 11-15-17 Time: _____
 Data Entered into Database? YES NO initials:
 Date Entered: _____ Time: _____
 Notes: _____

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

YSI Pro Plus (15D100020)
 YSI Pro DSS 1 _____
 YSI Pro DSS 2 _____

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): 2.35
 Reference Point (description): SG

Water Quality Measurements

Temperature (°C) 9.1
 Specific Conductivity (µs/cm) 172.5
 Dissolved Oxygen (mg/L) 11.42

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: G. J. Fisher, M. Mullen

Sample Date: 11/12/17

Sample Time: 20:40

PDT:

SITE ID: MONMN

Base Flow or Storm Event? Storm

Field Filtered Time: 20:45

PST:

Project Number: 14-05806-000

(Must filter within 15 minutes of collection)



Project Name: Redmond Paired Watershed Study

Current Weather and Temp: cloudy 55°

Water Quality Sampling

Sample ID: MONMN-20171112

| Parameter | Bottle Type | Bottle Volume | # Bottles | Preservative | Duplicated? |
|---------------------------|-------------|---------------|-----------|--------------------------------|-------------|
| TSS and Turbidity | HDPE | 1L | 1 | NA | / |
| DOC * | HDPE | 250 ml | 1 | HCL | |
| Fecal Col. Bact. | HDPE | 250 ml | 1 | EDTA | |
| T. Phosphorous | HDPE | 250 ml | 1 | H ₂ SO ₄ | |
| T. Nitrogen | HDPE | 250 ml | 1 | H ₂ SO ₄ | |
| Diss. Cu and Zn * | HDPE | 250 ml | 1 | HNO ₃ | |
| Hardness, Total Cu and Zn | HDPE | 500 ml | 1 | HNO ₃ | |

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID: X
 Filter blank sample ID:
 Transfer blank sample ID:

Visual and Olfactory Conditions:

Clarity: clear
 Color: colorless
 Odor: odorless
 Sheen:
 Floatables:

LABORATORY DELIVERY

Date: _____ Time: _____

Quality Assurance

Checked By: Jahn Lentz Signature: [Signature]
 Date Checked: 11-15-17 Time: _____
 Data Entered into Database? YES NO initials: _____
 Date Entered: _____ Time: _____
 Notes: _____

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

YSI Pro Plus (15D100020) _____
 YSI Pro DSS 1 _____
 YSI Pro DSS 2 _____

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): 9.22
 Reference Point (description): stream gauge

Water Quality Measurements

Temperature (°C) 8.6
 Specific Conductivity (µs/cm) 141.3
 Dissolved Oxygen (mg/L) 10.94

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: G. Iffner, M. Mullen

Sample Date: 11/12/17

Sample Time: 21:00

SITE ID: MONMS

Base Flow or Storm Event? storm

Field Filtered Time: 21:05
(Must filter within 15 minutes of collection)

Project Number: 14-05806-000



Project Name: Redmond Paired Watershed Study

Current Weather and Temp: cloudy 55°

Water Quality Sampling

Sample ID: MONMS-20171112

| Parameter | Bottle Type | Bottle Volume | # Bottles | Preservative | Duplicated? |
|---------------------------|-------------|---------------|-----------|--------------------------------|-------------|
| TSS and Turbidity | HDPE | 1L | 1 | NA | / |
| DOC * | HDPE | 250 ml | 1 | HCL | |
| Fecal Col. Bact. | HDPE | 250 ml | 1 | EDTA | |
| T. Phosphorous | HDPE | 250 ml | 1 | H ₂ SO ₄ | |
| T Nitrogen | HDPE | 250 ml | 1 | H ₂ SO ₄ | |
| Diss. Cu and Zn * | HDPE | 250 ml | 1 | HNO ₃ | |
| Hardness, Total Cu and Zn | HDPE | 500 ml | 1 | HNO ₃ | |

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID:
Filter blank sample ID:
Transfer blank sample ID:

Visual and Olfactory Conditions:

Clarity: clear
Color: none
Odor: slight sewer odor / rotten
Sheen: none
Floatables: none

LABORATORY DELIVERY

Date: _____ Time: _____

Quality Assurance

Checked By: Susan Leuth Signature: [Signature]
Date Checked: 11-15-17 Time: _____
Data Entered into Database? YES NO initials:
Date Entered: _____ Time: _____
Notes: _____

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

YSI Pro Plus (15D100020) _____
YSI Pro DSS 1 _____
YSI Pro DSS 2 _____

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): 6.65
Reference Point (description): top PVC w/water level indicator

Water Quality Measurements

Temperature (°C) 9.2
Specific Conductivity (µs/cm) 234.5
Dissolved Oxygen (mg/L) 9.23

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: G. I. Fisher, M. Mullen

Sample Date: 11/2/17

Sample Time: 22:00

SITE ID: MONM

Base Flow or Storm Event? Storm

Field Filtered Time: 22:05

Project Number: 14-05806-000

(Must filter within 15 minutes of collection)



Water Quality Sampling

Sample ID: MONM-20171112

Project Name: Redmond Paired Watershed Study

Current Weather and Temp: Lt. rain 55°

| Parameter | Bottle Type | Bottle Volume | # Bottles | Preservative | Duplicated? |
|---------------------------|-------------|---------------|-----------|--------------------------------|-------------|
| TSS and Turbidity | HDPE | 1L | 1 | NA | / |
| DOC * | HDPE | 250 ml | 1 | HCL | |
| Fecal Col. Bact. | HDPE | 250 ml | 1 | EDTA | |
| T. Phosphorous | HDPE | 250 ml | 1 | H ₂ SO ₄ | |
| T. Nitrogen | HDPE | 250 ml | 1 | H ₂ SO ₄ | |
| Diss. Cu and Zn * | HDPE | 250 ml | 1 | HNO ₃ | |
| Hardness, Total Cu and Zn | HDPE | 500 ml | 1 | HNO ₃ | |

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID: _____
 Filter blank sample ID: _____
 Transfer blank sample ID: _____

Visual and Olfactory Conditions:

Clarity: clear
 Color: none
 Odor: musty odor
 Sheen: none
 Floatables: none

LABORATORY DELIVERY

Date: _____ Time: _____

Quality Assurance

Checked By: John Leath Signature: [Signature]

Date Checked: 11-15-17 Time: _____

Data Entered into Database? YES NO initials:

Date Entered: _____ Time: _____

Notes: _____

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

YSI Pro Plus (15D100020) _____
 YSI Pro DSS 1 _____
 YSI Pro DSS 2 _____

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): No measurement NA

Reference Point (description): NA

Water Quality Measurements

Temperature (°C) 8.9

Specific Conductivity (µs/cm) 149.5

Dissolved Oxygen (mg/L) 11.42

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: hb

Sample Date: 11-12-17

Sample Time: 20:25

PDT:

Base Flow or Storm Event?

Field Filtered Time: 20:30

PST

(Must filter within 15 minutes of collection)

SITE

ID:

SEIMN

Project Number: 14-05806-000



HERRERA

Project Name: Redmond Paired Watershed Study

Current Weather and Temp: cloudy 3 48°F

Water Quality Sampling

Sample ID: SEIMN-2017112

| Parameter | Bottle Type | Bottle Volume | # Bottles | Preservative | Duplicated? |
|---------------------------|-------------|---------------|-----------|--------------------------------|-------------|
| TSS and Turbidity | HDPE | 1L | 1 | NA | N |
| DOC * | HDPE | 250 ml | 1 | HCL | ↓ |
| Fecal Col. Bact. | HDPE | 250 ml | 1 | EDTA | |
| T. Phosphorous | HDPE | 250 ml | 1 | H ₂ SO ₄ | |
| T. Nitrogen | HDPE | 250 ml | 1 | H ₂ SO ₄ | |
| Diss. Cu and Zn * | HDPE | 250 ml | 1 | HNO ₃ | |
| Hardness, Total Cu and Zn | HDPE | 500 ml | 1 | HNO ₃ | |
| | | | | | |

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID:

Filter blank sample ID:

Transfer blank sample ID:

Visual and Olfactory Conditions:

Clarity:

clear

Color:

none

Odor:

Sheen:

Floatables:

LABORATORY DELIVERY

Date:

Time:

Quality Assurance

Checked By:

John Lamb

Signature:

[Handwritten Signature]

Date Checked:

11-15-17

Time:

Data Entered into Database?

YES

NO

initials:

Date Entered:

Time:

Notes:

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

YSI Pro Plus (15D100020)

YSI Pro DSS 1

YSI Pro DSS 2

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft):

bottom of bolt ↓ top of water

Reference Point (description):

7.25"

Water Quality Measurements

Temperature (°C)

8.0

Specific Conductivity (µs/cm)

67.4

Dissolved Oxygen (mg/L)

11.71

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: G. Iffner, M. Mubken
 Sample Date: 11/14/17 Sample Time: 21:40 PDT
 Base Flow or Storm Event? Storm Field Filtered Time: 21:45 PST
(Must filter within 15 minutes of collection)

SITE ID: SEIMS
 Project Number: 14-05806-000



Project Name: Redmond Paired Watershed Study

Current Weather and Temp: cloudy 55°

Water Quality Sampling

Sample ID: SEIMS

| Parameter | Bottle Type | Bottle Volume | # Bottles | Preservative | Duplicated? |
|---------------------------|-------------|---------------|-----------|--------------------------------|-------------|
| TSS and Turbidity | HDPE | 1L | 1 | NA | / |
| DOC * | HDPE | 250 ml | 1 | HCL | |
| Fecal Col. Bact. | HDPE | 250 ml | 1 | EDTA | |
| T. Phosphorous | HDPE | 250 ml | 1 | H ₂ SO ₄ | |
| T. Nitrogen | HDPE | 250 ml | 1 | H ₂ SO ₄ | |
| Diss. Cu and Zn * | HDPE | 250 ml | 1 | HNO ₃ | |
| Hardness, Total Cu and Zn | HDPE | 500 ml | 1 | HNO ₃ | |

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID: _____
 Filter blank sample ID: _____
 Transfer blank sample ID: _____

Visual and Olfactory Conditions:

Clarity: clear
 Color: colorless
 Odor: odorless
 Sheen: _____
 Floatables: _____

LABORATORY DELIVERY

Date: _____ Time: _____

Quality Assurance

Checked By: John Leuth Signature: [Signature]
 Date Checked: 11-15-17 Time: _____
 Data Entered into Database? YES NO initials: _____
 Date Entered: _____ Time: _____
 Notes: _____

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

YSI Pro Plus (15D100020) _____
 YSI Pro DSS 1 _____
 YSI Pro DSS 2 _____

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): 0.80'
 Reference Point (description): Stream gauge

Water Quality Measurements

Temperature (°C) 8.0
 Specific Conductivity (µs/cm) 106.2
 Dissolved Oxygen (mg/L) 10.94

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: BBO

Sample Date: 11.12.17

Sample Time: 1815

PDT:

SITE ID: TOSMI

Base Flow or Storm Event? Storm

Field Filtered Time: 1820

PST: X

Project Number: 14-05806-000

(Must filter within 15 minutes of collection)



HERRERA

Project Name: Redmond Paired Watershed Study

Current Weather and Temp: Raining 34°F

Water Quality Sampling

Sample ID: TOSMI-20171112

| Parameter | Bottle Type | Bottle Volume | # Bottles | Preservative | Duplicated? |
|---------------------------|-------------|---------------|-----------|--------------------------------|-------------|
| TSS and Turbidity | HDPE | 1L | 1 | NA | <u>N</u> |
| DOC * | HDPE | 250 ml | 1 | HCL | <u>↓</u> |
| Fecal Col. Bact. | HDPE | 250 ml | 1 | EDTA | <u>↓</u> |
| T. Phosphorous | HDPE | 250 ml | 1 | H ₂ SO ₄ | <u>↓</u> |
| T. Nitrogen | HDPE | 250 ml | 1 | H ₂ SO ₄ | <u>↓</u> |
| Diss. Cu and Zn * | HDPE | 250 ml | 1 | HNO ₃ | <u>↓</u> |
| Hardness, Total Cu and Zn | HDPE | 500 ml | 1 | HNO ₃ | <u>↓</u> |

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID:

Filter blank sample ID:

Transfer blank sample ID:

Visual and Olfactory Conditions:

Clarity: cloudy
 Color: light brown
 Odor: none
 Sheen: none
 Floatables: susp. sed. org. debris

LABORATORY DELIVERY

Date:

Time:

Quality Assurance

Checked By: John Lenton Signature: [Signature]

Date Checked: 11.13.17 Time:

Data Entered into Database? YES NO initials:

Date Entered: Time:

Notes:

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

YSI Pro Plus (15D100020) X

YSI Pro DSS 1

YSI Pro DSS 2

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): 0.91

Reference Point (description): SG

Water Quality Measurements

Temperature (°C) 11.0

Specific Conductivity (µs/cm) 114.1

Dissolved Oxygen (mg/L) 11.10

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: G. Effer, M. Muller

Sample Date: 11/12/17

Sample Time: 19:20

SITE ID: TOSMO

Base Flow or Storm Event? Storm

Field Filtered Time: 19:30

Project Number: 14-05806-000

(Must filter within 15 minutes of collection)



Project Name: Redmond Paired Watershed Study

Current Weather and Temp: lt. rain 55°

Water Quality Sampling

Sample ID: TOSMO-20171112

| Parameter | Bottle Type | Bottle Volume | # Bottles | Preservative | Duplicated? |
|---------------------------|-------------|---------------|-----------|--------------------------------|-------------|
| TSS and Turbidity | HDPE | 1L | 1 | NA | / |
| DOC * | HDPE | 250 ml | 1 | HCL | |
| Fecal Col. Bact. | HDPE | 250 ml | 1 | EDTA | |
| T. Phosphorous | HDPE | 250 ml | 1 | H ₂ SO ₄ | |
| T. Nitrogen | HDPE | 250 ml | 1 | H ₂ SO ₄ | |
| Diss. Cu and Zn * | HDPE | 250 ml | 1 | HNO ₃ | |
| Hardness, Total Cu and Zn | HDPE | 500 ml | 1 | HNO ₃ | |

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID: _____
 Filter blank sample ID: _____
 Transfer blank sample ID: _____

Visual and Olfactory Conditions:

Clarity: Slightly turbid.
 Color: v. light brown
 Odor: _____
 Sheen: _____
 Floatables: Natural foam

LABORATORY DELIVERY

Date: _____ Time: _____

Quality Assurance

Checked By: John Leuth Signature: _____
 Date Checked: 11-13-17 Time: _____
 Data Entered into Database? YES NO initials:
 Date Entered: _____ Time: _____
 Notes: _____

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

YSI Pro Plus (15D100020) _____
 YSI Pro DSS 1 _____
 YSI Pro DSS 2 _____

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): 0.80
 Reference Point (description): Staff gauge

Water Quality Measurements

Temperature (°C) 10.1
 Specific Conductivity (µs/cm) 126.3
 Dissolved Oxygen (mg/L) 11.08



FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: G. Iftner, M. Muller

Sample Date: 11/12/17 Sample Time: 20:10

PDT:

SITE ID: TYLMT

Base Flow or Storm Event? Storm Field Filtered Time: 20:15

PST:

Project Number: 14-05806-000

(Must filter within 15 minutes of collection)



HERRERA

Project Name: Redmond Paired Watershed Study

Current Weather and Temp: Lt. rain 55°

Water Quality Sampling

Sample ID: TYLMT-20171112

| Parameter | Bottle Type | Bottle Volume | # Bottles | Preservative | Duplicated? |
|---------------------------|-------------|---------------|-----------|--------------------------------|-------------|
| TSS and Turbidity | HDPE | 1L | 1 | NA | / |
| DOC * | HDPE | 250 ml | 1 | HCL | |
| Fecal Col. Bact. | HDPE | 250 ml | 1 | EDTA | |
| T. Phosphorous | HDPE | 250 ml | 1 | H ₂ SO ₄ | |
| T. Nitrogen | HDPE | 250 ml | 1 | H ₂ SO ₄ | |
| Diss. Cu and Zn * | HDPE | 250 ml | 1 | HNO ₃ | |
| Hardness, Total Cu and Zn | HDPE | 500 ml | 1 | HNO ₃ | |

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID:

Filter blank sample ID:

Transfer blank sample ID:

Visual and Olfactory Conditions:

Clarity: clear
 Color: colorless
 Odor: odorless
 Sheen:
 Floatables:

LABORATORY DELIVERY

Date: Time:

Quality Assurance

Checked By: Solomon Keyser Signature: [Signature]

Date Checked: 11-13-17 Time:

Date Entered into Database? YES NO initials:

Date Entered: Time:

Notes:

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

YSI Pro Plus (15D100020)

YSI Pro DSS 1

YSI Pro DSS 2

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): 53 1/4'

Reference Point (description): top of culvert down

Water Quality Measurements

Temperature (°C) 9.4

Specific Conductivity (µs/cm) 123.6

Dissolved Oxygen (mg/L) 10.59

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: G. Iffner, M. Muller

Sample Date: 11/12/17

Sample Time: 19:50

PDT:

SITE ID: TYLMO

Base Flow or Storm Event? Storm

Field Filtered Time: 19:55

PST:

Project Number: 14-05806-000

(Must filter within 15 minutes of collection)



Project Name: Redmond Paired Watershed Study

Current Weather and Temp: lt. rain 55°

Water Quality Sampling

Sample ID: TYLMO-20171112

| Parameter | Bottle Type | Bottle Volume | # Bottles | Preservative | Duplicated? |
|---------------------------|-------------|---------------|-----------|--------------------------------|-------------|
| TSS and Turbidity | HDPE | 1L | 1 | NA | / |
| DOC * | HDPE | 250 ml | 1 | HCL | |
| Fecal Col. Bact. | HDPE | 250 ml | 1 | EDTA | |
| T. Phosphorous | HDPE | 250 ml | 1 | H ₂ SO ₄ | |
| T. Nitrogen | HDPE | 250 ml | 1 | H ₂ SO ₄ | |
| Diss. Cu and Zn * | HDPE | 250 ml | 1 | HNO ₃ | |
| Hardness, Total Cu and Zn | HDPE | 500 ml | 1 | HNO ₃ | |

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID: _____

Filter blank sample ID: _____

Transfer blank sample ID: _____

Visual and Olfactory Conditions:

Clarity: clear
 Color: colorless
 Odor: odorless
 Sheen: _____
 Floatables: _____

LABORATORY DELIVERY

Date: _____ Time: _____

Quality Assurance

Checked By: John Lentz Signature: [Signature]
 Date Checked: 11-15-17 Time: _____
 Data Entered into Database? YES NO initials: _____
 Date Entered: _____ Time: _____
 Notes: _____

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

YSI Pro Plus (15D100020) _____
 YSI Pro DSS 1 _____
 YSI Pro DSS 2 _____

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): 2.68

Reference Point (description): Top of culvert down to water surface.

Water Quality Measurements

Temperature (°C) 9.4

Specific Conductivity (µs/cm) 71.5

Dissolved Oxygen (mg/L) 11.03



Data Quality Assurance Worksheet

Project Name/No./Client: Redmond Paired Watershed Study / 14-05806-000 / City of Redmond

Laboratory/Parameters: OnSite Environmental : TSS, turbidity, hardness, DOC, TP, Dissolved & Total Cu, Zn / AmTest: Total nitrogen, fecal coliform bacteria

Sample Date/Sample ID: 11/12/2017 / All sites, 1 FD (QA35) at COUMO

By G. Catarra

Date 12/11/2017 Page 1 of 2

Checked: initials JL

date 1/4/2018

| Parameter | Completeness/ Methodology | Pre-preservation Holding Times (minutes) | | Total Holding Times (days) | | Method Blanks Reporting Limit | Matrix Spikes/ Surrogate Recovery (%) | | Lab Control Samples Recovery (%) | | Lab Duplicates RPD (%) | | Field Duplicates RPD (%) | | Instrument Calibration/ Performance | ACTION |
|-------------------------------------|------------------------------|--|------|-------------------------------|------|--|---|-------------------|--|-------------------|---------------------------|-------------------|-----------------------------|-------------------|---|---|
| | | Reported | Goal | Reported | Goal | | Reported | Goal ¹ | Reported | Goal ¹ | Reported | Goal ¹ | Reported | Goal ¹ | | |
| TSS | OK / SM 2540D | NA | NA | 3 | ≤7 | ≤1.0 mg/L 1.0 mg/L | NA | NA | 108 | ±20 | 3 | ≤25 | 23 | ≤25 | OK | NONE |
| Turbidity | OK / EPA 180.1 | NA | NA | 2 | ≤2 | ≤0.1 NTU 0.1 NTU | NA | NA | NA | ±10 | 2 | ≤25 | 9.2 | ≤25 | OK | NONE |
| Hardness | OK / SM 2340B | NA | NA | 5 | ≤180 | ≤1.0 mg/L 1.0 mg/L | 100,104 | ±25 | 102 | ±15 | 2 | ≤20 | 1.8 | ≤20 | OK | NONE |
| DOC | OK / SM 5310B | <15 | ≤15 | 4 | ≤28 | ≤1.0 mg/L 1.0 mg/L | 98 | ±25 | 105 | ±15 | 0 | ≤20 | 2.8 | ≤20 | OK | NONE |
| Total Phosphorus | OK / EPA 365.1 | NA | NA | 5 | ≤28 | ≤0.01 mg/L 0.01 mg/L | 99 | ±25 | 93 | ±20 | D=0.002 8 | ≤20 | 4.8 | ≤20 | OK | NONE |
| Total Nitrogen (TKN + N+N) | OK/ SM 4500 N-B | NA | NA | 8,9 | ≤28 | ≤0.1 mg/L 0.1 mg/L | 92-109 | ±25 | 89-104 | ±20 | 1.1-16 | ≤20 | 13, 24 | ≤20 | OK | FLAG N+N RESULT FOR COUMO DUE TO FD RPD. |

¹ If the sample or duplicate value is less than five times the reporting limit, the difference is calculated rather than the relative percent difference (RPD). The QA goal is a difference <2 times the detection limit instead of the number indicated in the goal column.

NA – not applicable or not available; NC – not calculable due to one or more values below the detection limit; NS – field duplicate not sampled.



Data Quality Assurance Worksheet

By G. Catarra

Project Name/No./Client: Redmond Paired Watershed Study / 14-05806-000 / City of Redmond

Date 12/11/2017 Page 2 of 2

Laboratory/Parameters: OnSite Environmental : TSS, turbidity, hardness, DOC, TP, Dissolved & Total Cu, Zn / AmTest: total nitrogen, fecal coliform bacteria

Checked: initials JL

Sample Date/Sample ID: 11/12/2017 / All sites, 1 FD (QA35) at COUMO

date 1/4/2018

| Parameter | Completeness/ Methodology | Pre-preservation Holding Times (minutes) | | Total Holding Times (days) | | Method Blanks Reporting Limit | Matrix Spikes/ Surrogate Recovery (%) | | Lab Control Samples Recovery (%) | | Lab Duplicates RPD (%) | | Field Duplicates RPD (%) | | Instrument Calibration/ Performance | ACTION |
|------------------|------------------------------|--|------|-------------------------------|------|---|---|-------------------|--|------|---------------------------|-------------------|-----------------------------|-------------------|---|--------|
| | | Reported | Goal | Reported | Goal | | Reported | Goal ¹ | Reported | Goal | Reported | Goal ¹ | Reported | Goal ¹ | | |
| Total Copper | OK/ EPA 200.8 | NA | NA | 5 | ≤180 | ≤1.0 µg/L 1.0 µg/L | 102,105 | ±25 | NR | ±15 | NC | ≤20 | 4.5 | ≤20 | OK | NONE |
| Total Zinc | OK/ EPA 200.8 | NA | NA | 5 | ≤180 | ≤5.0 µg/L 5.0 µg/L | 106,107 | ±25 | NR | ±15 | NC | ≤20 | 8.4 | ≤20 | OK | NONE |
| Dissolved Copper | OK/ EPA 200.8 | <15 | ≤15 | 3 | ≤180 | ≤1.0 µg/L 1.0 µg/L | 94,90 | ±25 | NR | ±15 | 6 | ≤20 | 0 | ≤20 | OK | NONE |
| Dissolved Zinc | OK/ EPA 200.8 | <15 | ≤15 | 3 | ≤180 | ≤5.0 µg/L 5.0 µg/L | 95,94 | ±25 | NR | ±15 | NC | ≤20 | 0 | ≤20 | OK | NONE |
| Fecal Coliform | OK / SM 9222D | NA | NA | 1 | ≤1 | ≤1.0 cfu/ 100mL 1.0 cfu/ 100mL | NA | NA | NA | NA | NR (batch) | ≤35 | 24 | ≤50 | OK | NONE |

¹ If the sample or duplicate value is less than five times the reporting limit, the difference is calculated rather than the relative percent difference (RPD). The QA goal is a difference <2 times the detection limit instead of the number indicated in the goal column.

NA – not applicable or not available; NC – not calculable due to one or more values below the detection limit; NS – field duplicate not sampled.



14648 NE 95th Street, Redmond, WA 98052 • (425) 883-3881

December 8, 2017

George Iftner
Herrera Environmental Consultants, Inc.
2200 6th Avenue, Suite 1100
Seattle, WA 98121

Re: Analytical Data for Project 14-05806-000
Laboratory Reference No. 1711-240

Dear George:

Enclosed are the analytical results and associated quality control data for samples submitted on November 20, 2017.

The standard policy of OnSite Environmental, Inc. is to store your samples for 30 days from the date of receipt. If you require longer storage, please contact the laboratory.

We appreciate the opportunity to be of service to you on this project. If you have any questions concerning the data, or need additional information, please feel free to call me.

Sincerely,

A handwritten signature in black ink, appearing to read "Blair Goodrow", enclosed within a large, loopy circular flourish.

Blair Goodrow
Project Manager

Enclosures



OnSite Environmental, Inc. 14648 NE 95th Street, Redmond, WA 98052 (425) 883-3881

This report pertains to the samples analyzed in accordance with the chain of custody, and is intended only for the use of the individual or company to whom it is addressed.

Date of Report: December 8, 2017
Samples Submitted: November 20, 2017
Laboratory Reference: 1711-240
Project: 14-05806-000

Case Narrative

Samples were collected on November 19, 2017 and received by the laboratory on November 20, 2017. They were maintained at the laboratory at a temperature of 2°C to 6°C.

Please note that any and all soil sample results are reported on a dry-weight basis, unless otherwise noted below.

General QA/QC issues associated with the analytical data enclosed in this laboratory report will be indicated with a reference to a comment or explanation on the Data Qualifier page. More complex and involved QA/QC issues will be discussed in detail below.



Date of Report: December 8, 2017
 Samples Submitted: November 20, 2017
 Laboratory Reference: 1711-240
 Project: 14-05806-000

**TOTAL SUSPENDED SOLIDS
 SM 2540D**

Matrix: Water
 Units: mg/L

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|------------------------|----------------------|-----|----------|---------------|---------------|-------|
| Client ID: | COLM-20171119 | | | | | |
| Laboratory ID: | 11-240-01 | | | | | |
| Total Suspended Solids | ND | 1.0 | SM 2540D | 11-21-17 | 11-22-17 | |

| | | | | | | |
|------------------------|-----------------------|-----|----------|----------|----------|--|
| Client ID: | COUMI-20171119 | | | | | |
| Laboratory ID: | 11-240-02 | | | | | |
| Total Suspended Solids | 39 | 2.5 | SM 2540D | 11-21-17 | 11-22-17 | |

| | | | | | | |
|------------------------|-----------------------|-----|----------|----------|----------|--|
| Client ID: | COUMO-20171119 | | | | | |
| Laboratory ID: | 11-240-03 | | | | | |
| Total Suspended Solids | 14 | 1.0 | SM 2540D | 11-21-17 | 11-22-17 | |

| | | | | | | |
|------------------------|-----------------------|-----|----------|----------|----------|--|
| Client ID: | EVAMS-20171119 | | | | | |
| Laboratory ID: | 11-240-04 | | | | | |
| Total Suspended Solids | 2.8 | 1.0 | SM 2540D | 11-21-17 | 11-22-17 | |

| | | | | | | |
|------------------------|------------------------|-----|----------|----------|----------|--|
| Client ID: | EVALSS-20171119 | | | | | |
| Laboratory ID: | 11-240-05 | | | | | |
| Total Suspended Solids | 4.6 | 1.0 | SM 2540D | 11-21-17 | 11-22-17 | |

| | | | | | | |
|------------------------|-----------------------|-----|----------|----------|----------|--|
| Client ID: | MONMN-20171119 | | | | | |
| Laboratory ID: | 11-240-06 | | | | | |
| Total Suspended Solids | 6.8 | 1.0 | SM 2540D | 11-21-17 | 11-22-17 | |

| | | | | | | |
|------------------------|-----------------------|-----|----------|----------|----------|--|
| Client ID: | MONMS-20171119 | | | | | |
| Laboratory ID: | 11-240-07 | | | | | |
| Total Suspended Solids | 5.2 | 1.0 | SM 2540D | 11-21-17 | 11-22-17 | |



Date of Report: December 8, 2017
 Samples Submitted: November 20, 2017
 Laboratory Reference: 1711-240
 Project: 14-05806-000

**TOTAL SUSPENDED SOLIDS
SM 2540D**

Matrix: Water
 Units: mg/L

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|------------------------|----------------------|-----|----------|---------------|---------------|-------|
| Client ID: | MONM-20171119 | | | | | |
| Laboratory ID: | 11-240-08 | | | | | |
| Total Suspended Solids | 9.2 | 1.0 | SM 2540D | 11-21-17 | 11-22-17 | |

| | | | | | | |
|------------------------|-----------------------|-----|----------|----------|----------|--|
| Client ID: | SEIMN-20171119 | | | | | |
| Laboratory ID: | 11-240-09 | | | | | |
| Total Suspended Solids | 6.2 | 1.0 | SM 2540D | 11-21-17 | 11-22-17 | |

| | | | | | | |
|------------------------|-----------------------|-----|----------|----------|----------|--|
| Client ID: | SEIMS-20171119 | | | | | |
| Laboratory ID: | 11-240-10 | | | | | |
| Total Suspended Solids | 9.0 | 1.0 | SM 2540D | 11-21-17 | 11-22-17 | |

| | | | | | | |
|------------------------|-----------------------|-----|----------|----------|----------|--|
| Client ID: | TOSMI-20171119 | | | | | |
| Laboratory ID: | 11-240-11 | | | | | |
| Total Suspended Solids | 31 | 1.0 | SM 2540D | 11-21-17 | 11-22-17 | |

| | | | | | | |
|------------------------|-----------------------|-----|----------|----------|----------|--|
| Client ID: | TOSMO-20171119 | | | | | |
| Laboratory ID: | 11-240-12 | | | | | |
| Total Suspended Solids | 21 | 1.0 | SM 2540D | 11-21-17 | 11-22-17 | |

| | | | | | | |
|------------------------|-----------------------|-----|----------|----------|----------|--|
| Client ID: | TYLMI-20171119 | | | | | |
| Laboratory ID: | 11-240-13 | | | | | |
| Total Suspended Solids | 5.6 | 1.0 | SM 2540D | 11-21-17 | 11-22-17 | |

| | | | | | | |
|------------------------|-----------------------|-----|----------|----------|----------|--|
| Client ID: | TYLMO-20171119 | | | | | |
| Laboratory ID: | 11-240-14 | | | | | |
| Total Suspended Solids | 25 | 1.0 | SM 2540D | 11-21-17 | 11-22-17 | |



Date of Report: December 8, 2017
Samples Submitted: November 20, 2017
Laboratory Reference: 1711-240
Project: 14-05806-000

TOTAL SUSPENDED SOLIDS
SM 2540D

Matrix: Water
Units: mg/L

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|------------------------|----------------------|------------|---------------|----------------------|----------------------|--------------|
| Client ID: | QA36-20171119 | | | | | |
| Laboratory ID: | 11-240-15 | | | | | |
| Total Suspended Solids | 50 | 1.0 | SM 2540D | 11-21-17 | 11-22-17 | |



Date of Report: December 8, 2017
 Samples Submitted: November 20, 2017
 Laboratory Reference: 1711-240
 Project: 14-05806-000

**TOTAL SUSPENDED SOLIDS
 SM 2540D
 QUALITY CONTROL**

Matrix: Water
 Units: mg/L

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|------------------------|-----------|-----|----------|---------------|---------------|-------|
| METHOD BLANK | | | | | | |
| Laboratory ID: | MB1121W1 | | | | | |
| Total Suspended Solids | ND | 1.0 | SM 2540D | 11-21-17 | 11-22-17 | |

| Analyte | Result | Spike Level | Source Result | Percent Recovery | Recovery Limits | RPD | RPD Limit | Flags |
|------------------------|-------------|-------------|---------------|------------------|-----------------|-----|-----------|-------|
| DUPLICATE | | | | | | | | |
| Laboratory ID: | 11-240-02 | | | | | | | |
| | ORIG | DUP | | | | | | |
| Total Suspended Solids | 39.0 | 43.5 | NA | NA | NA | NA | 11 | 17 |

| | | | | | | | | |
|------------------------|-------------|-----|----|----|--------|----|----|--|
| SPIKE BLANK | | | | | | | | |
| Laboratory ID: | SB1121W1 | | | | | | | |
| | SB | SB | | SB | | | | |
| Total Suspended Solids | 94.0 | 100 | NA | 94 | 76-114 | NA | NA | |



Date of Report: December 8, 2017
 Samples Submitted: November 20, 2017
 Laboratory Reference: 1711-240
 Project: 14-05806-000

TURBIDITY
EPA 180.1

Matrix: Water
 Units: NTU

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|-------------------|----------------------|------|-----------|---------------|---------------|-------|
| Client ID: | COLM-20171119 | | | | | |
| Laboratory ID: | 11-240-01 | | | | | |
| Turbidity | 0.40 | 0.10 | EPA 180.1 | 11-21-17 | 11-21-17 | |

| | | | | | | |
|-------------------|-----------------------|------|-----------|----------|----------|--|
| Client ID: | COUMI-20171119 | | | | | |
| Laboratory ID: | 11-240-02 | | | | | |
| Turbidity | 18 | 0.10 | EPA 180.1 | 11-21-17 | 11-21-17 | |

| | | | | | | |
|-------------------|-----------------------|------|-----------|----------|----------|--|
| Client ID: | COUMO-20171119 | | | | | |
| Laboratory ID: | 11-240-03 | | | | | |
| Turbidity | 9.7 | 0.10 | EPA 180.1 | 11-21-17 | 11-21-17 | |

| | | | | | | |
|-------------------|-----------------------|------|-----------|----------|----------|--|
| Client ID: | EVAMS-20171119 | | | | | |
| Laboratory ID: | 11-240-04 | | | | | |
| Turbidity | 0.67 | 0.10 | EPA 180.1 | 11-21-17 | 11-21-17 | |

| | | | | | | |
|-------------------|------------------------|------|-----------|----------|----------|--|
| Client ID: | EVALSS-20171119 | | | | | |
| Laboratory ID: | 11-240-05 | | | | | |
| Turbidity | 1.2 | 0.10 | EPA 180.1 | 11-21-17 | 11-21-17 | |

| | | | | | | |
|-------------------|-----------------------|------|-----------|----------|----------|--|
| Client ID: | MONMN-20171119 | | | | | |
| Laboratory ID: | 11-240-06 | | | | | |
| Turbidity | 2.2 | 0.10 | EPA 180.1 | 11-21-17 | 11-21-17 | |

| | | | | | | |
|-------------------|-----------------------|------|-----------|----------|----------|--|
| Client ID: | MONMS-20171119 | | | | | |
| Laboratory ID: | 11-240-07 | | | | | |
| Turbidity | 2.4 | 0.10 | EPA 180.1 | 11-21-17 | 11-21-17 | |



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TURBIDITY
EPA 180.1

Matrix: Water
 Units: NTU

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|-------------------|----------------------|------|-----------|---------------|---------------|-------|
| Client ID: | MONM-20171119 | | | | | |
| Laboratory ID: | 11-240-08 | | | | | |
| Turbidity | 4.5 | 0.10 | EPA 180.1 | 11-21-17 | 11-21-17 | |

| | | | | | | |
|-------------------|-----------------------|------|-----------|----------|----------|--|
| Client ID: | SEIMN-20171119 | | | | | |
| Laboratory ID: | 11-240-09 | | | | | |
| Turbidity | 1.6 | 0.10 | EPA 180.1 | 11-21-17 | 11-21-17 | |

| | | | | | | |
|-------------------|-----------------------|------|-----------|----------|----------|--|
| Client ID: | SEIMS-20171119 | | | | | |
| Laboratory ID: | 11-240-10 | | | | | |
| Turbidity | 1.9 | 0.10 | EPA 180.1 | 11-21-17 | 11-21-17 | |

| | | | | | | |
|-------------------|-----------------------|------|-----------|----------|----------|--|
| Client ID: | TOSMI-20171119 | | | | | |
| Laboratory ID: | 11-240-11 | | | | | |
| Turbidity | 1.8 | 0.10 | EPA 180.1 | 11-21-17 | 11-21-17 | |

| | | | | | | |
|-------------------|-----------------------|------|-----------|----------|----------|--|
| Client ID: | TOSMO-20171119 | | | | | |
| Laboratory ID: | 11-240-12 | | | | | |
| Turbidity | 8.7 | 0.10 | EPA 180.1 | 11-21-17 | 11-21-17 | |

| | | | | | | |
|-------------------|-----------------------|------|-----------|----------|----------|--|
| Client ID: | TYLMI-20171119 | | | | | |
| Laboratory ID: | 11-240-13 | | | | | |
| Turbidity | 6.5 | 0.10 | EPA 180.1 | 11-21-17 | 11-21-17 | |

| | | | | | | |
|-------------------|-----------------------|------|-----------|----------|----------|--|
| Client ID: | TYLMO-20171119 | | | | | |
| Laboratory ID: | 11-240-14 | | | | | |
| Turbidity | 3.5 | 0.10 | EPA 180.1 | 11-21-17 | 11-21-17 | |



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TURBIDITY
EPA 180.1

Matrix: Water
Units: NTU

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|-------------------|----------------------|------------|---------------|----------------------|----------------------|--------------|
| Client ID: | QA36-20171119 | | | | | |
| Laboratory ID: | 11-240-15 | | | | | |
| Turbidity | 12 | 0.10 | EPA 180.1 | 11-21-17 | 11-21-17 | |



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**TURBIDITY
 EPA 180.1
 QUALITY CONTROL**

Matrix: Water
 Units: NTU

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|---------------------|-----------|------|-----------|---------------|---------------|-------|
| METHOD BLANK | | | | | | |
| Laboratory ID: | MB1121W1 | | | | | |
| Turbidity | ND | 0.10 | EPA 180.1 | 11-21-17 | 11-21-17 | |

| Analyte | Result | Spike Level | Source Result | Percent Recovery | Recovery Limits | RPD | RPD Limit | Flags |
|------------------|--------------|--------------|---------------|------------------|-----------------|-----|-----------|-------|
| DUPLICATE | | | | | | | | |
| Laboratory ID: | 11-240-01 | | | | | | | |
| | ORIG | DUP | | | | | | |
| Turbidity | 0.400 | 0.400 | NA | NA | NA | NA | 0 | 15 |



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HARDNESS
EPA 200.7/SM 2340B

Matrix: Water
 Units: mg eqt. CaCO₃/L (ppm)

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|-------------------|----------------------|-----|----------------|---------------|---------------|-------|
| Client ID: | COLM-20171119 | | | | | |
| Laboratory ID: | 11-240-01 | | | | | |
| Hardness | 13 | 1.0 | 200.7/SM 2340B | 11-21-17 | 11-21-17 | |

| | | | | | | |
|-------------------|-----------------------|-----|----------------|----------|----------|--|
| Client ID: | COUMI-20171119 | | | | | |
| Laboratory ID: | 11-240-02 | | | | | |
| Hardness | 110 | 1.0 | 200.7/SM 2340B | 11-21-17 | 11-21-17 | |

| | | | | | | |
|-------------------|-----------------------|-----|----------------|----------|----------|--|
| Client ID: | COUMO-20171119 | | | | | |
| Laboratory ID: | 11-240-03 | | | | | |
| Hardness | 83 | 1.0 | 200.7/SM 2340B | 11-21-17 | 11-21-17 | |

| | | | | | | |
|-------------------|-----------------------|-----|----------------|----------|----------|--|
| Client ID: | EVAMS-20171119 | | | | | |
| Laboratory ID: | 11-240-04 | | | | | |
| Hardness | 89 | 1.0 | 200.7/SM 2340B | 11-21-17 | 11-21-17 | |

| | | | | | | |
|-------------------|------------------------|-----|----------------|----------|----------|--|
| Client ID: | EVALSS-20171119 | | | | | |
| Laboratory ID: | 11-240-05 | | | | | |
| Hardness | 89 | 1.0 | 200.7/SM 2340B | 11-21-17 | 11-21-17 | |

| | | | | | | |
|-------------------|-----------------------|-----|----------------|----------|----------|--|
| Client ID: | MONMN-20171119 | | | | | |
| Laboratory ID: | 11-240-06 | | | | | |
| Hardness | 100 | 1.0 | 200.7/SM 2340B | 11-21-17 | 11-21-17 | |

| | | | | | | |
|-------------------|-----------------------|-----|----------------|----------|----------|--|
| Client ID: | MONMS-20171119 | | | | | |
| Laboratory ID: | 11-240-07 | | | | | |
| Hardness | 130 | 5.0 | 200.7/SM 2340B | 11-21-17 | 11-21-17 | |



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HARDNESS
EPA 200.7/SM 2340B

Matrix: Water
 Units: mg eqt. CaCO₃/L (ppm)

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|-------------------|----------------------|-----|----------------|---------------|---------------|-------|
| Client ID: | MONM-20171119 | | | | | |
| Laboratory ID: | 11-240-08 | | | | | |
| Hardness | 85 | 1.0 | 200.7/SM 2340B | 11-21-17 | 11-21-17 | |

| | | | | | | |
|-------------------|-----------------------|-----|----------------|----------|----------|--|
| Client ID: | SEIMN-20171119 | | | | | |
| Laboratory ID: | 11-240-09 | | | | | |
| Hardness | 33 | 1.0 | 200.7/SM 2340B | 11-21-17 | 11-21-17 | |

| | | | | | | |
|-------------------|-----------------------|-----|----------------|----------|----------|--|
| Client ID: | SEIMS-20171119 | | | | | |
| Laboratory ID: | 11-240-10 | | | | | |
| Hardness | 50 | 1.0 | 200.7/SM 2340B | 11-21-17 | 11-21-17 | |

| | | | | | | |
|-------------------|-----------------------|-----|----------------|----------|----------|--|
| Client ID: | TOSMI-20171119 | | | | | |
| Laboratory ID: | 11-240-11 | | | | | |
| Hardness | 58 | 1.0 | 200.7/SM 2340B | 11-21-17 | 11-21-17 | |

| | | | | | | |
|-------------------|-----------------------|-----|----------------|----------|----------|--|
| Client ID: | TOSMO-20171119 | | | | | |
| Laboratory ID: | 11-240-12 | | | | | |
| Hardness | 110 | 5.0 | 200.7/SM 2340B | 11-21-17 | 11-21-17 | |

| | | | | | | |
|-------------------|-----------------------|-----|----------------|----------|----------|--|
| Client ID: | TYLMI-20171119 | | | | | |
| Laboratory ID: | 11-240-13 | | | | | |
| Hardness | 73 | 1.0 | 200.7/SM 2340B | 11-21-17 | 11-21-17 | |

| | | | | | | |
|-------------------|-----------------------|-----|----------------|----------|----------|--|
| Client ID: | TYLMO-20171119 | | | | | |
| Laboratory ID: | 11-240-14 | | | | | |
| Hardness | 50 | 1.0 | 200.7/SM 2340B | 11-21-17 | 11-21-17 | |



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HARDNESS
EPA 200.7/SM 2340B

Matrix: Water
Units: mg eqt. CaCO₃/L (ppm)

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|-------------------|----------------------|------------|----------------|----------------------|----------------------|--------------|
| Client ID: | QA36-20171119 | | | | | |
| Laboratory ID: | 11-240-15 | | | | | |
| Hardness | 46 | 1.0 | 200.7/SM 2340B | 11-21-17 | 11-21-17 | |



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**HARDNESS
 EPA 200.7/SM 2340B
 QUALITY CONTROL**

Matrix: Water
 Units: mg eqt. CaCO₃/L (ppm)

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|---------------------|-----------|-----|----------------|---------------|---------------|-------|
| METHOD BLANK | | | | | | |
| Laboratory ID: | MB1121WH1 | | | | | |
| Hardness | ND | 1.0 | 200.7/SM 2340B | 11-21-17 | 11-21-17 | |

| Analyte | Result | Spike Level | Source Result | Percent Recovery | Recovery Limits | RPD | RPD Limit | Flags |
|------------------|-------------|-------------|---------------|------------------|-----------------|-----|-----------|-------|
| DUPLICATE | | | | | | | | |
| Laboratory ID: | 11-240-01 | | | | | | | |
| | ORIG | DUP | | | | | | |
| Hardness | 12.6 | 12.4 | NA | NA | NA | 2 | 20 | |

| Analyte | Result | Spike Level | Source Result | Percent Recovery | Recovery Limits | RPD | RPD Limit | Flags | | |
|----------------------|------------|-------------|---------------|------------------|-----------------|-----|-----------|--------|---|----|
| MATRIX SPIKES | | | | | | | | | | |
| Laboratory ID: | 11-240-01 | | | | | | | | | |
| | MS | MSD | MS | MSD | MS | MSD | | | | |
| Hardness | 150 | 148 | 132 | 132 | 12.6 | 104 | 103 | 75-125 | 1 | 20 |

| Analyte | Result | Spike Level | Source Result | Percent Recovery | Recovery Limits | RPD | RPD Limit | Flags | |
|--------------------|------------|-------------|---------------|------------------|-----------------|-----|-----------|-------|----|
| SPIKE BLANK | | | | | | | | | |
| Laboratory ID: | SB1121WH1 | | | | | | | | |
| | SB | | SB | | SB | | | | |
| Hardness | 132 | | 132 | | 100 | | 80-120 | NA | NA |



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**DISSOLVED ORGANIC CARBON
 SM 5310B**

Matrix: Water
 Units: mg/L

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|--------------------------|------------------------|-----|----------|---------------|---------------|-------|
| Client ID: | COLM-20171119 | | | | | |
| Laboratory ID: | 11-240-01 | | | | | |
| Dissolved Organic Carbon | 15 | 1.0 | SM 5310B | 11-29-17 | 11-29-17 | |
| Client ID: | COUMI-20171119 | | | | | |
| Laboratory ID: | 11-240-02 | | | | | |
| Dissolved Organic Carbon | 11 | 1.0 | SM 5310B | 11-29-17 | 11-29-17 | |
| Client ID: | COUMO-20171119 | | | | | |
| Laboratory ID: | 11-240-03 | | | | | |
| Dissolved Organic Carbon | 8.4 | 1.0 | SM 5310B | 11-29-17 | 11-29-17 | |
| Client ID: | EVAMS-20171119 | | | | | |
| Laboratory ID: | 11-240-04 | | | | | |
| Dissolved Organic Carbon | 5.0 | 1.0 | SM 5310B | 11-29-17 | 11-29-17 | |
| Client ID: | EVALSS-20171119 | | | | | |
| Laboratory ID: | 11-240-05 | | | | | |
| Dissolved Organic Carbon | 4.6 | 1.0 | SM 5310B | 11-29-17 | 11-29-17 | |
| Client ID: | MONMN-20171119 | | | | | |
| Laboratory ID: | 11-240-06 | | | | | |
| Dissolved Organic Carbon | 4.5 | 1.0 | SM 5310B | 11-29-17 | 11-29-17 | |
| Client ID: | MONMS-20171119 | | | | | |
| Laboratory ID: | 11-240-07 | | | | | |
| Dissolved Organic Carbon | 6.0 | 1.0 | SM 5310B | 11-29-17 | 11-29-17 | |



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**DISSOLVED ORGANIC CARBON
 SM 5310B**

Matrix: Water
 Units: mg/L

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|--------------------------|-----------------------|-----|----------|---------------|---------------|-------|
| Client ID: | MONM-20171119 | | | | | |
| Laboratory ID: | 11-240-08 | | | | | |
| Dissolved Organic Carbon | 5.4 | 1.0 | SM 5310B | 11-29-17 | 11-29-17 | |
| Client ID: | SEIMN-20171119 | | | | | |
| Laboratory ID: | 11-240-09 | | | | | |
| Dissolved Organic Carbon | 6.4 | 1.0 | SM 5310B | 11-29-17 | 11-29-17 | |
| Client ID: | SEIMS-20171119 | | | | | |
| Laboratory ID: | 11-240-10 | | | | | |
| Dissolved Organic Carbon | 5.8 | 1.0 | SM 5310B | 11-29-17 | 11-29-17 | |
| Client ID: | TOSMI-20171119 | | | | | |
| Laboratory ID: | 11-240-11 | | | | | |
| Dissolved Organic Carbon | 12 | 1.0 | SM 5310B | 11-29-17 | 11-29-17 | |
| Client ID: | TOSMO-20171119 | | | | | |
| Laboratory ID: | 11-240-12 | | | | | |
| Dissolved Organic Carbon | 6.6 | 1.0 | SM 5310B | 11-29-17 | 11-29-17 | |
| Client ID: | TYLMI-20171119 | | | | | |
| Laboratory ID: | 11-240-13 | | | | | |
| Dissolved Organic Carbon | 6.3 | 1.0 | SM 5310B | 11-29-17 | 11-29-17 | |
| Client ID: | TYLMO-20171119 | | | | | |
| Laboratory ID: | 11-240-14 | | | | | |
| Dissolved Organic Carbon | 6.1 | 1.0 | SM 5310B | 11-29-17 | 11-29-17 | |



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**DISSOLVED ORGANIC CARBON
SM 5310B**

Matrix: Water
Units: mg/L

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|--------------------------|----------------------|------------|---------------|----------------------|----------------------|--------------|
| Client ID: | QA36-20171119 | | | | | |
| Laboratory ID: | 11-240-15 | | | | | |
| Dissolved Organic Carbon | 6.6 | 1.0 | SM 5310B | 11-29-17 | 11-29-17 | |



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**DISSOLVED ORGANIC CARBON
 SM 5310B
 QUALITY CONTROL**

Matrix: Water
 Units: mg/L

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|--------------------------|-----------|-----|----------|---------------|---------------|-------|
| METHOD BLANK | | | | | | |
| Laboratory ID: | MB1129D1 | | | | | |
| Dissolved Organic Carbon | ND | 1.0 | SM 5310B | 11-29-17 | 11-29-17 | |

| Analyte | Result | Spike Level | Source Result | Percent Recovery | Recovery Limits | RPD | RPD Limit | Flags |
|--------------------------|-------------|-------------|---------------|------------------|-----------------|-----|-----------|-------|
| DUPLICATE | | | | | | | | |
| Laboratory ID: | 11-240-01 | | | | | | | |
| | ORIG | DUP | | | | | | |
| Dissolved Organic Carbon | 15.5 | 15.5 | NA | NA | NA | 0 | 15 | |

MATRIX SPIKE

| | | | | | | | | |
|--------------------------|-------------|------|------|----|--------|----|----|--|
| Laboratory ID: | 11-240-01 | | | | | | | |
| | MS | MS | | MS | | | | |
| Dissolved Organic Carbon | 24.3 | 10.0 | 15.5 | 88 | 75-125 | NA | NA | |

SPIKE BLANK

| | | | | | | | | |
|--------------------------|-------------|------|----|-----|--------|----|----|--|
| Laboratory ID: | SB1129D1 | | | | | | | |
| | SB | SB | | SB | | | | |
| Dissolved Organic Carbon | 10.2 | 10.0 | NA | 102 | 80-120 | NA | NA | |



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TOTAL PHOSPHORUS
EPA 365.1

Matrix: Water
 Units: mg/L

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|-------------------|----------------------|-------|-----------|---------------|---------------|-------|
| Client ID: | COLM-20171119 | | | | | |
| Laboratory ID: | 11-240-01 | | | | | |
| Total Phosphorus | 0.012 | 0.010 | EPA 365.1 | 11-28-17 | 11-28-17 | |

| | | | | | | |
|-------------------|-----------------------|-------|-----------|----------|----------|--|
| Client ID: | COUMI-20171119 | | | | | |
| Laboratory ID: | 11-240-02 | | | | | |
| Total Phosphorus | 0.14 | 0.010 | EPA 365.1 | 11-28-17 | 11-28-17 | |

| | | | | | | |
|-------------------|-----------------------|-------|-----------|----------|----------|--|
| Client ID: | COUMO-20171119 | | | | | |
| Laboratory ID: | 11-240-03 | | | | | |
| Total Phosphorus | 0.084 | 0.010 | EPA 365.1 | 11-28-17 | 11-28-17 | |

| | | | | | | |
|-------------------|-----------------------|-------|-----------|----------|----------|--|
| Client ID: | EVAMS-20171119 | | | | | |
| Laboratory ID: | 11-240-04 | | | | | |
| Total Phosphorus | 0.011 | 0.010 | EPA 365.1 | 11-28-17 | 11-28-17 | |

| | | | | | | |
|-------------------|------------------------|-------|-----------|----------|----------|--|
| Client ID: | EVALSS-20171119 | | | | | |
| Laboratory ID: | 11-240-05 | | | | | |
| Total Phosphorus | 0.019 | 0.010 | EPA 365.1 | 11-28-17 | 11-28-17 | |

| | | | | | | |
|-------------------|-----------------------|-------|-----------|----------|----------|--|
| Client ID: | MONMN-20171119 | | | | | |
| Laboratory ID: | 11-240-06 | | | | | |
| Total Phosphorus | 0.032 | 0.010 | EPA 365.1 | 11-28-17 | 11-28-17 | |

| | | | | | | |
|-------------------|-----------------------|-------|-----------|----------|----------|--|
| Client ID: | MONMS-20171119 | | | | | |
| Laboratory ID: | 11-240-07 | | | | | |
| Total Phosphorus | 0.043 | 0.010 | EPA 365.1 | 11-28-17 | 11-28-17 | |



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TOTAL PHOSPHORUS
EPA 365.1

Matrix: Water
 Units: mg/L

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|-------------------|----------------------|-------|-----------|---------------|---------------|-------|
| Client ID: | MONM-20171119 | | | | | |
| Laboratory ID: | 11-240-08 | | | | | |
| Total Phosphorus | 0.044 | 0.010 | EPA 365.1 | 11-28-17 | 11-28-17 | |

| | | | | | | |
|-------------------|-----------------------|-------|-----------|----------|----------|--|
| Client ID: | SEIMN-20171119 | | | | | |
| Laboratory ID: | 11-240-09 | | | | | |
| Total Phosphorus | 0.023 | 0.010 | EPA 365.1 | 11-28-17 | 11-28-17 | |

| | | | | | | |
|-------------------|-----------------------|-------|-----------|----------|----------|--|
| Client ID: | SEIMS-20171119 | | | | | |
| Laboratory ID: | 11-240-10 | | | | | |
| Total Phosphorus | 0.043 | 0.010 | EPA 365.1 | 11-28-17 | 11-28-17 | |

| | | | | | | |
|-------------------|-----------------------|-------|-----------|----------|----------|--|
| Client ID: | TOSMI-20171119 | | | | | |
| Laboratory ID: | 11-240-11 | | | | | |
| Total Phosphorus | 0.089 | 0.010 | EPA 365.1 | 11-28-17 | 11-28-17 | |

| | | | | | | |
|-------------------|-----------------------|-------|-----------|----------|----------|--|
| Client ID: | TOSMO-20171119 | | | | | |
| Laboratory ID: | 11-240-12 | | | | | |
| Total Phosphorus | 0.074 | 0.010 | EPA 365.1 | 11-28-17 | 11-28-17 | |

| | | | | | | |
|-------------------|-----------------------|-------|-----------|----------|----------|--|
| Client ID: | TYLMI-20171119 | | | | | |
| Laboratory ID: | 11-240-13 | | | | | |
| Total Phosphorus | 0.030 | 0.010 | EPA 365.1 | 11-28-17 | 11-28-17 | |

| | | | | | | |
|-------------------|-----------------------|-------|-----------|----------|----------|--|
| Client ID: | TYLMO-20171119 | | | | | |
| Laboratory ID: | 11-240-14 | | | | | |
| Total Phosphorus | 0.086 | 0.010 | EPA 365.1 | 11-28-17 | 11-28-17 | |



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TOTAL PHOSPHORUS
EPA 365.1

Matrix: Water
Units: mg/L

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|-------------------|----------------------|------------|---------------|----------------------|----------------------|--------------|
| Client ID: | QA36-20171119 | | | | | |
| Laboratory ID: | 11-240-15 | | | | | |
| Total Phosphorus | 0.089 | 0.010 | EPA 365.1 | 11-28-17 | 11-28-17 | |



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**TOTAL PHOSPHORUS
 EPA 365.1
 QUALITY CONTROL**

Matrix: Water
 Units: mg/L

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|---------------------|-----------|-------|-----------|---------------|---------------|-------|
| METHOD BLANK | | | | | | |
| Laboratory ID: | MB1128W1 | | | | | |
| Total Phosphorus | ND | 0.010 | EPA 365.1 | 11-28-17 | 11-28-17 | |

| Analyte | Result | Spike Level | Source Result | Percent Recovery | Recovery Limits | RPD | RPD Limit | Flags |
|------------------|---------------|---------------|---------------|------------------|-----------------|-----|-----------|-------|
| DUPLICATE | | | | | | | | |
| Laboratory ID: | 11-240-01 | | | | | | | |
| | ORIG | DUP | | | | | | |
| Total Phosphorus | 0.0122 | 0.0124 | NA | NA | NA | 2 | 11 | |

| | | | | | | | | |
|---------------------|--------------|-------|--------|----|--------|----|----|--|
| MATRIX SPIKE | | | | | | | | |
| Laboratory ID: | 11-240-01 | | | | | | | |
| | MS | MS | | MS | | | | |
| Total Phosphorus | 0.255 | 0.250 | 0.0122 | 97 | 82-124 | NA | NA | |

| | | | | | | | | |
|--------------------|--------------|-------|----|----|--------|----|----|--|
| SPIKE BLANK | | | | | | | | |
| Laboratory ID: | SB1128W1 | | | | | | | |
| | SB | SB | | SB | | | | |
| Total Phosphorus | 0.240 | 0.250 | NA | 96 | 87-114 | NA | NA | |



Date of Report: December 8, 2017
 Samples Submitted: November 20, 2017
 Laboratory Reference: 1711-240
 Project: 14-05806-000

**TOTAL METALS
 EPA 200.8**

Matrix: Water
 Units: ug/L (ppb)

| Analyte | Result | PQL | EPA Method | Date Prepared | Date Analyzed | Flags |
|-----------------------------------|--------|-----|------------|---------------|---------------|-------|
| Lab ID: 11-240-01 | | | | | | |
| Client ID: COLM-20171119 | | | | | | |
| Copper | 1.4 | 1.0 | 200.8 | 11-28-17 | 11-28-17 | |
| Zinc | ND | 5.0 | 200.8 | 11-28-17 | 11-28-17 | |
| Lab ID: 11-240-02 | | | | | | |
| Client ID: COUMI-20171119 | | | | | | |
| Copper | 3.7 | 1.0 | 200.8 | 11-28-17 | 11-28-17 | |
| Zinc | 25 | 5.0 | 200.8 | 11-28-17 | 11-28-17 | |
| Lab ID: 11-240-03 | | | | | | |
| Client ID: COUMO-20171119 | | | | | | |
| Copper | 4.0 | 1.0 | 200.8 | 11-28-17 | 11-28-17 | |
| Zinc | 30 | 5.0 | 200.8 | 11-28-17 | 11-28-17 | |
| Lab ID: 11-240-04 | | | | | | |
| Client ID: EVAMS-20171119 | | | | | | |
| Copper | ND | 1.0 | 200.8 | 11-28-17 | 11-28-17 | |
| Zinc | ND | 5.0 | 200.8 | 11-28-17 | 11-28-17 | |
| Lab ID: 11-240-05 | | | | | | |
| Client ID: EVALSS-20171119 | | | | | | |
| Copper | ND | 1.0 | 200.8 | 11-28-17 | 11-28-17 | |
| Zinc | ND | 5.0 | 200.8 | 11-28-17 | 11-28-17 | |
| Lab ID: 11-240-06 | | | | | | |
| Client ID: MONMN-20171119 | | | | | | |
| Copper | 1.2 | 1.0 | 200.8 | 11-28-17 | 11-28-17 | |
| Zinc | 6.9 | 5.0 | 200.8 | 11-28-17 | 11-28-17 | |



Date of Report: December 8, 2017
 Samples Submitted: November 20, 2017
 Laboratory Reference: 1711-240
 Project: 14-05806-000

**TOTAL METALS
 EPA 200.8**

Matrix: Water
 Units: ug/L (ppb)

| Analyte | Result | PQL | EPA Method | Date Prepared | Date Analyzed | Flags |
|-------------------|-----------------------|------------|-------------------|----------------------|----------------------|--------------|
| Lab ID: | 11-240-07 | | | | | |
| Client ID: | MONMS-20171119 | | | | | |
| Copper | 1.8 | 1.0 | 200.8 | 11-28-17 | 11-28-17 | |
| Zinc | ND | 5.0 | 200.8 | 11-28-17 | 11-28-17 | |
| Lab ID: | 11-240-08 | | | | | |
| Client ID: | MONM-20171119 | | | | | |
| Copper | 1.5 | 1.0 | 200.8 | 11-28-17 | 11-28-17 | |
| Zinc | 13 | 5.0 | 200.8 | 11-28-17 | 11-28-17 | |
| Lab ID: | 11-240-09 | | | | | |
| Client ID: | SEIMN-20171119 | | | | | |
| Copper | 1.1 | 1.0 | 200.8 | 11-28-17 | 11-28-17 | |
| Zinc | ND | 5.0 | 200.8 | 11-28-17 | 11-28-17 | |
| Lab ID: | 11-240-10 | | | | | |
| Client ID: | SEIMS-20171119 | | | | | |
| Copper | ND | 1.0 | 200.8 | 11-28-17 | 11-28-17 | |
| Zinc | ND | 5.0 | 200.8 | 11-28-17 | 11-28-17 | |
| Lab ID: | 11-240-11 | | | | | |
| Client ID: | TOSMI-20171119 | | | | | |
| Copper | 6.8 | 1.0 | 200.8 | 11-28-17 | 11-28-17 | |
| Zinc | 38 | 5.0 | 200.8 | 11-28-17 | 11-28-17 | |
| Lab ID: | 11-240-12 | | | | | |
| Client ID: | TOSMO-20171119 | | | | | |
| Copper | 4.2 | 1.0 | 200.8 | 11-28-17 | 11-28-17 | |
| Zinc | 18 | 5.0 | 200.8 | 11-28-17 | 11-28-17 | |



Date of Report: December 8, 2017
 Samples Submitted: November 20, 2017
 Laboratory Reference: 1711-240
 Project: 14-05806-000

TOTAL METALS
EPA 200.8

Matrix: Water
 Units: ug/L (ppb)

| Analyte | Result | PQL | EPA Method | Date Prepared | Date Analyzed | Flags |
|-------------------|-----------------------|------------|-------------------|----------------------|----------------------|--------------|
| Lab ID: | 11-240-13 | | | | | |
| Client ID: | TYLMI-20171119 | | | | | |
| Copper | 3.1 | 1.0 | 200.8 | 11-28-17 | 11-28-17 | |
| Zinc | 6.2 | 5.0 | 200.8 | 11-28-17 | 11-28-17 | |

| | | | | | | |
|-------------------|-----------------------|-----|-------|----------|----------|--|
| Lab ID: | 11-240-14 | | | | | |
| Client ID: | TYLMO-20171119 | | | | | |
| Copper | 11 | 1.0 | 200.8 | 11-28-17 | 11-28-17 | |
| Zinc | 52 | 5.0 | 200.8 | 11-28-17 | 11-28-17 | |

| | | | | | | |
|-------------------|----------------------|-----|-------|----------|----------|--|
| Lab ID: | 11-240-15 | | | | | |
| Client ID: | QA36-20171119 | | | | | |
| Copper | 8.3 | 1.0 | 200.8 | 11-28-17 | 11-28-17 | |
| Zinc | 28 | 5.0 | 200.8 | 11-28-17 | 11-28-17 | |



Date of Report: December 8, 2017
Samples Submitted: November 20, 2017
Laboratory Reference: 1711-240
Project: 14-05806-000

**TOTAL METALS
EPA 200.8
METHOD BLANK QUALITY CONTROL**

Date Extracted: 11-28-17
Date Analyzed: 11-28-17

Matrix: Water
Units: ug/L (ppb)

Lab ID: MB1128WH1

| Analyte | Method | Result | PQL |
|---------|--------|-----------|-----|
| Copper | 200.8 | ND | 1.0 |
| Zinc | 200.8 | ND | 5.0 |



Date of Report: December 8, 2017
Samples Submitted: November 20, 2017
Laboratory Reference: 1711-240
Project: 14-05806-000

**TOTAL METALS
EPA 200.8
DUPLICATE QUALITY CONTROL**

Date Extracted: 11-28-17
Date Analyzed: 11-28-17

Matrix: Water
Units: ug/L (ppb)

Lab ID: 11-240-04

| Analyte | Sample Result | Duplicate Result | RPD | PQL | Flags |
|---------|---------------|------------------|-----|-----|-------|
| Copper | ND | ND | NA | 1.0 | |
| Zinc | ND | ND | NA | 5.0 | |



Date of Report: December 8, 2017
 Samples Submitted: November 20, 2017
 Laboratory Reference: 1711-240
 Project: 14-05806-000

**TOTAL METALS
 EPA 200.8
 MS/MSD QUALITY CONTROL**

Date Extracted: 11-28-17

Date Analyzed: 11-28-17

Matrix: Water

Units: ug/L (ppb)

Lab ID: 11-240-04

| Analyte | Spike Level | MS | Percent Recovery | MSD | Percent Recovery | RPD | Flags |
|---------|-------------|------------|------------------|------------|------------------|-----|-------|
| Copper | 100 | 101 | 101 | 103 | 103 | 2 | |
| Zinc | 100 | 107 | 107 | 113 | 113 | 5 | |



Date of Report: December 8, 2017
 Samples Submitted: November 20, 2017
 Laboratory Reference: 1711-240
 Project: 14-05806-000

**DISSOLVED METALS
 EPA 200.8**

Matrix: Water
 Units: ug/L (ppb)

| Analyte | Result | PQL | EPA Method | Date Prepared | Date Analyzed | Flags |
|-----------------------------------|--------|-----|------------|---------------|---------------|-------|
| Lab ID: 11-240-01 | | | | | | |
| Client ID: COLM-20171119 | | | | | | |
| Copper | 1.2 | 1.0 | 200.8 | | 11-21-17 | |
| Zinc | ND | 5.0 | 200.8 | | 11-21-17 | |
| Lab ID: 11-240-02 | | | | | | |
| Client ID: COUMI-20171119 | | | | | | |
| Copper | 2.3 | 1.0 | 200.8 | | 11-21-17 | |
| Zinc | 12 | 5.0 | 200.8 | | 11-21-17 | |
| Lab ID: 11-240-03 | | | | | | |
| Client ID: COUMO-20171119 | | | | | | |
| Copper | 2.5 | 1.0 | 200.8 | | 11-21-17 | |
| Zinc | 19 | 5.0 | 200.8 | | 11-21-17 | |
| Lab ID: 11-240-04 | | | | | | |
| Client ID: EVAMS-20171119 | | | | | | |
| Copper | ND | 1.0 | 200.8 | | 11-21-17 | |
| Zinc | ND | 5.0 | 200.8 | | 11-21-17 | |
| Lab ID: 11-240-05 | | | | | | |
| Client ID: EVALSS-20171119 | | | | | | |
| Copper | ND | 1.0 | 200.8 | | 11-21-17 | |
| Zinc | ND | 5.0 | 200.8 | | 11-21-17 | |
| Lab ID: 11-240-06 | | | | | | |
| Client ID: MONMN-20171119 | | | | | | |
| Copper | 1.1 | 1.0 | 200.8 | | 11-21-17 | |
| Zinc | 5.4 | 5.0 | 200.8 | | 11-21-17 | |



OnSite Environmental, Inc. 14648 NE 95th Street, Redmond, WA 98052 (425) 883-3881

This report pertains to the samples analyzed in accordance with the chain of custody, and is intended only for the use of the individual or company to whom it is addressed.

Date of Report: December 8, 2017
 Samples Submitted: November 20, 2017
 Laboratory Reference: 1711-240
 Project: 14-05806-000

**DISSOLVED METALS
 EPA 200.8**

Matrix: Water
 Units: ug/L (ppb)

| Analyte | Result | PQL | EPA Method | Date Prepared | Date Analyzed | Flags |
|-------------------|-----------------------|-----|------------|---------------|---------------|-------|
| Lab ID: | 11-240-07 | | | | | |
| Client ID: | MONMS-20171119 | | | | | |
| Copper | 1.7 | 1.0 | 200.8 | | 11-21-17 | |
| Zinc | ND | 5.0 | 200.8 | | 11-21-17 | |
| Lab ID: | 11-240-08 | | | | | |
| Client ID: | MONM-20171119 | | | | | |
| Copper | ND | 1.0 | 200.8 | | 11-21-17 | |
| Zinc | 6.6 | 5.0 | 200.8 | | 11-21-17 | |
| Lab ID: | 11-240-09 | | | | | |
| Client ID: | SEIMN-20171119 | | | | | |
| Copper | ND | 1.0 | 200.8 | | 11-21-17 | |
| Zinc | ND | 5.0 | 200.8 | | 11-21-17 | |
| Lab ID: | 11-240-10 | | | | | |
| Client ID: | SEIMS-20171119 | | | | | |
| Copper | ND | 1.0 | 200.8 | | 11-21-17 | |
| Zinc | ND | 5.0 | 200.8 | | 11-21-17 | |
| Lab ID: | 11-240-11 | | | | | |
| Client ID: | TOSMI-20171119 | | | | | |
| Copper | 4.7 | 1.0 | 200.8 | | 11-21-17 | |
| Zinc | 23 | 5.0 | 200.8 | | 11-21-17 | |
| Lab ID: | 11-240-12 | | | | | |
| Client ID: | TOSMO-20171119 | | | | | |
| Copper | 2.8 | 1.0 | 200.8 | | 11-21-17 | |
| Zinc | 9.3 | 5.0 | 200.8 | | 11-21-17 | |



Date of Report: December 8, 2017
 Samples Submitted: November 20, 2017
 Laboratory Reference: 1711-240
 Project: 14-05806-000

**DISSOLVED METALS
 EPA 200.8**

Matrix: Water
 Units: ug/L (ppb)

| Analyte | Result | PQL | EPA Method | Date Prepared | Date Analyzed | Flags |
|-------------------|-----------------------|-----|------------|---------------|---------------|-------|
| Lab ID: | 11-240-13 | | | | | |
| Client ID: | TYLMI-20171119 | | | | | |
| Copper | 2.4 | 1.0 | 200.8 | | 11-21-17 | |
| Zinc | ND | 5.0 | 200.8 | | 11-21-17 | |
| Lab ID: | 11-240-14 | | | | | |
| Client ID: | TYLMO-20171119 | | | | | |
| Copper | 4.4 | 1.0 | 200.8 | | 11-21-17 | |
| Zinc | 6.6 | 5.0 | 200.8 | | 11-21-17 | |
| Lab ID: | 11-240-15 | | | | | |
| Client ID: | QA36-20171119 | | | | | |
| Copper | 5.1 | 1.0 | 200.8 | | 11-21-17 | |
| Zinc | 7.7 | 5.0 | 200.8 | | 11-21-17 | |



Date of Report: December 8, 2017
Samples Submitted: November 20, 2017
Laboratory Reference: 1711-240
Project: 14-05806-000

**DISSOLVED METALS
EPA 200.8
METHOD BLANK QUALITY CONTROL**

Date Analyzed: 11-21-17

Matrix: Water
Units: ug/L (ppb)

Lab ID: MB1121D1

| Analyte | Method | Result | PQL |
|---------|--------|-----------|-----|
| Copper | 200.8 | ND | 1.0 |
| Zinc | 200.8 | ND | 5.0 |



Date of Report: December 8, 2017
Samples Submitted: November 20, 2017
Laboratory Reference: 1711-240
Project: 14-05806-000

**DISSOLVED METALS
EPA 200.8
DUPLICATE QUALITY CONTROL**

Date Analyzed: 11-21-17

Matrix: Water
Units: ug/L (ppb)

Lab ID: 11-241-02

| Analyte | Sample Result | Duplicate Result | RPD | PQL | Flags |
|---------|------------------|---------------------|-----|-----|-------|
| Copper | 1.30 | 1.31 | 1 | 1.0 | |
| Zinc | 8.62 | 9.08 | 5 | 5.0 | |



Date of Report: December 8, 2017
 Samples Submitted: November 20, 2017
 Laboratory Reference: 1711-240
 Project: 14-05806-000

**DISSOLVED METALS
 EPA 200.8
 MS/MSD QUALITY CONTROL**

Date Analyzed: 11-21-17

Matrix: Water
 Units: ug/L (ppb)

Lab ID: 11-241-02

| Analyte | Spike Level | MS | Percent Recovery | MSD | Percent Recovery | RPD | Flags |
|---------|-------------|-------------|------------------|-------------|------------------|-----|-------|
| Copper | 80.0 | 70.4 | 86 | 70.6 | 87 | 0 | |
| Zinc | 80.0 | 89.2 | 101 | 89.4 | 101 | 0 | |





Data Qualifiers and Abbreviations

- A - Due to a high sample concentration, the amount spiked is insufficient for meaningful MS/MSD recovery data.
 - B - The analyte indicated was also found in the blank sample.
 - C - The duplicate RPD is outside control limits due to high result variability when analyte concentrations are within five times the quantitation limit.
 - E - The value reported exceeds the quantitation range and is an estimate.
 - F - Surrogate recovery data is not available due to the high concentration of coeluting target compounds.
 - H - The analyte indicated is a common laboratory solvent and may have been introduced during sample preparation, and be impacting the sample result.
 - I - Compound recovery is outside of the control limits.
 - J - The value reported was below the practical quantitation limit. The value is an estimate.
 - K - Sample duplicate RPD is outside control limits due to sample inhomogeneity. The sample was re-extracted and re-analyzed with similar results.
 - L - The RPD is outside of the control limits.
 - M - Hydrocarbons in the gasoline range are impacting the diesel range result.
 - M1 - Hydrocarbons in the gasoline range (toluene-naphthalene) are present in the sample.
 - N - Hydrocarbons in the lube oil range are impacting the diesel range result.
 - N1 - Hydrocarbons in diesel range are impacting lube oil range results.
 - O - Hydrocarbons indicative of heavier fuels are present in the sample and are impacting the gasoline result.
 - P - The RPD of the detected concentrations between the two columns is greater than 40.
 - Q - Surrogate recovery is outside of the control limits.
 - S - Surrogate recovery data is not available due to the necessary dilution of the sample.
 - T - The sample chromatogram is not similar to a typical _____.
 - U - The analyte was analyzed for, but was not detected above the reported sample quantitation limit.
 - U1 - The practical quantitation limit is elevated due to interferences present in the sample.
 - V - Matrix Spike/Matrix Spike Duplicate recoveries are outside control limits due to matrix effects.
 - W - Matrix Spike/Matrix Spike Duplicate RPD are outside control limits due to matrix effects.
 - X - Sample extract treated with a mercury cleanup procedure.
 - X1 - Sample extract treated with a sulfuric acid/silica gel cleanup procedure.
 - Y - The calibration verification for this analyte exceeded the 20% drift specified in method 8260C, and therefore the reported result should be considered an estimate. The overall performance of the calibration verification standard met the acceptance criteria of the method.
 - Z -
- ND - Not Detected at PQL
 PQL - Practical Quantitation Limit
 RPD - Relative Percent Difference





Am Test Inc.
13600 NE 126TH PL
Suite C
Kirkland, WA 98034
(425) 885-1664

*Professional
Analytical
Services*

Dec 8 2017
On-Site Environmental
14648 NE 95th ST
Redmond, WA 98052
Attention: David Baumeister

Dear David Baumeister:

Enclosed please find the analytical data for your REDMOND PAIRED WATERSHED STUDY project.

The following is a cross correlation of client and laboratory identifications for your convenience.

| CLIENT ID | MATRIX | AMTEST ID | TEST |
|-----------------|--------|------------|------------|
| COLM-20171119 | Water | 17-A020472 | Micro, NUT |
| COUMI-20171119 | Water | 17-A020473 | Micro, NUT |
| COUMO-20171119 | Water | 17-A020474 | Micro, NUT |
| EVAMS-20171119 | Water | 17-A020475 | Micro, NUT |
| EVALSS-20171119 | Water | 17-A020476 | Micro, NUT |
| MONMN-20171119 | Water | 17-A020477 | Micro, NUT |
| MONMS-20171119 | Water | 17-A020478 | Micro, NUT |
| MONM-20171119 | Water | 17-A020479 | Micro, NUT |
| SEIMN-20171119 | Water | 17-A020480 | Micro, NUT |
| SEIMS-20171119 | Water | 17-A020481 | Micro, NUT |
| TOSMI-20171119 | Water | 17-A020482 | Micro, NUT |
| TOSMO-20171119 | Water | 17-A020483 | Micro, NUT |
| TYLMI-20171119 | Water | 17-A020484 | Micro, NUT |
| TYLMO-20171119 | Water | 17-A020485 | Micro, NUT |
| QA-36--20171119 | Water | 17-A020486 | Micro, NUT |

Your samples were received on Monday, November 20, 2017. At the time of receipt, the samples were logged in and properly maintained prior to the subsequent analysis.

The analytical procedures used at AmTest are well documented and are typically derived from the protocols of the EPA, USDA, FDA or the Army Corps of Engineers.

Following the analytical data you will find the Quality Control (QC) results.

Please note that the detection limits that are listed in the body of the report refer to the Practical Quantitation Limits (PQL's), as opposed to the Method Detection Limits (MDL's).

Am Test Inc.
13600 NE 126TH PL
Suite C
Kirkland, WA 98034
(425) 885-1664

**Professional
Analytical
Services**

Dec 8 2017
On-Site Environmental
continued . . .

If you should have any questions pertaining to the data package, please feel free to contact me.

Sincerely,


Aaron W. Young
Laboratory Manager

Project #: 14-05806-000
PO Number: 11-240

BACT = Bacteriological
CONV = Conventional

MET = Metals
ORG = Organics

NUT=Nutrients
DEM=Demand

MIN=Minerals

Am Test Inc.
13600 NE 126TH PL
Suite C
Kirkland, WA 98034
(425) 885-1664
www.amtestlab.com



*Professional
Analytical
Services*

ANALYSIS REPORT

On-Site Environmental
14648 NE 95th ST
Redmond, WA 98052
Attention: David Baumeister
Project Name: REDMOND PAIRED WATERSHED STUDY
Project #: 14-05806-000
PO Number: 11-240
All results reported on an as received basis.

Date Received: 11/20/17
Date Reported: 12/ 8/17

AMTEST Identification Number 17-A020472
Client Identification COLM-20171119
Sampling Date 11/19/17, 21:05

Results

| PARAMETER | RESULT | UNITS | Q | D.L. | METHOD | ANALYST | DATE |
|--------------------------|--------|------------|---|------|-----------|---------|----------|
| Fecal Coliform | 10. | CFU/100 ml | | 10 | SM 9222D | JM | 11/20/17 |
| Total Nitrogen (NOX&TKN) | 0.94 | mg/l | | 0.1 | | | |
| Total Nitrogen (TKN) | 0.842 | mg/l | | 0.1 | SM4500N | JC | 12/05/17 |
| Nitrate + Nitrite | 0.096 | mg/l | | 0.01 | SM4500NO3 | JC | 11/30/17 |

AMTEST Identification Number 17-A020473
Client Identification COUMI-20171119
Sampling Date 11/19/17, 18:05

Results

| PARAMETER | RESULT | UNITS | Q | D.L. | METHOD | ANALYST | DATE |
|--------------------------|--------|------------|---|------|-----------|---------|----------|
| Fecal Coliform | 650 | CFU/100 ml | | 10 | SM 9222D | JM | 11/20/17 |
| Total Nitrogen (NOX&TKN) | 1.07 | mg/l | | 0.1 | | | |
| Total Nitrogen (TKN) | 0.857 | mg/l | | 0.1 | SM4500N | JC | 12/05/17 |
| Nitrate + Nitrite | 0.21 | mg/l | | 0.01 | SM4500NO3 | JC | 11/30/17 |

AMTEST Identification Number 17-A020474
Client Identification COUMO-20171119
Sampling Date 11/19/17, 17:50

Results

| PARAMETER | RESULT | UNITS | Q | D.L. | METHOD | ANALYST | DATE |
|--------------------------|--------|------------|---|------|-----------|---------|----------|
| Fecal Coliform | 370 | CFU/100 ml | | 10 | SM 9222D | JM | 11/20/17 |
| Total Nitrogen (NOX&TKN) | 1.02 | mg/l | | 0.1 | | | |
| Total Nitrogen (TKN) | 0.696 | mg/l | | 0.1 | SM4500N | JC | 12/05/17 |
| Nitrate + Nitrite | 0.32 | mg/l | | 0.01 | SM4500NO3 | JC | 11/30/17 |

AMTEST Identification Number 17-A020475
Client Identification EVAMS-20171119
Sampling Date 11/19/17, 18:35

Results

| PARAMETER | RESULT | UNITS | Q | D.L. | METHOD | ANALYST | DATE |
|--------------------------|--------|------------|---|------|-----------|---------|----------|
| Fecal Coliform | 30. | CFU/100 ml | | 10 | SM 9222D | JM | 11/20/17 |
| Total Nitrogen (NOX&TKN) | 2.46 | mg/l | | 0.1 | | | |
| Total Nitrogen (TKN) | 0.559 | mg/l | | 0.1 | SM4500N | JC | 12/05/17 |
| Nitrate + Nitrite | 1.9 | mg/l | | 0.01 | SM4500NO3 | JC | 11/30/17 |

AMTEST Identification Number 17-A020476
Client Identification EVALSS-20171119
Sampling Date 11/19/17, 18:55

Results

| PARAMETER | RESULT | UNITS | Q | D.L. | METHOD | ANALYST | DATE |
|--------------------------|--------|------------|---|------|-----------|---------|----------|
| Fecal Coliform | 10. | CFU/100 ml | | 10 | SM 9222D | JM | 11/20/17 |
| Total Nitrogen (NOX&TKN) | 2.22 | mg/l | | 0.1 | | | |
| Total Nitrogen (TKN) | 0.719 | mg/l | | 0.1 | SM4500N | JC | 12/05/17 |
| Nitrate + Nitrite | 1.5 | mg/l | | 0.01 | SM4500NO3 | JC | 11/30/17 |

AMTEST Identification Number 17-A020477
Client Identification MONMN-20171119
Sampling Date 11/19/17, 20:20

Results

| PARAMETER | RESULT | UNITS | Q | D.L. | METHOD | ANALYST | DATE |
|--------------------------|--------|------------|---|------|-----------|---------|----------|
| Fecal Coliform | 10. | CFU/100 ml | | 10 | SM 9222D | JM | 11/20/17 |
| Total Nitrogen (NOX&TKN) | 0.79 | mg/l | | 0.1 | | | |
| Total Nitrogen (TKN) | 0.546 | mg/l | | 0.1 | SM4500N | JC | 12/05/17 |
| Nitrate + Nitrite | 0.24 | mg/l | | 0.01 | SM4500NO3 | JC | 11/30/17 |

AMTEST Identification Number 17-A020478
Client Identification MONMS-20171119
Sampling Date 11/19/17, 20:45

Results

| PARAMETER | RESULT | UNITS | Q | D.L. | METHOD | ANALYST | DATE |
|--------------------------|--------|------------|---|------|-----------|---------|----------|
| Fecal Coliform | 30. | CFU/100 ml | | 10 | SM 9222D | JM | 11/20/17 |
| Total Nitrogen (NOX&TKN) | 0.84 | mg/l | | 0.1 | | | |
| Total Nitrogen (TKN) | 0.567 | mg/l | | 0.1 | SM4500N | JC | 12/05/17 |
| Nitrate + Nitrite | 0.27 | mg/l | | 0.01 | SM4500NO3 | JC | 11/30/17 |

AMTEST Identification Number 17-A020479
Client Identification MONM-20171119
Sampling Date 11/19/17, 21:30

Results

| PARAMETER | RESULT | UNITS | Q | D.L. | METHOD | ANALYST | DATE |
|--------------------------|--------|------------|---|------|-----------|---------|----------|
| Fecal Coliform | 140 | CFU/100 ml | | 10 | SM 9222D | JM | 11/20/17 |
| Total Nitrogen (NOX&TKN) | 0.94 | mg/l | | 0.1 | | | |
| Total Nitrogen (TKN) | 0.665 | mg/l | | 0.1 | SM4500N | JC | 12/05/17 |
| Nitrate + Nitrite | 0.28 | mg/l | | 0.01 | SM4500NO3 | JC | 11/30/17 |

AMTEST Identification Number 17-A020480
Client Identification SEIMN-20171119
Sampling Date 11/19/17, 20:25

Results

| PARAMETER | RESULT | UNITS | Q | D.L. | METHOD | ANALYST | DATE |
|--------------------------|--------|------------|---|------|-----------|---------|----------|
| Fecal Coliform | < 10 | CFU/100 ml | | 10 | SM 9222D | JM | 11/20/17 |
| Total Nitrogen (NOX&TKN) | 0.72 | mg/l | | 0.1 | | | |
| Total Nitrogen (TKN) | 0.570 | mg/l | | 0.1 | SM4500N | JC | 12/05/17 |
| Nitrate + Nitrite | 0.15 | mg/l | | 0.01 | SM4500NO3 | JC | 11/30/17 |

AMTEST Identification Number 17-A020481
Client Identification SEIMS-20171119
Sampling Date 11/19/17, 19:40

Results

| PARAMETER | RESULT | UNITS | Q | D.L. | METHOD | ANALYST | DATE |
|--------------------------|--------|------------|---|------|-----------|---------|----------|
| Fecal Coliform | < 10 | CFU/100 ml | | 10 | SM 9222D | JM | 11/20/17 |
| Total Nitrogen (NOX&TKN) | 0.74 | mg/l | | 0.1 | | | |
| Total Nitrogen (TKN) | 0.544 | mg/l | | 0.1 | SM4500N | JC | 12/05/17 |
| Nitrate + Nitrite | 0.20 | mg/l | | 0.01 | SM4500NO3 | JC | 11/30/17 |

AMTEST Identification Number 17-A020482
Client Identification TOSMI-20171119
Sampling Date 11/19/17, 17:55

Results

| PARAMETER | RESULT | UNITS | Q | D.L. | METHOD | ANALYST | DATE |
|--------------------------|--------|------------|---|------|-----------|---------|----------|
| Fecal Coliform | 100 | CFU/100 ml | | 10 | SM 9222D | JM | 11/20/17 |
| Total Nitrogen (NOX&TKN) | 1.70 | mg/l | | 0.1 | | | |
| Total Nitrogen (TKN) | 0.828 | mg/l | | 0.1 | SM4500N | JC | 12/05/17 |
| Nitrate + Nitrite | 0.87 | mg/l | | 0.01 | SM4500NO3 | JC | 11/30/17 |

AMTEST Identification Number 17-A020483
Client Identification TOSMO-20171119
Sampling Date 11/19/17, 18:35

Results

| PARAMETER | RESULT | UNITS | Q | D.L. | METHOD | ANALYST | DATE |
|--------------------------|--------|------------|---|------|-----------|---------|----------|
| Fecal Coliform | 130 | CFU/100 ml | | 10 | SM 9222D | JM | 11/20/17 |
| Total Nitrogen (NOX&TKN) | 1.51 | mg/l | | 0.1 | | | |
| Total Nitrogen (TKN) | 0.578 | mg/l | | 0.1 | SM4500N | JC | 12/05/17 |
| Nitrate + Nitrite | 0.93 | mg/l | | 0.01 | SM4500NO3 | JC | 11/30/17 |

AMTEST Identification Number 17-A020484
Client Identification TYLMI-20171119
Sampling Date 11/19/17, 20:00

Results

| PARAMETER | RESULT | UNITS | Q | D.L. | METHOD | ANALYST | DATE |
|--------------------------|--------|------------|---|------|-----------|---------|----------|
| Fecal Coliform | 60. | CFU/100 ml | | 10 | SM 9222D | JM | 11/20/17 |
| Total Nitrogen (NOX&TKN) | 1.37 | mg/l | | 0.1 | | | |
| Total Nitrogen (TKN) | 0.894 | mg/l | | 0.1 | SM4500N | JC | 12/05/17 |
| Nitrate + Nitrite | 0.48 | mg/l | | 0.01 | SM4500NO3 | JC | 11/30/17 |

AMTEST Identification Number 17-A020485
Client Identification TYLMO-20171119
Sampling Date 11/19/17, 19:25


Results

| PARAMETER | RESULT | UNITS | Q | D.L. | METHOD | ANALYST | DATE |
|--------------------------|--------|------------|---|------|-----------|---------|----------|
| Fecal Coliform | 90. | CFU/100 ml | | 10 | SM 9222D | JM | 11/20/17 |
| Total Nitrogen (NOX&TKN) | 0.72 | mg/l | | 0.1 | | | |
| Total Nitrogen (TKN) | 0.510 | mg/l | | 0.1 | SM4500N | JC | 12/05/17 |
| Nitrate + Nitrite | 0.21 | mg/l | | 0.01 | SM4500NO3 | JC | 11/30/17 |

AMTEST Identification Number 17-A020486
Client Identification QA-36--20171119
Sampling Date 11/19/17, 19:40

Results

| PARAMETER | RESULT | UNITS | Q | D.L. | METHOD | ANALYST | DATE |
|--------------------------|--------|------------|---|------|-----------|---------|----------|
| Fecal Coliform | 60. | CFU/100 ml | | 10 | SM 9222D | JM | 11/20/17 |
| Total Nitrogen (NOX&TKN) | 1.45 | mg/l | | 0.1 | | | |
| Total Nitrogen (TKN) | 1.10 | mg/l | | 0.1 | SM4500N | JC | 12/05/17 |
| Nitrate + Nitrite | 0.35 | mg/l | | 0.01 | SM4500NO3 | JC | 11/30/17 |


Aaron W. Young
Laboratory Manager

QC Summary for sample numbers: 17-A020472 to 17-A020486

DUPLICATES

| SAMPLE # | ANALYTE | UNITS | SAMPLE VALUE | DUP VALUE | RPD |
|------------|----------------------|------------|--------------|-----------|------|
| 17-A020475 | Fecal Coliform | CFU/100 ml | 30. | 20. | 40. |
| 17-A020486 | Fecal Coliform | CFU/100 ml | 60. | 70. | 15. |
| 17-A020472 | Total Nitrogen (TKN) | mg/l | 0.842 | 0.796 | 5.6 |
| 17-A020482 | Total Nitrogen (TKN) | mg/l | 0.828 | 0.832 | 0.48 |
| 17-A021013 | Total Nitrogen (TKN) | mg/l | 0.749 | 0.894 | 18. |
| 17-A020481 | Nitrate + Nitrite | mg/l | 0.20 | 0.23 | 14. |
| 17-A020510 | Nitrate + Nitrite | mg/l | 0.37 | 0.35 | 5.6 |
| 17-A020520 | Nitrate + Nitrite | mg/l | 0.92 | 0.86 | 6.7 |
| 17-A020669 | Nitrate + Nitrite | mg/l | 0.21 | 0.22 | 4.7 |
| 17-A020746 | Nitrate + Nitrite | mg/l | 0.20 | 0.18 | 11. |

MATRIX SPIKES

| SAMPLE # | ANALYTE | UNITS | SAMPLE VALUE | SMPL+ SPK | SPK AMT | RECOVERY |
|------------|----------------------|-------|--------------|-----------|---------|----------|
| 17-A020472 | Total Nitrogen (TKN) | mg/l | 0.842 | 2.79 | 2.00 | 97.40 % |
| 17-A020482 | Total Nitrogen (TKN) | mg/l | 0.828 | 2.70 | 2.00 | 93.60 % |
| 17-A021013 | Total Nitrogen (TKN) | mg/l | 0.749 | 2.78 | 2.00 | 101.55 % |
| 17-A020481 | Nitrate + Nitrite | mg/l | 0.20 | 1.2 | 1.0 | 100.00 % |
| 17-A020510 | Nitrate + Nitrite | mg/l | 0.37 | 1.4 | 1.0 | 103.00 % |
| 17-A020520 | Nitrate + Nitrite | mg/l | 0.92 | 2.1 | 1.0 | 118.00 % |
| 17-A020669 | Nitrate + Nitrite | mg/l | 0.21 | 1.1 | 1.0 | 89.00 % |
| 17-A020746 | Nitrate + Nitrite | mg/l | 0.20 | 1.1 | 1.0 | 90.00 % |

STANDARD REFERENCE MATERIALS

| ANALYTE | UNITS | TRUE VALUE | MEASURED VALUE | RECOVERY |
|----------------------|-------|------------|----------------|----------|
| Total Nitrogen (TKN) | mg/l | 1.00 | 0.928 | 92.8 % |
| Total Nitrogen (TKN) | mg/l | 1.00 | 0.962 | 96.2 % |
| Nitrate + Nitrite | mg/l | 1.0 | 1.0 | 100. % |
| Nitrate + Nitrite | mg/l | 1.0 | 0.96 | 96.0 % |

BLANKS

| ANALYTE | UNITS | RESULT |
|----------------------|------------|--------|
| Fecal Coliform | CFU/100 ml | < 1 |
| Fecal Coliform | CFU/100 ml | < 1 |
| Total Nitrogen (TKN) | mg/l | < 0.1 |
| Total Nitrogen (TKN) | mg/l | < 0.1 |
| Nitrate + Nitrite | mg/l | < 0.01 |
| Nitrate + Nitrite | mg/l | < 0.01 |



14648 NE 95th Street, Redmond, WA 98052 · (425) 883-3881

Laboratory: AmTest Laboratories

Attention: Aaron Young

13600 NE 126th PI Kirkland, WA 98034

Phone Number: (425) 885-1664

Turnaround Request

1 Day 2 Day 3 Day

Standard

Other: _____

Laboratory Reference #: 11-240

Project Manager: Blair Goodrow

email: bgoodrow@onsite-env.com

Project Number: 14-05806-000

Project Name: Redmond Paired Watershed Study

| Lab ID | Sample Identification | Date Sampled | Time Sampled | Matrix | # of Cont. | Requested Analyses |
|------------------|-----------------------|--------------|--------------|----------|------------|--|
| 1 | COLM-20171119 20472 | 11/19/17 | 2105 | Water | 2 | Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N |
| 2 | COUMI-20171119 73 | 11/19/17 | 1805 | Water | 2 | Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N |
| 3 | COUMO-20171119 74 | 11/19/17 | 1750 | Water | 2 | Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N |
| 4 | EVAMS-20171119 75 | 11/19/17 | 1835 | Water | 2 | Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N |
| 5 | EVALSS-20171119 76 | 11/19/17 | 1855 | Water | 2 | Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N |
| 6 | MONMN-20171119 77 | 11/19/17 | 2020 | Water | 2 | Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N |
| 7 | MONMS-20171119 78 | 11/19/17 | 2045 | Water | 2 | Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N |
| 8 | MONM-20171119 79 | 11/19/17 | 2130 | Water | 2 | Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N |
| 9 | SEIMN-20171119 80 | 11/19/17 | 2025 | Water | 2 | Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N |
| 10 | SEIMS-20171119 81 | 11/19/17 | 1940 | Water | 2 | Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N |
| Signature | | Company | | Date | Time | Comments/Special Instructions |
| Relinquished by: | | OSE | | 11/20/17 | 1230 | EDDs - CSV Reporting Limits: Fecal Coliform - 1.0 cfu/100ml Total Nitrogen - .10 mg/L |
| Received by: | | T=6.0 | | 11/20/17 | 1250 | |
| Relinquished by: | | | | | | |
| Received by: | | | | | | |
| Relinquished by: | | | | | | |
| Received by: | | | | | | |



14648 NE 95th Street, Redmond, WA 98052 · (425) 883-3881

Laboratory: AmTest Laboratories

Attention: Aaron Young

13600 NE 126th PI Kirkland, WA 98034

Phone Number: (425) 885-1664

Turnaround Request

1 Day 2 Day 3 Day

Standard

Other: _____

Laboratory Reference #: 11-240

Project Manager: Blair Goodrow

email: bgoodrow@onsite-env.com

Project Number: 14-05806-000

Project Name: Redmond Paired Watershed Study

| Lab ID | Sample Identification | Date Sampled | Time Sampled | Matrix | # of Cont. | Requested Analyses |
|-------------------------------------|-----------------------------|----------------|--------------|-----------------|-------------|---|
| 11 | TOSMI-20171119 <i>20482</i> | 11/19/17 | 1755 | Water | 2 | Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N |
| 12 | TOSMO-20171119 <i>83</i> | 11/19/17 | 1835 | Water | 2 | Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N |
| 13 | TYLMI-20171119 <i>84</i> | 11/19/17 | 2000 | Water | 2 | Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N |
| 14 | TYLMO-20171119 <i>85</i> | 11/19/17 | 1925 | Water | 2 | Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N |
| 15 | QA-36-20171119 <i>86</i> | 11/19/17 | 1940 | Water | 2 | Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| Signature | | Company | | Date | Time | Comments/Special Instructions |
| Relinquished by: <i>[Signature]</i> | | <i>OSE</i> | | <i>11/20/17</i> | <i>1230</i> | |
| Received by: <i>[Signature]</i> | | <i>T = 6.0</i> | | <i>11/20/17</i> | <i>1230</i> | |
| Relinquished by: | | | | | | |
| Received by: | | | | | | |
| Relinquished by: | | | | | | |
| Received by: | | | | | | |

EDDs - CSV

Reporting Limits:

Fecal Coliform - 1.0 cfu/100ml

Total Nitrogen - .10 mg/L



14648 NE 95th Street, Redmond, WA 98052
Telephone: 425.883.3881

Company: Herrera Environmental Consultants

Project No.: 14-05806-000

Project Name: Redmond Paired Watershed Study

Project Manager: George Iftner

CHAIN OF CUSTODY

Turnaround Requested:

- 1 Day
- 2 Day
- 3 Day
- Standard

Laboratory No.

11-240

Requested Analyses

| Total Suspended Solids (SM 2540D) | Turbidity (EPA 181.1) | Hardness (EPA 200.7 / SM 2340B) | Dissolved Organ Carbon (SM 5310B) * | Fecal Coliform (SM 9222D) | Total Phosphorus (EPA 365.1) | Total Nitrogen (SM 4500 N-B) | Total Cu and Zn (EPA 200.8) | Dissolved Cu and Zn (EPA 200.8) * | | | | | | | |
|-----------------------------------|-----------------------|---------------------------------|-------------------------------------|---------------------------|------------------------------|------------------------------|-----------------------------|-----------------------------------|--|--|--|--|--|--|--|
|-----------------------------------|-----------------------|---------------------------------|-------------------------------------|---------------------------|------------------------------|------------------------------|-----------------------------|-----------------------------------|--|--|--|--|--|--|--|

| Lab ID | Sample Identification | Date Sampled | Time Sampled | Matrix | # of Cont. | Total Suspended Solids (SM 2540D) | Turbidity (EPA 181.1) | Hardness (EPA 200.7 / SM 2340B) | Dissolved Organ Carbon (SM 5310B) * | Fecal Coliform (SM 9222D) | Total Phosphorus (EPA 365.1) | Total Nitrogen (SM 4500 N-B) | Total Cu and Zn (EPA 200.8) | Dissolved Cu and Zn (EPA 200.8) * | | | | | | |
|--------|-----------------------|--------------|--------------|--------|------------|-----------------------------------|-----------------------|---------------------------------|-------------------------------------|---------------------------|------------------------------|------------------------------|-----------------------------|-----------------------------------|--|--|--|--|--|--|
| 1 | COLM-2017 1119 | 11-19-17 | 2105 | Water | 7 | X | X | X | X | X | X | X | X | X | | | | | | |
| 2 | COUMI-2017 1119 | | 1805 | Water | 7 | X | X | X | X | X | X | X | X | X | | | | | | |
| 3 | COUMO-2017 1119 | | 1750 | Water | 7 | X | X | X | X | X | X | X | X | X | | | | | | |
| 4 | EVAMS-2017 1119 | | 1835 | Water | 7 | X | X | X | X | X | X | X | X | X | | | | | | |
| 5 | EVALSS-2017 1119 | | 1855 | Water | 7 | X | X | X | X | X | X | X | X | X | | | | | | |
| 6 | MONMN-2017 1119 | | 2020 | Water | 7 | X | X | X | X | X | X | X | X | X | | | | | | |
| 7 | MONMS-2017 1119 | | 2045 | Water | 7 | X | X | X | X | X | X | X | X | X | | | | | | |
| 8 | MONM-2017 1119 | | 2130 | Water | 7 | X | X | X | X | X | X | X | X | X | | | | | | |
| 9 | SEIMN-2017 1119 | | 2025 | Water | 7 | X | X | X | X | X | X | X | X | X | | | | | | |
| 10 | SEIMS-2017 1119 | | 1940 | Water | 7 | X | X | X | X | X | X | X | X | X | | | | | | |
| 11 | TOSMI-2017 1119 | | 1755 | Water | 7 | X | X | X | X | X | X | X | X | X | | | | | | |
| 12 | TOSMO-2017 1119 | | 1835 | Water | 7 | X | X | X | X | X | X | X | X | X | | | | | | |
| 13 | TYLMI-2017 1119 | | 2000 | Water | 7 | X | X | X | X | X | X | X | X | X | | | | | | |
| 14 | TYLMO-2017 1119 | | 1925 | Water | 7 | X | X | X | X | X | X | X | X | X | | | | | | |
| 15 | QA 36-2017 1119 | | 1940 | Water | 7 | X | X | X | X | X | X | X | X | X | | | | | | |

Relinquished by Miriam Iftner Date 11-20-17 Received by [Signature] Date 11/20/17
 Firm Herrera Time 9:00 Firm OSE Time 9:00 AM

Relinquished by _____ Date _____ Received by _____ Date _____
 Firm _____ Time _____ Firm _____ Time _____

Comments:
 * - field filtered with 0.45 µm filter within 15 minutes of collecting sample



14648 NE 95th Street, Redmond, WA 98052
Telephone: 425.883.3881

Company: Herrera Environmental Consultants
Project No.: 14-05806-000
Project Name: Redmond Paired Watershed Study
Project Manager: George Illner

CHAIN OF CUSTODY

Turnaround Requested:

1 Day

2 Day

3 Day

Standard

Laboratory No. **11-240**

Requested Analyses

| Total Suspended Solids (SM 2540D) | Turbidity (EPA 181.1) | Hardness (EPA 200.7 / SM 2340B) | Dissolved Organ Carbon (SM 5310B) * | Fecal Coliform (SM 9222D) | Total Phosphorus (EPA 365.1) | Total Nitrogen (SM 4500 N-B) | Total Cu and Zn (EPA 200.8) | Dissolved Cu and Zn (EPA 200.8) * |
|-----------------------------------|-----------------------|---------------------------------|-------------------------------------|---------------------------|------------------------------|------------------------------|-----------------------------|-----------------------------------|
|-----------------------------------|-----------------------|---------------------------------|-------------------------------------|---------------------------|------------------------------|------------------------------|-----------------------------|-----------------------------------|

| Lab ID | Sample Identification | Date Sampled | Time Sampled | Matrix | # of Cont. | Total Suspended Solids (SM 2540D) | Turbidity (EPA 181.1) | Hardness (EPA 200.7 / SM 2340B) | Dissolved Organ Carbon (SM 5310B) * | Fecal Coliform (SM 9222D) | Total Phosphorus (EPA 365.1) | Total Nitrogen (SM 4500 N-B) | Total Cu and Zn (EPA 200.8) | Dissolved Cu and Zn (EPA 200.8) * |
|--------|-----------------------|--------------|--------------|--------|------------|-----------------------------------|-----------------------|---------------------------------|-------------------------------------|---------------------------|------------------------------|------------------------------|-----------------------------|-----------------------------------|
| 1 | COLM-2017 1119 | 11-19-17 | 2105 | Water | 7 | X | X | X | X | X | X | X | X | X |
| 2 | COUMI-2017 1119 | | 1805 | Water | 7 | X | X | X | X | X | X | X | X | X |
| 3 | COUMO-2017 1119 | | 1750 | Water | 7 | X | X | X | X | X | X | X | X | X |
| 4 | EVAMS-2017 1119 | | 1835 | Water | 7 | X | X | X | X | X | X | X | X | X |
| 5 | EVALSS-2017 1119 | | 1855 | Water | 7 | X | X | X | X | X | X | X | X | X |
| 6 | MONMN-2017 1119 | | 2020 | Water | 7 | X | X | X | X | X | X | X | X | X |
| 7 | MONMS-2017 1119 | | 2045 | Water | 7 | X | X | X | X | X | X | X | X | X |
| 8 | MONM-2017 1119 | | 2130 | Water | 7 | X | X | X | X | X | X | X | X | X |
| 9 | SEIMN-2017 1119 | | 2025 | Water | 7 | X | X | X | X | X | X | X | X | X |
| 10 | SEIMS-2017 1119 | | 1940 | Water | 7 | X | X | X | X | X | X | X | X | X |
| 11 | TOSMI-2017 1119 | | 1755 | Water | 7 | X | X | X | X | X | X | X | X | X |
| 12 | TOSMO-2017 1119 | | 1835 | Water | 7 | X | X | X | X | X | X | X | X | X |
| 13 | TYLMI-2017 1119 | | 2000 | Water | 7 | X | X | X | X | X | X | X | X | X |
| 14 | TYLMO-2017 1119 | | 1925 | Water | 7 | X | X | X | X | X | X | X | X | X |
| 15 | QA 34-2017 1119 | | 1940 | Water | 7 | X | X | X | X | X | X | X | X | X |

Relinquished by Miriam Illner Date 11-20-17 Received by [Signature] Date 11/20/17

Firm Herrera Time 9:00 Firm OSE Time 9:00 AM

Relinquished by _____ Date _____ Received by _____ Date _____

Firm _____ Time _____ Firm _____ Time _____

Comments:
* - field filtered with 0.45 µm filter within 15 minutes of collecting sample

METER CALIBRATION LOG - Redmond Paired Watershed Study

| | | | |
|-----------------------------------|----------------|---------------------|--|
| Project Number: | 14-05806-000 | | |
| Personnel Performing Calibration: | B. Bland | | |
| Meter: | YSI PRO DSS #1 | | |
| Date/Time: | 11-19-17 16:35 | | |
| Barometric Pressure Start of Day: | mmHg: 756.9 | Time: 16:37 | |
| Barometric Pressure End of Day: | mmHg: 751.8 | Time: 11:30 (11/20) | |

| |
|---|
| Calibration Procedures: |
| Rinse Multimeter Sonde Between Each Operation |
| Rinse 3 times with tap water, 3 times with deionized water, then 3 times with the solution to be used for calibrating or testing. |
| Conductivity Calibration Notes: |



| PRE Field Run CALIBRATION | Meter Reading | Buffer / Cal Std | Temp °C | Comments |
|---------------------------|---------------|------------------|---------|----------|
| Conductivity (µS/cm) | 10.2 | 0 | 21.8 | |
| Conductivity (µS/cm) | 1001 | 1,000 | 21.6 | |
| Conductivity (µS/cm) | 1009 | 100 | 21.6 | |
| DO % Saturation | 99.5 | 100 | 21.1 | |

| POST Field Run CHECK | Meter Reading | Buffer / Cal Std | Temp °C | Comments |
|----------------------|---------------|------------------|---------|----------|
| Conductivity (µS/cm) | 10.3 | 0 | 22.7 | |
| Conductivity (µS/cm) | 101.2 | 100 | 22.3 | |
| DO % Saturation | 99.0 | 100 | 22.1 | |

1. Dry the conductivity probe with a lab tissue (e.g., KimWipes®) and DI water.
2. Fill calibration cup to within a centimeter of the top of the calibration cup with DI water (0 µS).
3. Fill the calibration cup with 1,000 µS standard so that the temperature/conductivity probe is submerged.
4. Make sure there are no bubbles in the cell; wait 2 minutes.
5. Enter the appropriate standard value (1,000 µS/cm or 1.0 mS/cm) for Sp Cond.
6. Check conductivity using 100 µS/cm standard.

- Dissolved Oxygen Calibration Notes:**
1. Fill the calibration cup with about 1/2 inch of DI; it should be below the sensor cap.
 2. Use KimWipes® to dry any droplets from the sensor cap.
 3. Invert calibration cup's cap and gently rest it on the cup.
 4. Wait 5 minutes, making sure that temperature stabilizes.
 5. Determine local barometric pressure (mm Hg) and enter this value into the meter.
 6. Click "Calibrate". "Calibrate Successful" will be displayed.
 7. To retain calibration accuracy between measurements, store with the sensor immersed in water or within a water-saturated air environment such as a sealed storage cup with at least 10 ml of water.
 8. It is important to have the water-saturated air and the sensor at the same temperature. Therefore, store a jar of DI in the same environment as the sonde and calibrate in a similar air temperature as the water and sonde.
 9. Keep probe out of direct sun or wind.

METER CALIBRATION LOG - Redmond Paired Watershed Study

| | | | |
|-----------------------------------|----------------|-------|---------------|
| Project Number: | 14-05806-000 | | |
| Personnel Performing Calibration: | B. Bland | | |
| Meter: | YSI PM DSS #2 | | |
| Date/Time: | 11-19-17 16:38 | | |
| Barometric Pressure Start of Day: | mmHg: 751.1 | Time: | 16:31 |
| Barometric Pressure End of Day: | mmHg: 754.4 | Time: | 11:30 (11/20) |

| |
|---|
| Calibration Procedures: |
| Rinse Multimeter Sonde Between Each Operation |
| Rinse 3 times with tap water, 3 times with deionized water, then 3 times with the solution to be used for calibrating or testing. |
| Conductivity Calibration Notes: |



| PRE Field Run CALIBRATION | Meter Reading | Buffer / Cal Std | Temp °C | Comments |
|---------------------------|---------------|------------------|---------|-------------------------------|
| Conductivity (µS/cm) | 6.1 | 0 | 22.0 | |
| Conductivity (µS/cm) | 1002 | 1,000 | 22.0 | |
| Conductivity (µS/cm) | 101.3 | 100 | 21.9 | |
| DO % Saturation | 98.0 | 100 | 21.1 | would only let me cal to 98.9 |

1. Dry the conductivity probe with a lab tissue (e.g., KimWipes®) and DI water.
2. Fill calibration cup to within a centimeter of the top of the calibration cup with DI water (0 µS).
3. Fill the calibration cup with 1,000 µS standard so that the temperature/conductivity probe is submerged.
4. Make sure there are no bubbles in the cell; wait 2 minutes.
5. Enter the appropriate standard value (1,000 µS/cm or 1.0 mS/cm) for Sp Cond.
6. Check conductivity using 100 µS/cm standard.

| POST Field Run CHECK | Meter Reading | Buffer / Cal Std | Temp °C | Comments |
|----------------------|---------------|------------------|---------|----------|
| Conductivity (µS/cm) | 14.0 | 0 | 22.9 | |
| Conductivity (µS/cm) | 101.5 | 100 | 22.5 | |
| DO % Saturation | 99.6 | 100 | 22.0 | |

- Dissolved Oxygen Calibration Notes:**
1. Fill the calibration cup with about 1/2 inch of DI; it should be below the sensor cap.
 2. Use KimWipes® to dry any droplets from the sensor cap.
 3. Invert calibration cup's cap and gently rest it on the cup.
 4. Wait 5 minutes, making sure that temperature stabilizes.
 5. Determine local barometric pressure (mm Hg) and enter this value into the meter.
 6. Click "Calibrate". "Calibrate Successful" will be displayed.
 7. To retain calibration accuracy between measurements, store with the sensor immersed in water or within a water-saturated air environment such as a sealed storage cup with at least 10 ml of water.
 8. It is important to have the water-saturated air and the sensor at the same temperature. Therefore, store a jar of DI in the same environment as the sonde and calibrate in a similar air temperature as the water and sonde.
 9. Keep probe out of direct sun or wind.

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: AS/WV
 Sample Date: 11-19-17 Sample Time: 2:05 PDT:
 Base Flow or Storm Event? Field Filtered Time: 2:10 PST: X
 (Must filter within 15 minutes of collection)

SITE ID: COLM
 Project Number: 14-05806-000



Project Name: Redmond Paired Watershed Study

Current Weather and Temp: LIGHT RAIN, 40°F

Water Quality Sampling

Sample ID: COLM20171119

| Parameter | Bottle Type | Bottle Volume | # Bottles | Preservative | Duplicated? |
|---------------------------|-------------|---------------|-----------|--------------------------------|-------------|
| TSS and Turbidity | HDPE | 1L | 1 | NA | N |
| DOC * | HDPE | 250 ml | 1 | HCL | ↓ |
| Fecal Col. Bact. | HDPE | 250 ml | 1 | EDTA | ↓ |
| T. Phosphorous | HDPE | 250 ml | 1 | H ₂ SO ₄ | ↓ |
| T. Nitrogen | HDPE | 250 ml | 1 | H ₂ SO ₄ | ↓ |
| Diss. Cu and Zn * | HDPE | 250 ml | 1 | HNO ₃ | ↓ |
| Hardness, Total Cu and Zn | HDPE | 500 ml | 1 | HNO ₃ | ↓ |

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID:
 Filter blank sample ID:
 Transfer blank sample ID:

Visual and Olfactory Conditions:

Clarity: CLEAR
 Color: TANNIN (YELLOWISH) COLOR
 Odor: NONE
 Sheen: NONE
 Floatables: LEAVES

LABORATORY DELIVERY

Date: Time:

Quality Assurance

Checked By: Scott Leuter Signature: [Signature]
 Date Checked: 12-4-17 Time:
 Data Entered into Database? YES NO initials:
 Date Entered: Time:
 Notes:

Field Meter Calibration

Check which field meter was used and complete the meter calibration form
 YSI Pro Plus (15D100020)
 YSI Pro DSS 1 X
 YSI Pro DSS 2

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)
 Stream Stage (ft): 5.64
 Reference Point (description): SG

Water Quality Measurements

Temperature (°C) 6.5
 Specific Conductivity (µs/cm) 413
 Dissolved Oxygen (mg/L) 10.40

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: BB
 Sample Date: 11-19-17 Sample Time: 1805 PDT:
 Base Flow or Storm Event? Field Filtered Time: 1810 PST
(Must filter within 15 minutes of collection)

SITE ID: COUM1
 Project Number: 14-05806-000



Project Name: Redmond Paired Watershed Study

Current Weather and Temp: Raining 43°F

Water Quality Sampling

Sample ID: COUM1-2017119

| Parameter | Bottle Type | Bottle Volume | # Bottles | Preservative | Duplicated? |
|---------------------------|-------------|---------------|-----------|--------------------------------|-------------|
| TSS and Turbidity | HDPE | 1L | 1 | NA | <u>N</u> |
| DOC * | HDPE | 250 ml | 1 | HCL | ↓ |
| Fecal Col. Bact. | HDPE | 250 ml | 1 | EDTA | |
| T. Phosphorous | HDPE | 250 ml | 1 | H ₂ SO ₄ | |
| T Nitrogen | HDPE | 250 ml | 1 | H ₂ SO ₄ | |
| Diss. Cu and Zn * | HDPE | 250 ml | 1 | HNO ₃ | |
| Hardness, Total Cu and Zn | HDPE | 500 ml | 1 | HNO ₃ | |

* - field filtered with Nalgene 250 ml SFCA 0.45 μm filter and vacuum hand pump

Duplicate sample ID: _____
 Filter blank sample ID: _____
 Transfer blank sample ID: _____

Visual and Olfactory Conditions:

Clarity: cloudy
 Color: light brown
 Odor: none
 Sheen: none
 Floatables: susp sed

LABORATORY DELIVERY

Date: _____ Time: _____

Quality Assurance

Checked By: John Lamb Signature: [Signature]
 Date Checked: 12-4-17 Time: _____
 Data Entered into Database? YES NO initials: _____
 Date Entered: _____ Time: _____
 Notes: _____

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

YSI Pro Plus (15D100020) _____
 YSI Pro DSS 1 _____
 YSI Pro DSS 2 _____

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): 2.71
 Reference Point (description): SG

Water Quality Measurements

Temperature (°C) 8.6
 Specific Conductivity (μs/cm) 215.2
 Dissolved Oxygen (mg/L) 10.96

slow filtering - took 4 filters & still didn't get 200ml/ea

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: BB
 Sample Date: 11-19-17 Sample Time: 1750 PDT:
 Base Flow or Storm Event? Storm Field Filtered Time: 1755 PST: X
 (Must filter within 15 minutes of collection)

SITE ID: COUMO
 Project Number: 14-05806-000



Project Name: Redmond Paired Watershed Study

Current Weather and Temp: Rainy 343°F

Water Quality Sampling

Sample ID: COUMO.20171119

| Parameter | Bottle Type | Bottle Volume | # Bottles | Preservative | Duplicated? |
|---------------------------|-------------|---------------|-----------|--------------------------------|-------------|
| TSS and Turbidity | HDPE | 1L | 1 | NA | N |
| DOC * | HDPE | 250 ml | 1 | HCL | |
| Fecal Col. Bact. | HDPE | 250 ml | 1 | EDTA | |
| T. Phosphorous | HDPE | 250 ml | 1 | H ₂ SO ₄ | |
| T. Nitrogen | HDPE | 250 ml | 1 | H ₂ SO ₄ | |
| Diss. Cu and Zn * | HDPE | 250 ml | 1 | HNO ₃ | |
| Hardness, Total Cu and Zn | HDPE | 500 ml | 1 | HNO ₃ | |

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID: _____
 Filter blank sample ID: _____
 Transfer blank sample ID: _____

Visual and Olfactory Conditions:

Clarity: clear
 Color: light gray
 Odor: none
 Sheen: none
 Floatables: susp sed, org debris

LABORATORY DELIVERY

Date: _____ Time: _____

Quality Assurance

Checked By: John Leuter Signature: [Signature]
 Date Checked: 12-4-17 Time: _____
 Data Entered into Database? YES NO initials:
 Date Entered: _____ Time: _____
 Notes: _____

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

YSI Pro Plus (15D100020) _____
 YSI Pro DSS 1 _____
 YSI Pro DSS 2 X

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): 1.38
 Reference Point (description): SG

Water Quality Measurements

Temperature (°C) 9.3
 Specific Conductivity (µs/cm) 187.0
 Dissolved Oxygen (mg/L) 10.82

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: AS / VW
 Sample Date: 11/19/17 Sample Time: 1835 PDT: _____
 Base Flow or Storm Event? (circled) Field Filtered Time: 1840 PST: X
(Must filter within 15 minutes of collection)

SITE ID: EVAMS
 Project Number: 14-05806-000



Project Name: Redmond Paired Watershed Study
 Current Weather and Temp: LIGHT RAIN, 40°F

Water Quality Sampling

Sample ID: EVAMS20171119

| Parameter | Bottle Type | Bottle Volume | # Bottles | Preservative | Duplicated? |
|---------------------------|-------------|---------------|-----------|--------------------------------|-------------|
| TSS and Turbidity | HDPE | 1L | 1 | NA | <u>N</u> |
| DOC * | HDPE | 250 ml | 1 | HCL | ↓ |
| Fecal Col. Bact. | HDPE | 250 ml | 1 | EDTA | |
| T. Phosphorous | HDPE | 250 ml | 1 | H ₂ SO ₄ | |
| T. Nitrogen | HDPE | 250 ml | 1 | H ₂ SO ₄ | |
| Diss. Cu and Zn * | HDPE | 250 ml | 1 | HNO ₃ | |
| Hardness, Total Cu and Zn | HDPE | 500 ml | 1 | HNO ₃ | ↓ |

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID: _____
 Filter blank sample ID: _____
 Transfer blank sample ID: _____

Visual and Olfactory Conditions:

Clarity: CLEAR
 Color: NONE
 Odor: NONE
 Sheen: NONE
 Floatables: NONE

LABORATORY DELIVERY

Date: _____ Time: _____

Quality Assurance

Checked By: John Lankford Signature: [Signature]
 Date Checked: 12-4-17 Time: _____
 Data Entered into Database? YES NO initials:
 Date Entered: _____ Time: _____
 Notes: _____

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

YSI Pro Plus (15D100020) _____
 YSI Pro DSS 1 X _____
 YSI Pro DSS 2 _____

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): 3.94
 Reference Point (description): S6

Water Quality Measurements

Temperature (°C) 7.9
 Specific Conductivity (µs/cm) 2058
 Dissolved Oxygen (mg/L) 11.13

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: AS/NW
 Sample Date: 11/19/17 Sample Time: 1855 PDT:
 Base Flow or Storm Event? (circled) Field Filtered Time: 1900 PST: X
 (Must filter within 15 minutes of collection)

SITE ID: EVALSS
 Project Number: 14-05806-000



Project Name: Redmond Paired Watershed Study
 Current Weather and Temp: STEADY RAIN, 40°F

Water Quality Sampling

Sample ID: EVALSS20171119

| Parameter | Bottle Type | Bottle Volume | # Bottles | Preservative | Duplicated? |
|---------------------------|-------------|---------------|-----------|--------------------------------|-------------|
| TSS and Turbidity | HDPE | 1L | 1 | NA | <u>N</u> |
| DOC * | HDPE | 250 ml | 1 | HCL | ↓ |
| Fecal Col. Bact. | HDPE | 250 ml | 1 | EDTA | |
| T. Phosphorous | HDPE | 250 ml | 1 | H ₂ SO ₄ | |
| T. Nitrogen | HDPE | 250 ml | 1 | H ₂ SO ₄ | |
| Diss. Cu and Zn * | HDPE | 250 ml | 1 | HNO ₃ | |
| Hardness, Total Cu and Zn | HDPE | 500 ml | 1 | HNO ₃ | |

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID: _____
 Filter blank sample ID: _____
 Transfer blank sample ID: _____

Visual and Olfactory Conditions:

Clarity: clear
 Color: none
 Odor: _____
 Sheen: ↓
 Floatables: _____

LABORATORY DELIVERY

Date: _____ Time: _____

Quality Assurance

Checked By: [Signature] Signature: [Signature]
 Date Checked: 12-4-17 Time: _____
 Data Entered into Database? YES NO initials:
 Date Entered: _____ Time: _____
 Notes: _____

Field Meter Calibration

Check which field meter was used and complete the meter calibration form
 YSI Pro Plus (15D100020) _____
 YSI Pro DSS 1 X _____
 YSI Pro DSS 2 _____

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)
 Stream Stage (ft): 7.31
 Reference Point (description): SG

Water Quality Measurements

Temperature (°C) 7.9
 Specific Conductivity (µs/cm) 192.8
 Dissolved Oxygen (mg/L) 11.61

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: BB
 Sample Date: 11.19.17 Sample Time: 2020 PDT:
 Base Flow or Storm Event? Storm Field Filtered Time: 2025 PST: X
(Must filter within 15 minutes of collection)

SITE ID: MONMN
 Project Number: 14-05806-000



Project Name: Redmond Paired Watershed Study

Current Weather and Temp: light rain, 41°F

Water Quality Sampling

Sample ID: MONMN-20171119

| Parameter | Bottle Type | Bottle Volume | # Bottles | Preservative | Duplicated? |
|---------------------------|-------------|---------------|-----------|--------------------------------|----------------------------|
| TSS and Turbidity | HDPE | 1L | 1 | NA | N ↓ ↓ ↓ ↓ ↓ |
| DOC * | HDPE | 250 ml | 1 | HCL | |
| Fecal Col. Bact. | HDPE | 250 ml | 1 | EDTA | |
| T. Phosphorous | HDPE | 250 ml | 1 | H ₂ SO ₄ | |
| T. Nitrogen | HDPE | 250 ml | 1 | H ₂ SO ₄ | |
| Diss. Cu and Zn * | HDPE | 250 ml | 1 | HNO ₃ | |
| Hardness, Total Cu and Zn | HDPE | 500 ml | 1 | HNO ₃ | |

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID: _____
 Filter blank sample ID: _____
 Transfer blank sample ID: _____

Visual and Olfactory Conditions:

Clarity: clear
 Color: none
 Odor: _____
 Sheen: _____
 Floatables: long debris

LABORATORY DELIVERY

Date: _____ Time: _____

Quality Assurance

Checked By: John Lenth Signature: [Signature]
 Date Checked: 12-1-17 Time: _____
 Data Entered into Database? YES NO initials:
 Date Entered: _____ Time: _____
 Notes: _____

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

YSI Pro Plus (15D100020) _____
 YSI Pro DSS 1 _____
 YSI Pro DSS 2 X _____

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): 9.17
 Reference Point (description): SG

Water Quality Measurements

Temperature (°C) 8.4
 Specific Conductivity (µs/cm) 231.5
 Dissolved Oxygen (mg/L) 10.02

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: B/B
Sample Date: 11-19-17 Sample Time: 2045 PDT
Base Flow or Storm Event? Storm Event? Field Filtered Time: 2050 PST X
(Must filter within 15 minutes of collection)

SITE ID: MONMS
Project Number: 14-05806-000



Project Name: Redmond Paired Watershed Study

Current Weather and Temp: light rain 41 F

Water Quality Sampling

Sample ID: MONMS-20171119

| Parameter | Bottle Type | Bottle Volume | # Bottles | Preservative | Duplicated? |
|---------------------------|-------------|---------------|-----------|--------------------------------|-------------------------------------|
| TSS and Turbidity | HDPE | 1L | 1 | NA | <input checked="" type="checkbox"/> |
| DOC * | HDPE | 250 ml | 1 | HCL | <input checked="" type="checkbox"/> |
| Fecal Col. Bact | HDPE | 250 ml | 1 | EDTA | <input checked="" type="checkbox"/> |
| T. Phosphorous | HDPE | 250 ml | 1 | H ₂ SO ₄ | <input checked="" type="checkbox"/> |
| T Nitrogen | HDPE | 250 ml | 1 | H ₂ SO ₄ | <input checked="" type="checkbox"/> |
| Diss. Cu and Zn * | HDPE | 250 ml | 1 | HNO ₃ | <input checked="" type="checkbox"/> |
| Hardness, Total Cu and Zn | HDPE | 500 ml | 1 | HNO ₃ | <input checked="" type="checkbox"/> |

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID: _____
Filter blank sample ID: _____
Transfer blank sample ID: _____

Visual and Olfactory Conditions:
Clarity: clear
Color: none
Odor: _____
Sheen: _____
Floatables: org debris
LABORATORY DELIVERY

Date: _____ Time: _____

Quality Assurance

Checked By: John Lenth Signature: [Signature]
Date Checked: 12-01-17 Time: _____
Data Entered into Database? YES NO initials:
Date Entered: _____ Time: _____
Notes: _____

Field Meter Calibration

Check which field meter was used and complete the meter calibration form
YSI Pro Plus (15D100020) _____
YSI Pro DSS 1 _____
YSI Pro DSS 2 X

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)
Stream Stage (ft): 6.67
Reference Point (description): _____

Water Quality Measurements

Temperature (°C) 8.2
Specific Conductivity (µs/cm) 305.5
Dissolved Oxygen (mg/L) 9.05

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: Bob

Sample Date: 11.19.17 Sample Time: 2:30 PDT

Base Flow or Storm Event? (circled) Field Filtered Time: 2:35 PST (Must filter within 15 minutes of collection)

SITE ID: MONM

Project Number: 14-05806-000



Project Name: Redmond Paired Watershed Study

Current Weather and Temp: Drizzle 41°F

Water Quality Sampling

Sample ID: MONM-20171119

| Parameter | Bottle Type | Bottle Volume | # Bottles | Preservative | Duplicated? |
|---------------------------|-------------|---------------|-----------|--------------------------------|-------------|
| TSS and Turbidity | HDPE | 1L | 1 | NA | <u>N</u> |
| DOC * | HDPE | 250 ml | 1 | HCL | ↓ |
| Fecal Col. Bact. | HDPE | 250 ml | 1 | EDTA | |
| T. Phosphorous | HDPE | 250 ml | 1 | H ₂ SO ₄ | |
| T Nitrogen | HDPE | 250 ml | 1 | H ₂ SO ₄ | |
| Diss. Cu and Zn * | HDPE | 250 ml | 1 | HNO ₃ | |
| Hardness, Total Cu and Zn | HDPE | 500 ml | 1 | HNO ₃ | |

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID: _____

Filter blank sample ID: _____

Transfer blank sample ID: _____

Visual and Olfactory Conditions:

Clarity: clear

Color: none

Odor: _____

Sheen: _____

Floatables: _____

LABORATORY DELIVERY

Date: _____ Time: _____

Quality Assurance

Checked By: John Heath Signature: [Signature]

Date Checked: 12-4-17 Time: _____

Data Entered into Database? YES NO initials: _____

Date Entered: _____ Time: _____

Notes: _____

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

YSI Pro Plus (15D100020) _____

YSI Pro DSS 1 _____

YSI Pro DSS 2 _____

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): NA

Reference Point (description): NA

Water Quality Measurements

Temperature (°C) 8.3

Specific Conductivity (µs/cm) 203.2

Dissolved Oxygen (mg/L) 11.48

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: AS/MW

Sample Date: 11-19-17

Sample Time: 2025

PDT:

Base Flow or Storm Event? 0

Field Filtered Time: 2030

PST: X

(Must filter within 15 minutes of collection)

SITE

ID: SELMN

Project Number: 14-05806-000



HERRERA

Project Name: Redmond Paired Watershed Study

Current Weather and Temp: Light Rain, 40°F

Water Quality Sampling

Sample ID: SELMN

| Parameter | Bottle Type | Bottle Volume | # Bottles | Preservative | Duplicated? |
|---------------------------|-------------|---------------|-----------|--------------------------------|-------------|
| TSS and Turbidity | HDPE | 1L | 1 | NA | <u>N</u> |
| DOC * | HDPE | 250 ml | 1 | HCL | <u>N</u> |
| Fecal Col. Bact. | HDPE | 250 ml | 1 | EDTA | <u>N</u> |
| T. Phosphorous | HDPE | 250 ml | 1 | H ₂ SO ₄ | <u>N</u> |
| T. Nitrogen | HDPE | 250 ml | 1 | H ₂ SO ₄ | <u>N</u> |
| Diss. Cu and Zn * | HDPE | 250 ml | 1 | HNO ₃ | <u>N</u> |
| Hardness, Total Cu and Zn | HDPE | 500 ml | 1 | HNO ₃ | <u>N</u> |

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID: ---

Filter blank sample ID: ---

Transfer blank sample ID: ---

Visual and Olfactory Conditions:

Clarity: CLEAR

Color: NONE

Odor: ---

Sheen: ---

Floatables: ---

LABORATORY DELIVERY

Date:

Time:

Quality Assurance

Checked By: John Lenth

Signature: [Signature]

Date Checked: 11-19-17

Time:

Data Entered into Database?

YES

NO

initials:

Date Entered:

Time:

Notes:

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

YSI Pro Plus (15D100020) ---

YSI Pro DSS 1 X

YSI Pro DSS 2 ---

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): 7 7/8 INCHES

Reference Point (description): FRONT OF NOT TO H₂O SURFACE

Water Quality Measurements

Temperature (°C) 7.1

Specific Conductivity (µs/cm) 80.2

Dissolved Oxygen (mg/L) 11.64

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: AS/VW
 Sample Date: 11/19/17 Sample Time: 1940 PDT:
 Base Flow or Storm Event? Storm Event? Field Filtered Time: 1945 PST: X
 (Must filter within 15 minutes of collection)

SITE ID: SEIMS
 Project Number: 14-05806-000



Project Name: Redmond Paired Watershed Study

Current Weather and Temp: STEADY RAIN, 42°F

Water Quality Sampling

Sample ID: SEIMS20171119

| Parameter | Bottle Type | Bottle Volume | # Bottles | Preservative | Duplicated? |
|---------------------------|-------------|---------------|-----------|--------------------------------|-------------|
| TSS and Turbidity | HDPE | 1L | 1 | NA | <u>N</u> |
| DOC * | HDPE | 250 ml | 1 | HCL | <u>N</u> |
| Fecal Col. Bact. | HDPE | 250 ml | 1 | EDTA | <u>N</u> |
| T. Phosphorous | HDPE | 250 ml | 1 | H ₂ SO ₄ | <u>N</u> |
| T. Nitrogen | HDPE | 250 ml | 1 | H ₂ SO ₄ | <u>N</u> |
| Diss. Cu and Zn * | HDPE | 250 ml | 1 | HNO ₃ | <u>N</u> |
| Hardness, Total Cu and Zn | HDPE | 500 ml | 1 | HNO ₃ | <u>X</u> |

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID: _____
 Filter blank sample ID: _____
 Transfer blank sample ID: _____

Visual and Olfactory Conditions:

Clarity: clear
 Color: slight tan / yellow
 Odor: none
 Sheen: ↓
 Floatables: _____

LABORATORY DELIVERY

Date: _____ Time: _____

Quality Assurance

Checked By: John Lenth Signature: [Signature]
 Date Checked: 12-4-17 Time: _____
 Data Entered into Database? YES X NO _____ initials: _____
 Date Entered: _____ Time: _____
 Notes: _____

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

YSI Pro Plus (15D100020) _____
 YSI Pro DSS 1 X _____
 YSI Pro DSS 2 _____

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): 0.77
 Reference Point (description): SB

Water Quality Measurements

Temperature (°C) 7.1
 Specific Conductivity (µs/cm) 113.8
 Dissolved Oxygen (mg/L) 11.36

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: A SVENDSW / V WU
 Sample Date: 11/19/17 Sample Time: 1755 PDT: _____
 Base Flow or Storm Event? _____ Field Filtered Time: 1800 PST: X
(Must filter within 15 minutes of collection)

SITE ID: TOSM1
 Project Number: 14-05806-000



Project Name: Redmond Paired Watershed Study
 Current Weather and Temp: RAIN, 46°F

Water Quality Sampling

Sample ID: TOSM120171119

| Parameter | Bottle Type | Bottle Volume | # Bottles | Preservative | Duplicated? |
|---------------------------|-------------|---------------|-----------|--------------------------------|-------------|
| TSS and Turbidity | HDPE | 1L | 1 | NA | <u>N</u> |
| DOC * | HDPE | 250 ml | 1 | HCL | <u>N</u> |
| Fecal Col. Bact. | HDPE | 250 ml | 1 | EDTA | <u>N</u> |
| T. Phosphorous | HDPE | 250 ml | 1 | H ₂ SO ₄ | <u>N</u> |
| T Nitrogen | HDPE | 250 ml | 1 | H ₂ SO ₄ | <u>N</u> |
| Diss. Cu and Zn * | HDPE | 250 ml | 1 | HNO ₃ | <u>Y</u> |
| Hardness, Total Cu and Zn | HDPE | 500 ml | 1 | HNO ₃ | <u>Y</u> |

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID: _____
 Filter blank sample ID: _____
 Transfer blank sample ID: _____

Visual and Olfactory Conditions:

Clarity: SUCH THAT I CAN SEE THROUGH
 Color: MOSTLY CLEAR
 Odor: SLIGHT SEPTIC SMELL
 Sheen: NONE
 Floatables: FOAM

LABORATORY DELIVERY

Date: _____ Time: _____

Quality Assurance

Checked By: John Lenth Signature: [Signature]
 Date Checked: 12-4-17 Time: _____
 Data Entered into Database? YES NO initials: _____
 Date Entered: _____ Time: _____
 Notes: _____

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

YSI Pro Plus (15D100020) _____
 YSI Pro DSS 1 [initials]
 YSI Pro DSS 2 _____

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): 0.91
 Reference Point (description): SG

Water Quality Measurements

Temperature (°C) 9.5
 Specific Conductivity (µs/cm) 190.0
 Dissolved Oxygen (mg/L) 11.92

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: BB

Sample Date: 11.19.17

Sample Time: 1835

PDT:

SITE ID:

TOSMO

Base Flow or Storm Event? (circled)

Field Filtered Time: 1840

PST: X

Project Number: 14-05806-000



HERRERA

Project Name: Redmond Paired Watershed Study

Current Weather and Temp: Raining 43°F

Water Quality Sampling

Sample ID: TOSMO-20171119

| Parameter | Bottle Type | Bottle Volume | # Bottles | Preservative | Duplicated? |
|---------------------------|-------------|---------------|-----------|--------------------------------|-------------|
| TSS and Turbidity | HDPE | 1L | 1 | NA | <u>N</u> |
| DOC * | HDPE | 250 ml | 1 | HCL | |
| Fecal Col. Bact. | HDPE | 250 ml | 1 | EDTA | |
| T. Phosphorous | HDPE | 250 ml | 1 | H ₂ SO ₄ | |
| T. Nitrogen | HDPE | 250 ml | 1 | H ₂ SO ₄ | |
| Diss. Cu and Zn * | HDPE | 250 ml | 1 | HNO ₃ | |
| Hardness, Total Cu and Zn | HDPE | 500 ml | 1 | HNO ₃ | |

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID: _____
 Filter blank sample ID: _____
 Transfer blank sample ID: _____

Visual and Olfactory Conditions:

Clarity: clear
 Color: none light gray
 Odor: _____
 Sheen: _____
 Floatables: org debris

LABORATORY DELIVERY

Date: _____ Time: _____

Quality Assurance

Checked By: John Leuth Signature: _____

Date Checked: 12-1-17 Time: _____

Data Entered into Database? YES NO initials: _____

Date Entered: _____ Time: _____

Notes: _____

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

YSI Pro Plus (15D100020) _____

YSI Pro DSS 1 _____

YSI Pro DSS 2 X

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): 0.69

Reference Point (description): SG

Water Quality Measurements

Temperature (°C) 9.1

Specific Conductivity (µs/cm) 222.8

Dissolved Oxygen (mg/L) 11.23

Had foam @ weir

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: PJB
 Sample Date: 11.19.17 Sample Time: 20:00 PDT
 Base Flow or Storm Event? Storm Event? Field Filtered Time: 2005 PST
(Must filter within 15 minutes of collection)

SITE ID: TYLMI
 Project Number: 14-05806-000



Project Name: Redmond Paired Watershed Study

Current Weather and Temp: Rainy 43°F

Water Quality Sampling

Sample ID: TYLMI-20171119

| Parameter | Bottle Type | Bottle Volume | # Bottles | Preservative | Duplicated? |
|---------------------------|-------------|---------------|-----------|--------------------------------|-------------|
| TSS and Turbidity | HDPE | 1L | 1 | NA | N |
| DOC * | HDPE | 250 ml | 1 | HCL | |
| Fecal Col. Bact. | HDPE | 250 ml | 1 | EDTA | |
| T. Phosphorous | HDPE | 250 ml | 1 | H ₂ SO ₄ | |
| T Nitrogen | HDPE | 250 ml | 1 | H ₂ SO ₄ | |
| Diss. Cu and Zn * | HDPE | 250 ml | 1 | HNO ₃ | |
| Hardness, Total Cu and Zn | HDPE | 500 ml | 1 | HNO ₃ | |

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID: _____
 Filter blank sample ID: _____
 Transfer blank sample ID: _____

Visual and Olfactory Conditions:

Clarity: clear
 Color: light brown
 Odor: none
 Sheen: none
 Floatables: suspended org debris
LABORATORY DELIVERY

Date: _____ Time: _____

Quality Assurance

Checked By: Susan Leuth Signature: [Signature]
 Date Checked: 12-4-17 Time: _____
 Data Entered into Database? YES NO initials:
 Date Entered: _____ Time: _____
 Notes: _____

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

YSI Pro Plus (15D100020) _____
 YSI Pro DSS 1 _____
 YSI Pro DSS 2 X

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): 2.51
 Reference Point (description): top of culvert

Water Quality Measurements

Temperature (°C) 8.8
 Specific Conductivity (µs/cm) 157.9
 Dissolved Oxygen (mg/L) 10.19

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: BPB
 Sample Date: 11.19.17 Sample Time: 1925 PDT: _____
 Base Flow or Storm Event? (circled) Field Filtered Time: 1930 PST: X
(Must filter within 15 minutes of collection)

SITE ID: TYLMO
 Project Number: 14-05806-000



Project Name: Redmond Paired Watershed Study

Current Weather and Temp: Raining 43°F

Water Quality Sampling

Sample ID: TYLMO-20171119

| Parameter | Bottle Type | Bottle Volume | # Bottles | Preservative | Duplicated? |
|---------------------------|-------------|---------------|-----------|--------------------------------|-------------|
| TSS and Turbidity | HDPE | 1L | 1 | NA | ✓ ↓ |
| DOC * | HDPE | 250 ml | 1 | HCL | |
| Fecal Col. Bact. | HDPE | 250 ml | 1 | EDTA | |
| T. Phosphorous | HDPE | 250 ml | 1 | H ₂ SO ₄ | |
| T. Nitrogen | HDPE | 250 ml | 1 | H ₂ SO ₄ | |
| Diss. Cu and Zn * | HDPE | 250 ml | 1 | HNO ₃ | |
| Hardness, Total Cu and Zn | HDPE | 500 ml | 1 | HNO ₃ | |

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID: QAZO-20171119 @ 1940
 Filter blank sample ID: NA
 Transfer blank sample ID: NA

Visual and Olfactory Conditions:

Clarity: clear
 Color: brown
 Odor: none
 Sheen: _____
 Floatables: org. debris, susp sed
LABORATORY DELIVERY

Date: _____ Time: _____

Quality Assurance

Checked By: John Lentz Signature: [Signature]
 Date Checked: 12-4-17 Time: _____
 Data Entered into Database? YES NO initials: _____
 Date Entered: _____ Time: _____
 Notes: _____

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

YSI Pro Plus (15D100020) _____
 YSI Pro DSS 1 _____
 YSI Pro DSS 2 X

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): 2.07
 Reference Point (description): top of culvert 1

Water Quality Measurements

Temperature (°C) 8.8
 Specific Conductivity (µs/cm) ~~11.07~~ 107.3
 Dissolved Oxygen (mg/L) ~~107.3~~ 11.07



HERRERA

Data Quality Assurance Worksheet

Project Name/No./Client: Redmond Paired Watershed Study / 14-05806-000 / City of Redmond

Laboratory/Parameters: OnSite Environmental : TSS, turbidity, hardness, DOC, TP, Dissolved & Total Cu, Zn / AmTest: Total nitrogen, fecal coliform bacteria

Sample Date/Sample ID: 11/19/2017 / All sites, 1 FD (QA36) at TYLMO

By G. Catarra

Date 12/12/2017 Page 1 of 2

Checked: initials JL

date 1/4/2017

| Parameter | Completeness/ Methodology | Pre-preservation Holding Times (minutes) | | Total Holding Times (days) | | Method Blanks Reporting Limit | Matrix Spikes/ Surrogate Recovery (%) | | Lab Control Samples Recovery (%) | | Lab Duplicates RPD (%) | | Field Duplicates RPD (%) | | Instrument Calibration/ Performance | ACTION |
|-------------------------------------|------------------------------|--|------|-------------------------------|------|--|---|-------------------|--|-------------------|---------------------------|-------------------|-----------------------------|-------------------|---|--|
| | | Reported | Goal | Reported | Goal | | Reported | Goal ¹ | Reported | Goal ¹ | Reported | Goal ¹ | Reported | Goal ¹ | | |
| TSS | OK / SM 2540D | NA | NA | 3 | ≤7 | ≤1.0 mg/L 1.0 mg/L | NA | NA | 94 | ±20 | 11 | ≤25 | 67 | ≤25 | OK | FLAG TYLMO DUE TO FD RPD |
| Turbidity | OK / EPA 180.1 | NA | NA | 2 | ≤2 | ≤0.1 NTU 0.1 NTU | NA | NA | NA | ±10 | 0 | ≤25 | 91 | ≤25 | OK | FLAG TYLMO DUE TO FD RPD |
| Hardness | OK / SM 2340B | NA | NA | 2 | ≤180 | ≤1.0 mg/L 1.0 mg/L | 104,103 | ±25 | 100 | ±15 | 2 | ≤20 | 8.3 | ≤20 | OK | NONE |
| DOC | OK / SM 5310B | <15 | ≤15 | 10 | ≤28 | ≤1.0 mg/L 1.0 mg/L | 88 | ±25 | 102 | ±15 | 0 | ≤20 | 7.9 | ≤20 | OK | NONE |
| Total Phosphorus | OK / EPA 365.1 | NA | NA | 9 | ≤28 | ≤0.01 mg/L 0.01 mg/L | 97 | ±25 | 96 | ±20 | 2 | ≤20 | 3.4 | ≤20 | OK | NONE |
| Total Nitrogen (TKN + N+N) | OK/ SM 4500 N-B | NA | NA | 11-16 | ≤28 | ≤0.1 mg/L 0.1 mg/L | 94-100 | ±25 | 93-100 | ±20 | 0.48-5.6 | ≤20 | 73, 50 | ≤20 | OK | FLAG TKN AND N+N RESULT FOR YYLMO DUE TO FD RPD. |

¹ If the sample or duplicate value is less than five times the reporting limit, the difference is calculated rather than the relative percent difference (RPD). The QA goal is a difference <2 times the detection limit instead of the number indicated in the goal column.

NA – not applicable or not available; NC – not calculable due to one or more values below the detection limit; NS – field duplicate not sampled.



Data Quality Assurance Worksheet

By G. Catarra

Project Name/No./Client: Redmond Paired Watershed Study / 14-05806-000 / City of Redmond

Date 12/12/2017 Page 2 of 2

Laboratory/Parameters: OnSite Environmental : TSS, turbidity, hardness, DOC, TP, Dissolved & Total Cu, Zn / AmTest: total nitrogen, fecal coliform bacteria

Checked: initials JL

Sample Date/Sample ID: 11/19/2017 / All sites, 1 FD (QA36) at TYLMO

date 1/4/2017

| Parameter | Completeness/ Methodology | Pre-preservation Holding Times (minutes) | | Total Holding Times (days) | | Method Blanks Reporting Limit | Matrix Spikes/ Surrogate Recovery (%) | | Lab Control Samples Recovery (%) | | Lab Duplicates RPD (%) | | Field Duplicates RPD (%) | | Instrument Calibration/ Performance | ACTION |
|---------------------|------------------------------|--|------|-------------------------------|------|--|---|-------------------|--|------|---------------------------|-------------------|-----------------------------|-------------------|---|-----------------------------|
| | | Reported | Goal | Reported | Goal | | Reported | Goal ¹ | Reported | Goal | Reported | Goal ¹ | Reported | Goal ¹ | | |
| Total Copper | OK/ EPA 200.8 | NA | NA | 9 | ≤180 | ≤1.0 µg/L 1.0 µg/L | 101,103 | ±25 | NR | ±15 | NC | ≤20 | 28 | ≤20 | OK | FLAG TYLMO DUE TO FD RPD |
| Total Zinc | OK/ EPA 200.8 | NA | NA | 9 | ≤180 | ≤5.0 µg/L 5.0 µg/L | 107,113 | ±25 | NR | ±15 | NC | ≤20 | 60 | ≤20 | OK | FLAG TYLMO DUE TO FD RPD |
| Dissolved Copper | OK/ EPA 200.8 | <15 | ≤15 | 2 | ≤180 | ≤1.0 µg/L 1.0 µg/L | 70,71 BATCH | ±25 | NR | ±15 | 1 | ≤20 | 15 | ≤20 | OK | NO FLAG, BATCH SAMPLE |
| Dissolved Zinc | OK/ EPA 200.8 | <15 | ≤15 | 2 | ≤180 | ≤5.0 µg/L 5.0 µg/L | 89,89 | ±25 | NR | ±15 | 5 | ≤20 | 15 | ≤20 | OK | NONE |
| Fecal Coliform | OK / SM 9222D | NA | NA | 1 | ≤1 | ≤1.0 cfu/ 100mL 10 cfu/ 100mL | NA | NA | NA | NA | D=10 ,15 | ≤35 | 40 | ≤50 | OK | NONE |

¹ If the sample or duplicate value is less than five times the reporting limit, the difference is calculated rather than the relative percent difference (RPD). The QA goal is a difference <2 times the detection limit instead of the number indicated in the goal column.

NA – not applicable or not available; NC – not calculable due to one or more values below the detection limit; NS – field duplicate not sampled.



14648 NE 95th Street, Redmond, WA 98052 • (425) 883-3881

January 3, 2018

George Iftner
Herrera Environmental Consultants, Inc.
2200 6th Avenue, Suite 1100
Seattle, WA 98121

Re: Analytical Data for Project 14-05806-000
Laboratory Reference No. 1712-101

Dear George:

Enclosed are the analytical results and associated quality control data for samples submitted on December 11, 2017.

The standard policy of OnSite Environmental, Inc. is to store your samples for 30 days from the date of receipt. If you require longer storage, please contact the laboratory.

We appreciate the opportunity to be of service to you on this project. If you have any questions concerning the data, or need additional information, please feel free to call me.

Sincerely,

A handwritten signature in black ink, appearing to read "Blair Goodrow", enclosed within a large, loopy, circular scribble.

Blair Goodrow
Project Manager

Enclosures



OnSite Environmental, Inc. 14648 NE 95th Street, Redmond, WA 98052 (425) 883-3881

This report pertains to the samples analyzed in accordance with the chain of custody, and is intended only for the use of the individual or company to whom it is addressed.

Date of Report: January 3, 2018
Samples Submitted: December 11, 2017
Laboratory Reference: 1712-101
Project: 14-05806-000

Case Narrative

Samples were collected on December 11, 2017 and received by the laboratory on December 11, 2017. They were maintained at the laboratory at a temperature of 2°C to 6°C.

Please note that any and all soil sample results are reported on a dry-weight basis, unless otherwise noted below.

General QA/QC issues associated with the analytical data enclosed in this laboratory report will be indicated with a reference to a comment or explanation on the Data Qualifier page. More complex and involved QA/QC issues will be discussed in detail below.



Date of Report: January 3, 2018
 Samples Submitted: December 11, 2017
 Laboratory Reference: 1712-101
 Project: 14-05806-000

**TOTAL SUSPENDED SOLIDS
 SM 2540D**

Matrix: Water
 Units: mg/L

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|------------------------|----------------------|-----|----------|---------------|---------------|-------|
| Client ID: | COLM-20171211 | | | | | |
| Laboratory ID: | 12-101-01 | | | | | |
| Total Suspended Solids | ND | 1.0 | SM 2540D | 12-13-17 | 12-14-17 | |

| | | | | | | |
|------------------------|----------------------|-----|----------|----------|----------|--|
| Client ID: | QA38 20171211 | | | | | |
| Laboratory ID: | 12-101-03 | | | | | |
| Total Suspended Solids | ND | 1.0 | SM 2540D | 12-13-17 | 12-14-17 | |



Date of Report: January 3, 2018
 Samples Submitted: December 11, 2017
 Laboratory Reference: 1712-101
 Project: 14-05806-000

**TOTAL SUSPENDED SOLIDS
 SM 2540D
 QUALITY CONTROL**

Matrix: Water
 Units: mg/L

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|------------------------|-----------|-----|----------|---------------|---------------|-------|
| METHOD BLANK | | | | | | |
| Laboratory ID: | MB1213W1 | | | | | |
| Total Suspended Solids | ND | 1.0 | SM 2540D | 12-13-17 | 12-14-17 | |

| Analyte | Result | Spike Level | Source Result | Percent Recovery | Recovery Limits | RPD | RPD Limit | Flags |
|------------------------|-----------|-------------|---------------|------------------|-----------------|-----|-----------|-------|
| DUPLICATE | | | | | | | | |
| Laboratory ID: | 12-101-03 | | | | | | | |
| | ORIG | DUP | | | | | | |
| Total Suspended Solids | ND | ND | NA | NA | NA | NA | 17 | |

| | | | | | | | | |
|------------------------|-------------|-----|----|----|--------|----|----|--|
| SPIKE BLANK | | | | | | | | |
| Laboratory ID: | SB1213W1 | | | | | | | |
| | SB | SB | | SB | | | | |
| Total Suspended Solids | 91.0 | 100 | NA | 91 | 76-114 | NA | NA | |



Date of Report: January 3, 2018
 Samples Submitted: December 11, 2017
 Laboratory Reference: 1712-101
 Project: 14-05806-000

TURBIDITY
EPA 180.1

Matrix: Water
 Units: NTU

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|-------------------|----------------------|------|-----------|---------------|---------------|-------|
| Client ID: | COLM-20171211 | | | | | |
| Laboratory ID: | 12-101-01 | | | | | |
| Turbidity | 0.41 | 0.10 | EPA 180.1 | 12-13-17 | 12-13-17 | |

| | | | | | | |
|-------------------|----------------------|------|-----------|----------|----------|--|
| Client ID: | QA38 20171211 | | | | | |
| Laboratory ID: | 12-101-03 | | | | | |
| Turbidity | 0.14 | 0.10 | EPA 180.1 | 12-13-17 | 12-13-17 | |



Date of Report: January 3, 2018
 Samples Submitted: December 11, 2017
 Laboratory Reference: 1712-101
 Project: 14-05806-000

**TURBIDITY
 EPA 180.1
 QUALITY CONTROL**

Matrix: Water
 Units: NTU

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|---------------------|-----------|------|-----------|---------------|---------------|-------|
| METHOD BLANK | | | | | | |
| Laboratory ID: | MB1213W1 | | | | | |
| Turbidity | ND | 0.10 | EPA 180.1 | 12-13-17 | 12-13-17 | |

| Analyte | Result | Spike Level | Source Result | Percent Recovery | Recovery Limits | RPD | RPD Limit | Flags |
|------------------|--------------|--------------|---------------|------------------|-----------------|-----|-----------|-------|
| DUPLICATE | | | | | | | | |
| Laboratory ID: | 12-101-01 | | | | | | | |
| | ORIG | DUP | | | | | | |
| Turbidity | 0.410 | 0.400 | NA | NA | NA | NA | 2 | 15 |



Date of Report: January 3, 2018
 Samples Submitted: December 11, 2017
 Laboratory Reference: 1712-101
 Project: 14-05806-000

HARDNESS
EPA 200.7/SM 2340B

Matrix: Water
 Units: mg eqt. CaCO₃/L (ppm)

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|-------------------|----------------------|-----|----------------|---------------|---------------|-------|
| Client ID: | COLM-20171211 | | | | | |
| Laboratory ID: | 12-101-01 | | | | | |
| Hardness | 10 | 1.0 | 200.7/SM 2340B | 12-14-17 | 12-14-17 | |

| | | | | | | |
|-------------------|----------------------|-----|----------------|----------|----------|--|
| Client ID: | QA38 20171211 | | | | | |
| Laboratory ID: | 12-101-03 | | | | | |
| Hardness | ND | 1.0 | 200.7/SM 2340B | 12-14-17 | 12-14-17 | |



Date of Report: January 3, 2018
 Samples Submitted: December 11, 2017
 Laboratory Reference: 1712-101
 Project: 14-05806-000

HARDNESS
EPA 200.7/SM 2340B
QUALITY CONTROL

Matrix: Water
 Units: mg eqt. CaCO₃/L (ppm)

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|---------------------|-----------|-----|----------------|---------------|---------------|-------|
| METHOD BLANK | | | | | | |
| Laboratory ID: | MB1214WH1 | | | | | |
| Hardness | ND | 1.0 | 200.7/SM 2340B | 12-14-17 | 12-14-17 | |

| Analyte | Result | Spike Level | Source Result | Percent Recovery | Recovery Limits | RPD | RPD Limit | Flags |
|------------------|-------------|-------------|---------------|------------------|-----------------|-----|-----------|-------|
| DUPLICATE | | | | | | | | |
| Laboratory ID: | 12-112-01 | | | | | | | |
| | ORIG | DUP | | | | | | |
| Hardness | 80.5 | 80.1 | NA | NA | NA | 0 | 20 | |

| Analyte | Result | Spike Level | Source Result | Percent Recovery | Recovery Limits | RPD | RPD Limit | Flags | | |
|----------------------|------------|-------------|---------------|------------------|-----------------|-----|-----------|--------|---|----|
| MATRIX SPIKES | | | | | | | | | | |
| Laboratory ID: | 12-112-01 | | | | | | | | | |
| | MS | MSD | MS | MSD | MS | MSD | | | | |
| Hardness | 206 | 215 | 132 | 132 | 80.5 | 95 | 102 | 75-125 | 4 | 20 |

| Analyte | Result | Spike Level | Source Result | Percent Recovery | Recovery Limits | RPD | RPD Limit | Flags |
|--------------------|------------|-------------|---------------|------------------|-----------------|-----|-----------|-------|
| SPIKE BLANK | | | | | | | | |
| Laboratory ID: | SB1214WH1 | | | | | | | |
| | SB | SB | | | SB | | | |
| Hardness | 127 | 132 | NA | 96 | 80-120 | NA | NA | |



Date of Report: January 3, 2018
 Samples Submitted: December 11, 2017
 Laboratory Reference: 1712-101
 Project: 14-05806-000

**DISSOLVED ORGANIC CARBON
 SM 5310B**

Matrix: Water
 Units: mg/L

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|--------------------------|----------------------|-----|----------|---------------|---------------|-------|
| Client ID: | COLM-20171211 | | | | | |
| Laboratory ID: | 12-101-01 | | | | | |
| Dissolved Organic Carbon | 13 | 1.0 | SM 5310B | 12-13-17 | 12-13-17 | |
| Client ID: | QA37-20171211 | | | | | |
| Laboratory ID: | 12-101-02 | | | | | |
| Dissolved Organic Carbon | ND | 1.0 | SM 5310B | 12-13-17 | 12-13-17 | |
| Client ID: | QA38 20171211 | | | | | |
| Laboratory ID: | 12-101-03 | | | | | |
| Dissolved Organic Carbon | ND | 1.0 | SM 5310B | 12-13-17 | 12-13-17 | |



Date of Report: January 3, 2018
 Samples Submitted: December 11, 2017
 Laboratory Reference: 1712-101
 Project: 14-05806-000

**DISSOLVED ORGANIC CARBON
 SM 5310B
 QUALITY CONTROL**

Matrix: Water
 Units: mg/L

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|--------------------------|-----------|-----|----------|---------------|---------------|-------|
| METHOD BLANK | | | | | | |
| Laboratory ID: | MB1213D1 | | | | | |
| Dissolved Organic Carbon | ND | 1.0 | SM 5310B | 12-13-17 | 12-13-17 | |

| Analyte | Result | Spike Level | Source Result | Percent Recovery | Recovery Limits | RPD | RPD Limit | Flags |
|--------------------------|-------------|-------------|---------------|------------------|-----------------|-----|-----------|-------|
| DUPLICATE | | | | | | | | |
| Laboratory ID: | 12-101-01 | | | | | | | |
| | ORIG | DUP | | | | | | |
| Dissolved Organic Carbon | 12.9 | 13.1 | NA | NA | NA | 2 | 15 | |

MATRIX SPIKE

| | | | | | | | | |
|--------------------------|-------------|------|------|----|--------|----|----|--|
| Laboratory ID: | 12-101-01 | | | | | | | |
| | MS | MS | | MS | | | | |
| Dissolved Organic Carbon | 22.0 | 10.0 | 12.9 | 91 | 75-125 | NA | NA | |

SPIKE BLANK

| | | | | | | | | |
|--------------------------|-------------|------|----|-----|--------|----|----|--|
| Laboratory ID: | SB1213D1 | | | | | | | |
| | SB | SB | | SB | | | | |
| Dissolved Organic Carbon | 10.0 | 10.0 | NA | 100 | 80-120 | NA | NA | |



Date of Report: January 3, 2018
 Samples Submitted: December 11, 2017
 Laboratory Reference: 1712-101
 Project: 14-05806-000

TOTAL PHOSPHORUS
EPA 365.1

Matrix: Water
 Units: mg/L

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|-------------------|----------------------|-------|-----------|---------------|---------------|-------|
| Client ID: | COLM-20171211 | | | | | |
| Laboratory ID: | 12-101-01 | | | | | |
| Total Phosphorus | 0.010 | 0.010 | EPA 365.1 | 12-18-17 | 12-18-17 | |

| | | | | | | |
|-------------------|----------------------|-------|-----------|----------|----------|--|
| Client ID: | QA38 20171211 | | | | | |
| Laboratory ID: | 12-101-03 | | | | | |
| Total Phosphorus | ND | 0.010 | EPA 365.1 | 12-18-17 | 12-18-17 | |



Date of Report: January 3, 2018
 Samples Submitted: December 11, 2017
 Laboratory Reference: 1712-101
 Project: 14-05806-000

**TOTAL PHOSPHORUS
 EPA 365.1
 QUALITY CONTROL**

Matrix: Water
 Units: mg/L

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|---------------------|-----------|-------|-----------|---------------|---------------|-------|
| METHOD BLANK | | | | | | |
| Laboratory ID: | MB1218W1 | | | | | |
| Total Phosphorus | ND | 0.010 | EPA 365.1 | 12-18-17 | 12-18-17 | |

| Analyte | Result | Spike Level | Source Result | Percent Recovery | Recovery Limits | RPD | RPD Limit | Flags |
|------------------|---------------|---------------|---------------|------------------|-----------------|-----|-----------|-------|
| DUPLICATE | | | | | | | | |
| Laboratory ID: | 12-101-01 | | | | | | | |
| | ORIG | DUP | | | | | | |
| Total Phosphorus | 0.0103 | 0.0104 | NA | NA | NA | 1 | 11 | |

| | | | | | | | | |
|---------------------|--------------|-------|--------|-----|--------|----|----|--|
| MATRIX SPIKE | | | | | | | | |
| Laboratory ID: | 12-101-01 | | | | | | | |
| | MS | MS | | MS | | | | |
| Total Phosphorus | 0.260 | 0.250 | 0.0103 | 100 | 82-124 | NA | NA | |

| | | | | | | | | |
|--------------------|--------------|-------|----|----|--------|----|----|--|
| SPIKE BLANK | | | | | | | | |
| Laboratory ID: | SB1218W1 | | | | | | | |
| | SB | SB | | SB | | | | |
| Total Phosphorus | 0.241 | 0.250 | NA | 96 | 87-114 | NA | NA | |



Date of Report: January 3, 2018
 Samples Submitted: December 11, 2017
 Laboratory Reference: 1712-101
 Project: 14-05806-000

**TOTAL METALS
 EPA 200.8**

Matrix: Water
 Units: ug/L (ppb)

| Analyte | Result | PQL | EPA Method | Date Prepared | Date Analyzed | Flags |
|-------------------|----------------------|------------|-------------------|----------------------|----------------------|--------------|
| Lab ID: | 12-101-01 | | | | | |
| Client ID: | COLM-20171211 | | | | | |
| Copper | 1.2 | 1.0 | 200.8 | 12-12-17 | 12-13-17 | |
| Zinc | ND | 5.0 | 200.8 | 12-12-17 | 12-13-17 | |

| | | | | | | |
|-------------------|----------------------|-----|-------|----------|----------|--|
| Lab ID: | 12-101-03 | | | | | |
| Client ID: | QA38 20171211 | | | | | |
| Copper | 5.8 | 1.0 | 200.8 | 12-12-17 | 12-13-17 | |
| Zinc | ND | 5.0 | 200.8 | 12-12-17 | 12-13-17 | |



Date of Report: January 3, 2018
Samples Submitted: December 11, 2017
Laboratory Reference: 1712-101
Project: 14-05806-000

**TOTAL METALS
EPA 200.8
METHOD BLANK QUALITY CONTROL**

Date Extracted: 12-12-17
Date Analyzed: 12-13-17

Matrix: Water
Units: ug/L (ppb)

Lab ID: MB1212WH1

| Analyte | Method | Result | PQL |
|---------|--------|-----------|-----|
| Copper | 200.8 | ND | 1.0 |
| Zinc | 200.8 | ND | 5.0 |



Date of Report: January 3, 2018
Samples Submitted: December 11, 2017
Laboratory Reference: 1712-101
Project: 14-05806-000

**TOTAL METALS
EPA 200.8
DUPLICATE QUALITY CONTROL**

Date Extracted: 12-12-17
Date Analyzed: 12-13-17

Matrix: Water
Units: ug/L (ppb)

Lab ID: 12-240-05

| Analyte | Sample Result | Duplicate Result | RPD | PQL | Flags |
|---------|---------------|------------------|-----|-----|-------|
| Copper | ND | ND | NA | 1.0 | |
| Zinc | ND | ND | NA | 5.0 | |



Date of Report: January 3, 2018
 Samples Submitted: December 11, 2017
 Laboratory Reference: 1712-101
 Project: 14-05806-000

**TOTAL METALS
 EPA 200.8
 MS/MSD QUALITY CONTROL**

Date Extracted: 12-12-17

Date Analyzed: 12-13-17

Matrix: Water

Units: ug/L (ppb)

Lab ID: 12-240-05

| Analyte | Spike Level | MS | Percent Recovery | MSD | Percent Recovery | RPD | Flags |
|---------|-------------|-------------|------------------|------------|------------------|-----|-------|
| Copper | 100 | 98.2 | 98 | 105 | 105 | 6 | |
| Zinc | 100 | 108 | 108 | 116 | 116 | 7 | |



Date of Report: January 3, 2018
 Samples Submitted: December 11, 2017
 Laboratory Reference: 1712-101
 Project: 14-05806-000

DISSOLVED METALS
EPA 200.8

Matrix: Water
 Units: ug/L (ppb)

| Analyte | Result | PQL | EPA Method | Date Prepared | Date Analyzed | Flags |
|-------------------|----------------------|-----|------------|---------------|---------------|-------|
| Lab ID: | 12-101-01 | | | | | |
| Client ID: | COLM-20171211 | | | | | |
| Copper | 1.9 | 1.0 | 200.8 | | 12-13-17 | |
| Zinc | ND | 5.0 | 200.8 | | 12-13-17 | |
| Lab ID: | 12-101-02 | | | | | |
| Client ID: | QA37-20171211 | | | | | |
| Copper | 4.1 | 1.0 | 200.8 | | 12-13-17 | |
| Zinc | ND | 5.0 | 200.8 | | 12-13-17 | |
| Lab ID: | 12-101-03 | | | | | |
| Client ID: | QA38 20171211 | | | | | |
| Copper | 5.5 | 1.0 | 200.8 | | 12-13-17 | |
| Zinc | ND | 5.0 | 200.8 | | 12-13-17 | |



Date of Report: January 3, 2018
Samples Submitted: December 11, 2017
Laboratory Reference: 1712-101
Project: 14-05806-000

**DISSOLVED METALS
EPA 200.8
METHOD BLANK QUALITY CONTROL**

Date Analyzed: 12-13-17

Matrix: Water
Units: ug/L (ppb)

Lab ID: MB1212F1

| Analyte | Method | Result | PQL |
|---------|--------|-----------|-----|
| Copper | 200.8 | ND | 1.0 |
| Zinc | 200.8 | ND | 5.0 |



Date of Report: January 3, 2018
Samples Submitted: December 11, 2017
Laboratory Reference: 1712-101
Project: 14-05806-000

**DISSOLVED METALS
EPA 200.8
DUPLICATE QUALITY CONTROL**

Date Analyzed: 12-13-17

Matrix: Water
Units: ug/L (ppb)

Lab ID: 12-113-01

| Analyte | Sample Result | Duplicate Result | RPD | PQL | Flags |
|---------|------------------|---------------------|-----|-----|-------|
| Copper | 2.38 | 2.42 | 2 | 1.0 | |
| Zinc | 19.4 | 19.9 | 2 | 5.0 | |



Date of Report: January 3, 2018
 Samples Submitted: December 11, 2017
 Laboratory Reference: 1712-101
 Project: 14-05806-000

**DISSOLVED METALS
 EPA 200.8
 MS/MSD QUALITY CONTROL**

Date Analyzed: 12-13-17

Matrix: Water
 Units: ug/L (ppb)

Lab ID: 12-113-01

| Analyte | Spike Level | MS | Percent Recovery | MSD | Percent Recovery | RPD | Flags |
|---------|-------------|-------------|------------------|-------------|------------------|-----|-------|
| Copper | 80.0 | 86.2 | 105 | 86.0 | 105 | 0 | |
| Zinc | 80.0 | 113 | 117 | 112 | 116 | 1 | |





Data Qualifiers and Abbreviations

- A - Due to a high sample concentration, the amount spiked is insufficient for meaningful MS/MSD recovery data.
 - B - The analyte indicated was also found in the blank sample.
 - C - The duplicate RPD is outside control limits due to high result variability when analyte concentrations are within five times the quantitation limit.
 - E - The value reported exceeds the quantitation range and is an estimate.
 - F - Surrogate recovery data is not available due to the high concentration of coeluting target compounds.
 - H - The analyte indicated is a common laboratory solvent and may have been introduced during sample preparation, and be impacting the sample result.
 - I - Compound recovery is outside of the control limits.
 - J - The value reported was below the practical quantitation limit. The value is an estimate.
 - K - Sample duplicate RPD is outside control limits due to sample inhomogeneity. The sample was re-extracted and re-analyzed with similar results.
 - L - The RPD is outside of the control limits.
 - M - Hydrocarbons in the gasoline range are impacting the diesel range result.
 - M1 - Hydrocarbons in the gasoline range (toluene-naphthalene) are present in the sample.
 - N - Hydrocarbons in the lube oil range are impacting the diesel range result.
 - N1 - Hydrocarbons in diesel range are impacting lube oil range results.
 - O - Hydrocarbons indicative of heavier fuels are present in the sample and are impacting the gasoline result.
 - P - The RPD of the detected concentrations between the two columns is greater than 40.
 - Q - Surrogate recovery is outside of the control limits.
 - S - Surrogate recovery data is not available due to the necessary dilution of the sample.
 - T - The sample chromatogram is not similar to a typical _____.
 - U - The analyte was analyzed for, but was not detected above the reported sample quantitation limit.
 - U1 - The practical quantitation limit is elevated due to interferences present in the sample.
 - V - Matrix Spike/Matrix Spike Duplicate recoveries are outside control limits due to matrix effects.
 - W - Matrix Spike/Matrix Spike Duplicate RPD are outside control limits due to matrix effects.
 - X - Sample extract treated with a mercury cleanup procedure.
 - X1 - Sample extract treated with a sulfuric acid/silica gel cleanup procedure.
 - Y - The calibration verification for this analyte exceeded the 20% drift specified in method 8260C, and therefore the reported result should be considered an estimate. The overall performance of the calibration verification standard met the acceptance criteria of the method.
 - Z -
- ND - Not Detected at PQL
 PQL - Practical Quantitation Limit
 RPD - Relative Percent Difference





Am Test Inc.
13600 NE 126TH PL
Suite C
Kirkland, WA 98034
(425) 885-1664

Professional
Analytical
Services

Jan 3 2018
On-Site Environmental
14648 NE 95th ST
Redmond, WA 98052
Attention: David Baumeister

Dear David Baumeister:

Enclosed please find the analytical data for your project.

The following is a cross correlation of client and laboratory identifications for your convenience.

| CLIENT ID | MATRIX | AMTEST ID | TEST |
|---------------|--------|------------|------------|
| COLM-20171211 | Water | 17-A021774 | Micro, NUT |
| QA38-20171211 | Water | 17-A021775 | Micro, NUT |

Your samples were received on Monday, December 11, 2017. At the time of receipt, the samples were logged in and properly maintained prior to the subsequent analysis.

The analytical procedures used at AmTest are well documented and are typically derived from the protocols of the EPA, USDA, FDA or the Army Corps of Engineers.

Following the analytical data you will find the Quality Control (QC) results.

Please note that the detection limits that are listed in the body of the report refer to the Practical Quantitation Limits (PQL's), as opposed to the Method Detection Limits (MDL's).

If you should have any questions pertaining to the data package, please feel free to contact me.

Sincerely,


Aaron W. Young
Laboratory Manager

Project #: 14-05806-000
PO Number: 12-101

BACT = Bacteriological
CONV = Conventionals

MET = Metals
ORG = Organics

NUT=Nutrients
DEM=Demand

MIN=Minerals

Am Test Inc.
 13600 NE 126TH PL
 Suite C
 Kirkland, WA 98034
 (425) 885-1664
 www.amtestlab.com



*Professional
 Analytical
 Services*

ANALYSIS REPORT

On-Site Environmental
 14648 NE 95th ST
 Redmond, WA 98052
 Attention: David Baumeister
 Project #: 14-05806-000
 PO Number: 12-101
 All results reported on an as received basis.

Date Received: 12/11/17
 Date Reported: 1/ 3/18

AMTEST Identification Number 17-A021774
Client Identification COLM-20171211
Sampling Date 12/11/17, 13:20

Microbiological

| PARAMETER | RESULT | UNITS | Q | D.L. | METHOD | ANALYST | DATE / TIME |
|----------------|--------|------------|---|------|----------|---------|----------------|
| Fecal Coliform | 18. | CFU/100 ml | | 2 | SM 9222D | JM | 12/11/17 16:45 |

Nutrients

| PARAMETER | RESULT | UNITS | Q | D.L. | METHOD | ANALYST | DATE |
|--------------------------|--------|-------|---|------|-----------|---------|----------|
| Total Nitrogen (NOX&TKN) | 3.80 | mg/l | | 0.1 | | | |
| Total Nitrogen (TKN) | 1.10 | mg/l | | 0.1 | EPA 351.2 | JC | 12/21/17 |
| Nitrate + Nitrite | 2.7 | mg/l | | 0.01 | EPA 353.2 | JC | 12/13/17 |

On-Site Environmental
Project Name:
AmTest ID: 17-A021775

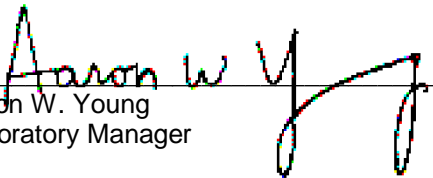
AMTEST Identification Number 17-A021775
Client Identification QA38-20171211
Sampling Date 12/11/17, 12:30

Microbiological

| PARAMETER | RESULT | UNITS | Q | D.L. | METHOD | ANALYST | DATE / TIME |
|----------------|--------|------------|---|------|----------|---------|----------------|
| Fecal Coliform | < 2 | CFU/100 ml | | 2 | SM 9222D | JM | 12/11/17 16:45 |

Nutrients

| PARAMETER | RESULT | UNITS | Q | D.L. | METHOD | ANALYST | DATE |
|--------------------------|--------|-------|---|------|-----------|---------|----------|
| Total Nitrogen (NOX&TKN) | 0.31 | mg/l | | 0.1 | | | |
| Total Nitrogen (TKN) | 0.308 | mg/l | | 0.1 | EPA 351.2 | JC | 12/21/17 |
| Nitrate + Nitrite | < 0.01 | mg/l | | 0.01 | EPA 353.2 | JC | 12/13/17 |


Aaron W. Young
Laboratory Manager

QC Summary for sample numbers: 17-A021774 to 17-A021775

DUPLICATES

| SAMPLE # | ANALYTE | UNITS | SAMPLE VALUE | DUP VALUE | RPD |
|------------|----------------------|------------|--------------|-----------|-----|
| 17-A021775 | Fecal Coliform | CFU/100 ml | < 2 | < 2 | |
| 17-A021444 | Total Nitrogen (TKN) | mg/l | < 0.1 | 0.130 | |
| 17-A021466 | Total Nitrogen (TKN) | mg/l | 0.348 | 0.324 | 7.1 |
| 17-A021474 | Total Nitrogen (TKN) | mg/l | 24.2 | 22.9 | 5.5 |
| 17-A021775 | Total Nitrogen (TKN) | mg/l | 0.308 | 0.354 | 14. |
| 17-A021491 | Nitrate + Nitrite | mg/l | < 0.01 | 0.014 | |
| 17-A021620 | Nitrate + Nitrite | mg/l | 0.39 | 0.41 | 5.0 |

MATRIX SPIKES

| SAMPLE # | ANALYTE | UNITS | SAMPLE VALUE | SMPL+ SPK | SPK AMT | RECOVERY |
|------------|----------------------|-------|--------------|-----------|---------|----------|
| 17-A021444 | Total Nitrogen (TKN) | mg/l | < 0.1 | 2.06 | 2.00 | 103.00 % |
| 17-A021466 | Total Nitrogen (TKN) | mg/l | 0.348 | 2.49 | 2.00 | 107.10 % |
| 17-A021474 | Total Nitrogen (TKN) | mg/l | 24.2 | 43.2 | 20.0 | 95.00 % |
| 17-A021775 | Total Nitrogen (TKN) | mg/l | 0.308 | 2.26 | 2.00 | 97.60 % |
| 17-A021491 | Nitrate + Nitrite | mg/l | < 0.01 | 0.97 | 1.0 | 97.00 % |
| 17-A021620 | Nitrate + Nitrite | mg/l | 0.39 | 1.2 | 1.0 | 81.00 % |

STANDARD REFERENCE MATERIALS

| ANALYTE | UNITS | TRUE VALUE | MEASURED VALUE | RECOVERY |
|----------------------|-------|------------|----------------|----------|
| Total Nitrogen (TKN) | mg/l | 1.00 | 0.966 | 96.6 % |
| Total Nitrogen (TKN) | mg/l | 1.00 | 0.988 | 98.8 % |
| Nitrate + Nitrite | mg/l | 1.0 | 0.93 | 93.0 % |
| Nitrate + Nitrite | mg/l | 1.0 | 0.86 | 86.0 % |

BLANKS

| ANALYTE | UNITS | RESULT |
|----------------------|------------|--------|
| Fecal Coliform | CFU/100 ml | < 1 |
| Total Nitrogen (TKN) | mg/l | < 0.1 |
| Total Nitrogen (TKN) | mg/l | < 0.1 |
| Nitrate + Nitrite | mg/l | < 0.01 |
| Nitrate + Nitrite | mg/l | < 0.01 |



14648 NE 95th Street, Redmond, WA 98052 · (425) 883-3881

Laboratory: AmTest Laboratories

Attention: Aaron Young

13600 NE 126th PI Kirkland, WA 98034

Phone Number: (425) 885-1664

Turnaround Request

1 Day 2 Day 3 Day

Standard

Other: _____

Laboratory Reference #: 12-101

Project Manager: David Baumeister

email: dbaumeister@onsite-env.com

Project Number: 14-05806-000

Project Name: _____

| Lab ID | Sample Identification | Date Sampled | Time Sampled | Matrix | # of Cont. | Requested Analyses |
|--------|-----------------------|--------------|--------------|--------|------------|--------------------------------|
| 21774 | COLM-20171211 | 12/11/17 | 1320 | W | 2 | Fecal Coliform, Total Nitrogen |
| 75 | QA38-20171211 | ↓ | 1230 | ↓ | ↓ | ↓ ↓ |
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| Signature | Company | Date | Time | Comments/Special Instructions |
|------------------|--------------|----------|--------|-------------------------------|
| Relinquished by: | O.S.E | 12/11/17 | 4:24pm | |
| Received by: | AMTEST T=6.5 | 12/11/17 | 4:25 | |
| Relinquished by: | | | | |
| Received by: | | | | |
| Relinquished by: | | | | |
| Received by: | | | | |



CHAIN OF CUSTODY

14648 NE 95th Street, Redmond, WA 98052
Telephone: 425.883.3881

Company: Herrera Environmental Consultants

Project No.: 14-05806-000

Project Name: Redmond Paired Watershed Study

Project Manager: George Ifner

Turnaround Requested:

- 1 Day
- 2 Day
- 3 Day
- Standard

Laboratory No.

12-101

Requested Analyses

| | | | | | | | | | | | | | | |
|-----------------------------------|-----------------------|---------------------------------|-------------------------------------|---------------------------|------------------------------|------------------------------|-----------------------------|-----------------------------------|--|--|--|--|--|--|
| Total Suspended Solids (SM 2540D) | Turbidity (EPA 181.1) | Hardness (EPA 200.7 / SM 2340B) | Dissolved Organ Carbon (SM 5310B) * | Fecal Coliform (SM 9222D) | Total Phosphorus (EPA 365.1) | Total Nitrogen (SM 4500 N-B) | Total Cu and Zn (EPA 200.8) | Dissolved Cu and Zn (EPA 200.8) * | | | | | | |
|-----------------------------------|-----------------------|---------------------------------|-------------------------------------|---------------------------|------------------------------|------------------------------|-----------------------------|-----------------------------------|--|--|--|--|--|--|

| Lab ID | Sample Identification | Date Sampled | Time Sampled | Matrix | # of Cont. | Total Suspended Solids (SM 2540D) | Turbidity (EPA 181.1) | Hardness (EPA 200.7 / SM 2340B) | Dissolved Organ Carbon (SM 5310B) * | Fecal Coliform (SM 9222D) | Total Phosphorus (EPA 365.1) | Total Nitrogen (SM 4500 N-B) | Total Cu and Zn (EPA 200.8) | Dissolved Cu and Zn (EPA 200.8) * |
|--------|-----------------------|--------------|--------------|--------|------------|-----------------------------------|-----------------------|---------------------------------|-------------------------------------|---------------------------|------------------------------|------------------------------|-----------------------------|-----------------------------------|
| 1 | COLM-20171211 | 12.11.17 | 1320 | Water | 7 | X | X | X | X | X | X | X | X | X |
| 2 | QA37-20171211 | 12.11.17 | 1225 | Water | 12 | X | X | X | X | X | X | X | X | X |
| 3 | QA38-20171211 | 12.11.17 | 1230 | Water | 7 | X | X | X | X | X | X | X | X | X |
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Relinquished by Marianne Date 12.11.17 Received by [Signature] Date 12.11.17
 Firm Herrera Time 1405 Firm OSE Time 1405
 Relinquished by _____ Date _____ Received by _____ Date _____

Comments:
 * - field filtered with 0.45 μm filter within 15 minutes of collecting sample



14648 NE 95th Street, Redmond, WA 98052
 Telephone: 425.883.3881

Company: Herrera Environmental Consultants

Project No.: 14-05806-000

Project Name: Redmond Paired Watershed Study

Project Manager: George Ifner

CHAIN OF CUSTODY

Turnaround
Requested:

- 1 Day
- 2 Day
- 3 Day
- Standard

Laboratory No.

12-101

Requested Analyses

| | | | | | | | | | | | | | | |
|-----------------------------------|-----------------------|---------------------------------|-------------------------------------|--------------------------|------------------------------|------------------------------|-----------------------------|-----------------------------------|--|--|--|--|--|--|
| Total Suspended Solids (SM 2540D) | Turbidity (EPA 181.1) | Hardness (EPA 200.7 / SM 2340B) | Dissolved Organ Carbon (SM 5310B) * | Fecal Coliform (SM 922D) | Total Phosphorus (EPA 365.1) | Total Nitrogen (SM 4500 N-B) | Total Cu and Zn (EPA 200.8) | Dissolved Cu and Zn (EPA 200.8) * | | | | | | |
|-----------------------------------|-----------------------|---------------------------------|-------------------------------------|--------------------------|------------------------------|------------------------------|-----------------------------|-----------------------------------|--|--|--|--|--|--|

| Lab ID | Sample Identification | Date Sampled | Time Sampled | Matrix | # of Cont. | Total Suspended Solids (SM 2540D) | Turbidity (EPA 181.1) | Hardness (EPA 200.7 / SM 2340B) | Dissolved Organ Carbon (SM 5310B) * | Fecal Coliform (SM 922D) | Total Phosphorus (EPA 365.1) | Total Nitrogen (SM 4500 N-B) | Total Cu and Zn (EPA 200.8) | Dissolved Cu and Zn (EPA 200.8) * | | | | |
|--------|-----------------------|--------------|--------------|--------|------------|-----------------------------------|-----------------------|---------------------------------|-------------------------------------|--------------------------|------------------------------|------------------------------|-----------------------------|-----------------------------------|--|--|--|--|
| 1 | COLM-2017 211 | 12.11.17 | 1320 | Water | 7 | X | X | X | X | X | X | X | X | X | | | | |
| 2 | QA37 - 2017 211 | ✓ | 1225 | Water | 7 | X | X | X | X | X | X | X | X | X | | | | |
| 3 | QA38 - 2017 211 | ✓ | 1230 | Water | 7 | X | X | X | X | X | X | X | X | X | | | | |
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Relinquished by Miriam Date 12.11.17 Received by [Signature] Date 12.11.17

Firm Herrera Time 1405 Firm OSE Time 1405

Relinquished by _____ Date _____ Received by _____ Date _____

Comments:
 * - field filtered with 0.45 µm filter within 15 minutes of collecting sample

METER CALIBRATION LOG - Redmond Paired Watershed Study

| | | | |
|-----------------------------------|------------------|------------|--|
| Project Number: | 14-05806-000 | | |
| Personnel Performing Calibration: | B. Blaud | | |
| Meter: | YSI 60DS#1 | | |
| Date/Time: | 12-11-17 @ 12:00 | | |
| Barometric Pressure Start of Day: | mmHg: 707.2 | Time: 1200 | |
| Barometric Pressure End of Day: | mmHg: 708.4 | Time: 1530 | |

| |
|---|
| Calibration Procedures: |
| Rinse Multimeter Sonde Between Each Operation |
| Rinse 3 times with tap water, 3 times with deionized water, then 3 times with the solution to be used for calibrating or testing. |
| Conductivity Calibration Notes: |



| PRE Field Run CALIBRATION | Meter Reading | Buffer / Cal Std | Temp °C | Comments |
|---------------------------|---------------|------------------|---------|--------------------|
| Conductivity (µS/cm) | 5.0 | 0 | 22.1 | |
| Conductivity (µS/cm) | 1004 | 1,000 | 21.8 | calibrated to 1000 |
| Conductivity (µS/cm) | 100.7 | 100 | 23.0 | |
| DO % Saturation | 99.5 | 100 | 22.2 | calibrated to 100% |

| POST Field Run CHECK | Meter Reading | Buffer / Cal Std | Temp °C | Comments |
|----------------------|---------------|------------------|---------|----------|
| Conductivity (µS/cm) | 10.7 | 0 | 22.3 | |
| Conductivity (µS/cm) | 100.4 | 100 | 21.0 | |
| DO % Saturation | 99.8 | 100 | 21.8 | |

1. Dry the conductivity probe with a lab tissue (e.g., KimWipes®) and DI water.
2. Fill calibration cup to within a centimeter of the top of the calibration cup with DI water (0 µS).
3. Fill the calibration cup with 1,000 µS standard so that the temperature/conductivity probe is submerged.
4. Make sure there are no bubbles in the cell; wait 2 minutes.
5. Enter the appropriate standard value (1,000 µS/cm or 1.0 mS/cm) for Sp Cond.
6. Check conductivity using 100 µS/cm standard.

- Dissolved Oxygen Calibration Notes:**
1. Fill the calibration cup with about 1/2 inch of DI; it should be below the sensor cap.
 2. Use KimWipes® to dry any droplets from the sensor cap.
 3. Invert calibration cup's cap and gently rest it on the cup.
 4. Wait 5 minutes, making sure that temperature stabilizes.
 5. Determine local barometric pressure (mm Hg) and enter this value into the meter.
 6. Click "Calibrate". "Calibrate Successful" will be displayed.
 7. To retain calibration accuracy between measurements, store with the sensor immersed in water or within a water-saturated air environment such as a sealed storage cup with at least 10 ml of water.
 8. It is important to have the water-saturated air and the sensor at the same temperature. Therefore, store a jar of DI in the same environment as the sonde and calibrate in a similar air temperature as the water and sonde.
 9. Keep probe out of direct sun or wind.

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: MB
 Sample Date: 12-11-17 Sample Time: 1320 PDT
 Base Flow or Storm Event? Field Filtered Time: 1325 PST
(Must filter within 15 minutes of collection)

SITE ID: COLM
 Project Number: 14-05806-000



Project Name: Redmond Paired Watershed Study
 Current Weather and Temp: SUNNY 8 43°F

Water Quality Sampling

Sample ID: COLM-20171211

| Parameter | Bottle Type | Bottle Volume | # Bottles | Preservative | Duplicated? |
|---------------------------|-------------|---------------|-----------|--------------------------------|-------------------------------------|
| TSS and Turbidity | HDPE | 1L | 1 | NA | <input checked="" type="checkbox"/> |
| DOC * | HDPE | 250 ml | 1 | HCL | <input checked="" type="checkbox"/> |
| Fecal Col. Bact. | HDPE | 250 ml | 1 | EDTA | <input checked="" type="checkbox"/> |
| T. Phosphorous | HDPE | 250 ml | 1 | H ₂ SO ₄ | <input checked="" type="checkbox"/> |
| T. Nitrogen | HDPE | 250 ml | 1 | H ₂ SO ₄ | <input checked="" type="checkbox"/> |
| Diss. Cu and Zn * | HDPE | 250 ml | 1 | HNO ₃ | <input checked="" type="checkbox"/> |
| Hardness, Total Cu and Zn | HDPE | 500 ml | 1 | HNO ₃ | <input checked="" type="checkbox"/> |

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID: NA
 Filter blank sample ID: QA37-20171211
 Transfer blank sample ID: QA38-20171211

Visual and Olfactory Conditions:

Clarity: clear
 Color: yellow
 Odor: none
 Sheen:
 Floatables:

LABORATORY DELIVERY

Date: _____ Time: _____

Quality Assurance

Checked By: John Lenth Signature: _____
 Date Checked: 2-16-18 Time: _____
 Data Entered into Database? YES NO initials: _____
 Date Entered: _____ Time: _____
 Notes: _____

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

YSI Pro Plus (15D100020) _____
 YSI Pro DSS 1 _____
 YSI Pro DSS 2 _____

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): 5.01
 Reference Point (description): SG

Water Quality Measurements

Temperature (°C) 2.9
 Specific Conductivity (µs/cm) 31.0
 Dissolved Oxygen (mg/L) 12.34



HERRERA

Data Quality Assurance Worksheet

Project Name/No./Client: Redmond Paired Watershed Study / 14-05806-000 / City of Redmond

Laboratory/Parameters: OnSite Environmental : TSS, turbidity, hardness, DOC, TP, Dissolved & Total Cu, Zn / AmTest: Total nitrogen, fecal coliform bacteria

Sample Date/Sample ID: 12/11/2017 / COLM only and QC samples: 1 FB (QA37) and 1 TB (QA38)

By G. Catarra

Date 1/9/2018 Page 1 of 2

Checked: initials JL

date 2/6/2018

| Parameter | Completeness/ Methodology | Pre-preservation Holding Times (minutes) | | Total Holding Times (days) | | Method Blanks Reporting Limit | Matrix Spikes/ Surrogate Recovery (%) | | Lab Control Samples Recovery (%) | | Lab Duplicates RPD (%) | | Field Duplicates RPD (%) | | Instrument Calibration/ Performance | ACTION |
|-------------------------------------|------------------------------|--|------|-------------------------------|------|--|---|-------------------|--|-------------------|---------------------------|-------------------|-----------------------------|-------------------|---|--|
| | | Reported | Goal | Reported | Goal | | Reported | Goal ¹ | Reported | Goal ¹ | Reported | Goal ¹ | Reported | Goal ¹ | | |
| TSS | OK / SM 2540D | NA | NA | 3 | ≤7 | ≤1.0 mg/L 1.0 mg/L | NA | NA | 91 | ±20 | NC | ≤25 | NS | ≤25 | OK | TB=ND |
| Turbidity | OK / EPA 180.1 | NA | NA | 2 | ≤2 | ≤0.1 NTU 0.1 NTU | NA | NA | NA | ±10 | 2 | ≤25 | NS | ≤25 | OK | TB=0.14, COLM <5X TB RESULT, "J" COLM RESULT |
| Hardness | OK / SM 2340B | NA | NA | 3 | ≤180 | ≤1.0 mg/L 1.0 mg/L | 95,102 | ±25 | 96 | ±15 | 0 | ≤20 | NS | ≤20 | OK | TB=ND |
| DOC | OK / SM 5310B | <15 | ≤15 | 2 | ≤28 | ≤1.0 mg/L 1.0 mg/L | 91 | ±25 | 100 | ±15 | 2 | ≤20 | NS | ≤20 | OK | TB=ND FB=ND |
| Total Phosphorus | OK / EPA 365.1 | NA | NA | 7 | ≤28 | ≤0.01 mg/L 0.01 mg/L | 100 | ±25 | 96 | ±20 | 1 | ≤20 | NS | ≤20 | OK | TB=ND |
| Total Nitrogen (TKN + N+N) | OK/ SM 4500 N-B | NA | NA | 2,11 | ≤28 | ≤0.1 mg/L 0.1 mg/L | 98 | ±25 | 86-99 | ±20 | 14 | ≤20 | NS | ≤20 | OK | TB=0.31 (TKN), "J" TKN (1.10) AND TN (3.80) RESULTS. |

¹ If the sample or duplicate value is less than five times the reporting limit, the difference is calculated rather than the relative percent difference (RPD). The QA goal is a difference <2 times the detection limit instead of the number indicated in the goal column.

NA – not applicable or not available; NC – not calculable due to one or more values below the detection limit; NS – field duplicate not sampled.



Data Quality Assurance Worksheet

By G. Catarra

Project Name/No./Client: Redmond Paired Watershed Study / 14-05806-000 / City of Redmond

Date 1/09/2017 Page 2 of 2

Laboratory/Parameters: OnSite Environmental : TSS, turbidity, hardness, DOC, TP, Dissolved & Total Cu, Zn / AmTest: total nitrogen, fecal coliform bacteria

Checked: initials
JL

Sample Date/Sample ID: 12/11/2017 / COLM only and QC samples: 1 FB (QA37) and 1 TB (QA38)

date 2/6/2018

| Parameter | Completeness/ Methodology | Pre-preservation Holding Times (minutes) | | Total Holding Times (days) | | Method Blanks Reporting Limit | Matrix Spikes/ Surrogate Recovery (%) | | Lab Control Samples Recovery (%) | | Lab Duplicates RPD (%) | | Field Duplicates RPD (%) | | Instrument Calibration/ Performance | ACTION |
|------------------|------------------------------|--|------|-------------------------------|------|--|---|-------------------|--|------|---------------------------|-------------------|-----------------------------|-------------------|---|---|
| | | Reported | Goal | Reported | Goal | | Reported | Goal ¹ | Reported | Goal | Reported | Goal ¹ | Reported | Goal ¹ | | |
| Total Copper | OK/ EPA 200.8 | NA | NA | 2 | ≤180 | ≤1.0 µg/L 1.0 µg/L | 98,105 | ±25 | NR | ±15 | NC | ≤20 | NS | ≤20 | OK | TB=5.8, SAMPLE = 1.2, FLAG "J" |
| Total Zinc | OK/ EPA 200.8 | NA | NA | 2 | ≤180 | ≤5.0 µg/L 5.0 µg/L | 108,116 | ±25 | NR | ±15 | NC | ≤20 | NS | ≤20 | OK | TB=ND |
| Dissolved Copper | OK/ EPA 200.8 | <15 | ≤15 | 2 | ≤180 | ≤1.0 µg/L 1.0 µg/L | 105,105 | ±25 | NR | ±15 | 21 | ≤20 | NS | ≤20 | OK | FB=4.1, TB = 5.5. FLAG SAMPLE "J" (1.9) |
| Dissolved Zinc | OK/ EPA 200.8 | <15 | ≤15 | 2 | ≤180 | ≤5.0 µg/L 5.0 µg/L | 117,116 | ±25 | NR | ±15 | 2 | ≤20 | NS | ≤20 | OK | TB=ND, FB=ND |
| Fecal Coliform | OK/ SM 9222D | NA | NA | <1 | ≤1 | ≤1.0 cfu/ 100mL 10 cfu/ 100mL | NA | NA | NA | NA | NC | ≤35 | NS | ≤50 | OK | TB=ND |

¹ If the sample or duplicate value is less than five times the reporting limit, the difference is calculated rather than the relative percent difference (RPD). The QA goal is a difference <2 times the detection limit instead of the number indicated in the goal column.

NA – not applicable or not available; NC – not calculable due to one or more values below the detection limit; NS – field duplicate not sampled.



14648 NE 95th Street, Redmond, WA 98052 • (425) 883-3881

January 3, 2018

George Iftner
Herrera Environmental Consultants, Inc.
2200 6th Avenue, Suite 1100
Seattle, WA 98121

Re: Analytical Data for Project 14-05806-000
Laboratory Reference No. 1712-194

Dear George:

Enclosed are the analytical results and associated quality control data for samples submitted on December 19, 2017.

The standard policy of OnSite Environmental, Inc. is to store your samples for 30 days from the date of receipt. If you require longer storage, please contact the laboratory.

We appreciate the opportunity to be of service to you on this project. If you have any questions concerning the data, or need additional information, please feel free to call me.

Sincerely,

A handwritten signature in black ink, appearing to read "Blair Goodrow", enclosed within a large, loopy circular flourish.

Blair Goodrow
Project Manager

Enclosures



OnSite Environmental, Inc. 14648 NE 95th Street, Redmond, WA 98052 (425) 883-3881

This report pertains to the samples analyzed in accordance with the chain of custody, and is intended only for the use of the individual or company to whom it is addressed.

Date of Report: January 3, 2018
Samples Submitted: December 19, 2017
Laboratory Reference: 1712-194
Project: 14-05806-000

Case Narrative

Samples were collected on December 19, 2017 and received by the laboratory on December 19, 2017. They were maintained at the laboratory at a temperature of 2°C to 6°C.

Please note that any and all soil sample results are reported on a dry-weight basis, unless otherwise noted below.

General QA/QC issues associated with the analytical data enclosed in this laboratory report will be indicated with a reference to a comment or explanation on the Data Qualifier page. More complex and involved QA/QC issues will be discussed in detail below.



Date of Report: January 3, 2018
 Samples Submitted: December 19, 2017
 Laboratory Reference: 1712-194
 Project: 14-05806-000

**TOTAL SUSPENDED SOLIDS
SM 2540D**

Matrix: Water
 Units: mg/L

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|------------------------|----------------------|-----|----------|---------------|---------------|-------|
| Client ID: | COLM-20171219 | | | | | |
| Laboratory ID: | 12-194-01 | | | | | |
| Total Suspended Solids | 6.2 | 1.0 | SM 2540D | 12-20-17 | 12-21-17 | |

| | | | | | | |
|------------------------|-----------------------|-----|----------|----------|----------|--|
| Client ID: | COUMI-20171219 | | | | | |
| Laboratory ID: | 12-194-02 | | | | | |
| Total Suspended Solids | 98 | 2.0 | SM 2540D | 12-20-17 | 12-21-17 | |

| | | | | | | |
|------------------------|-----------------------|-----|----------|----------|----------|--|
| Client ID: | COUMO-20171219 | | | | | |
| Laboratory ID: | 12-194-03 | | | | | |
| Total Suspended Solids | 80 | 2.0 | SM 2540D | 12-20-17 | 12-21-17 | |

| | | | | | | |
|------------------------|-----------------------|-----|----------|----------|----------|--|
| Client ID: | EVAMS-20171219 | | | | | |
| Laboratory ID: | 12-194-04 | | | | | |
| Total Suspended Solids | 40 | 1.0 | SM 2540D | 12-20-17 | 12-21-17 | |

| | | | | | | |
|------------------------|------------------------|-----|----------|----------|----------|--|
| Client ID: | EVALSS-20171219 | | | | | |
| Laboratory ID: | 12-194-05 | | | | | |
| Total Suspended Solids | 130 | 2.0 | SM 2540D | 12-20-17 | 12-21-17 | |

| | | | | | | |
|------------------------|-----------------------|-----|----------|----------|----------|--|
| Client ID: | MONMN-20171219 | | | | | |
| Laboratory ID: | 12-194-06 | | | | | |
| Total Suspended Solids | 56 | 1.0 | SM 2540D | 12-20-17 | 12-21-17 | |

| | | | | | | |
|------------------------|-----------------------|-----|----------|----------|----------|--|
| Client ID: | MONMS-20171219 | | | | | |
| Laboratory ID: | 12-194-07 | | | | | |
| Total Suspended Solids | 27 | 1.0 | SM 2540D | 12-20-17 | 12-21-17 | |



Date of Report: January 3, 2018
 Samples Submitted: December 19, 2017
 Laboratory Reference: 1712-194
 Project: 14-05806-000

**TOTAL SUSPENDED SOLIDS
SM 2540D**

Matrix: Water
 Units: mg/L

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|------------------------|----------------------|-----|----------|---------------|---------------|-------|
| Client ID: | MONM-20171219 | | | | | |
| Laboratory ID: | 12-194-08 | | | | | |
| Total Suspended Solids | 42 | 1.0 | SM 2540D | 12-20-17 | 12-21-17 | |

| | | | | | | |
|------------------------|-----------------------|-----|----------|----------|----------|--|
| Client ID: | SEIMN-20171219 | | | | | |
| Laboratory ID: | 12-194-09 | | | | | |
| Total Suspended Solids | 180 | 2.0 | SM 2540D | 12-20-17 | 12-21-17 | |

| | | | | | | |
|------------------------|-----------------------|-----|----------|----------|----------|--|
| Client ID: | SEIMS-20171219 | | | | | |
| Laboratory ID: | 12-194-10 | | | | | |
| Total Suspended Solids | 32 | 1.0 | SM 2540D | 12-20-17 | 12-21-17 | |

| | | | | | | |
|------------------------|-----------------------|-----|----------|----------|----------|--|
| Client ID: | TOSMI-20171219 | | | | | |
| Laboratory ID: | 12-194-11 | | | | | |
| Total Suspended Solids | 610 | 2.0 | SM 2540D | 12-20-17 | 12-21-17 | |

| | | | | | | |
|------------------------|-----------------------|-----|----------|----------|----------|--|
| Client ID: | TOSMO-20171219 | | | | | |
| Laboratory ID: | 12-194-12 | | | | | |
| Total Suspended Solids | 230 | 2.0 | SM 2540D | 12-20-17 | 12-21-17 | |

| | | | | | | |
|------------------------|-----------------------|-----|----------|----------|----------|--|
| Client ID: | TYLMI-20171219 | | | | | |
| Laboratory ID: | 12-194-13 | | | | | |
| Total Suspended Solids | 68 | 2.0 | SM 2540D | 12-20-17 | 12-21-17 | |

| | | | | | | |
|------------------------|-----------------------|-----|----------|----------|----------|--|
| Client ID: | TYLMO-20171219 | | | | | |
| Laboratory ID: | 12-194-14 | | | | | |
| Total Suspended Solids | 50 | 1.0 | SM 2540D | 12-20-17 | 12-21-17 | |



Date of Report: January 3, 2018
Samples Submitted: December 19, 2017
Laboratory Reference: 1712-194
Project: 14-05806-000

TOTAL SUSPENDED SOLIDS
SM 2540D

Matrix: Water
Units: mg/L

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|------------------------|----------------------|------------|---------------|----------------------|----------------------|--------------|
| Client ID: | QA39-20171219 | | | | | |
| Laboratory ID: | 12-194-15 | | | | | |
| Total Suspended Solids | 36 | 2.0 | SM 2540D | 12-20-17 | 12-21-17 | |



Date of Report: January 3, 2018
 Samples Submitted: December 19, 2017
 Laboratory Reference: 1712-194
 Project: 14-05806-000

**TOTAL SUSPENDED SOLIDS
 SM 2540D
 QUALITY CONTROL**

Matrix: Water
 Units: mg/L

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|------------------------|-----------|-----|----------|---------------|---------------|-------|
| METHOD BLANK | | | | | | |
| Laboratory ID: | MB1220W1 | | | | | |
| Total Suspended Solids | ND | 1.0 | SM 2540D | 12-20-17 | 12-21-17 | |

| Analyte | Result | Spike Level | Source Result | Percent Recovery | Recovery Limits | RPD | RPD Limit | Flags |
|------------------------|-------------|-------------|---------------|------------------|-----------------|-----|-----------|-------|
| DUPLICATE | | | | | | | | |
| Laboratory ID: | 12-194-14 | | | | | | | |
| | ORIG | DUP | | | | | | |
| Total Suspended Solids | 49.8 | 58.0 | NA | NA | NA | NA | 15 | 17 |

| | | | | | | | | |
|------------------------|-------------|-----|----|----|--------|----|----|--|
| SPIKE BLANK | | | | | | | | |
| Laboratory ID: | SB1220W1 | | | | | | | |
| | SB | SB | | SB | | | | |
| Total Suspended Solids | 89.0 | 100 | NA | 89 | 76-114 | NA | NA | |



Date of Report: January 3, 2018
 Samples Submitted: December 19, 2017
 Laboratory Reference: 1712-194
 Project: 14-05806-000

TURBIDITY
EPA 180.1

Matrix: Water
 Units: NTU

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|-------------------|----------------------|------|-----------|---------------|---------------|-------|
| Client ID: | COLM-20171219 | | | | | |
| Laboratory ID: | 12-194-01 | | | | | |
| Turbidity | 1.3 | 0.10 | EPA 180.1 | 12-20-17 | 12-20-17 | |

| | | | | | | |
|-------------------|-----------------------|------|-----------|----------|----------|--|
| Client ID: | COUMI-20171219 | | | | | |
| Laboratory ID: | 12-194-02 | | | | | |
| Turbidity | 32 | 0.10 | EPA 180.1 | 12-20-17 | 12-20-17 | |

| | | | | | | |
|-------------------|-----------------------|------|-----------|----------|----------|--|
| Client ID: | COUMO-20171219 | | | | | |
| Laboratory ID: | 12-194-03 | | | | | |
| Turbidity | 19 | 0.10 | EPA 180.1 | 12-20-17 | 12-20-17 | |

| | | | | | | |
|-------------------|-----------------------|------|-----------|----------|----------|--|
| Client ID: | EVAMS-20171219 | | | | | |
| Laboratory ID: | 12-194-04 | | | | | |
| Turbidity | 14 | 0.10 | EPA 180.1 | 12-20-17 | 12-20-17 | |

| | | | | | | |
|-------------------|------------------------|------|-----------|----------|----------|--|
| Client ID: | EVALSS-20171219 | | | | | |
| Laboratory ID: | 12-194-05 | | | | | |
| Turbidity | 39 | 0.10 | EPA 180.1 | 12-20-17 | 12-20-17 | |

| | | | | | | |
|-------------------|-----------------------|------|-----------|----------|----------|--|
| Client ID: | MONMN-20171219 | | | | | |
| Laboratory ID: | 12-194-06 | | | | | |
| Turbidity | 21 | 0.10 | EPA 180.1 | 12-20-17 | 12-20-17 | |

| | | | | | | |
|-------------------|-----------------------|------|-----------|----------|----------|--|
| Client ID: | MONMS-20171219 | | | | | |
| Laboratory ID: | 12-194-07 | | | | | |
| Turbidity | 8.3 | 0.10 | EPA 180.1 | 12-20-17 | 12-20-17 | |



Date of Report: January 3, 2018
 Samples Submitted: December 19, 2017
 Laboratory Reference: 1712-194
 Project: 14-05806-000

TURBIDITY
EPA 180.1

Matrix: Water
 Units: NTU

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|-------------------|----------------------|------|-----------|---------------|---------------|-------|
| Client ID: | MONM-20171219 | | | | | |
| Laboratory ID: | 12-194-08 | | | | | |
| Turbidity | 18 | 0.10 | EPA 180.1 | 12-20-17 | 12-20-17 | |

| | | | | | | |
|-------------------|-----------------------|------|-----------|----------|----------|--|
| Client ID: | SEIMN-20171219 | | | | | |
| Laboratory ID: | 12-194-09 | | | | | |
| Turbidity | 49 | 0.10 | EPA 180.1 | 12-20-17 | 12-20-17 | |

| | | | | | | |
|-------------------|-----------------------|------|-----------|----------|----------|--|
| Client ID: | SEIMS-20171219 | | | | | |
| Laboratory ID: | 12-194-10 | | | | | |
| Turbidity | 9.4 | 0.10 | EPA 180.1 | 12-20-17 | 12-20-17 | |

| | | | | | | |
|-------------------|-----------------------|------|-----------|----------|----------|--|
| Client ID: | TOSMI-20171219 | | | | | |
| Laboratory ID: | 12-194-11 | | | | | |
| Turbidity | 73 | 0.10 | EPA 180.1 | 12-20-17 | 12-20-17 | |

| | | | | | | |
|-------------------|-----------------------|------|-----------|----------|----------|--|
| Client ID: | TOSMO-20171219 | | | | | |
| Laboratory ID: | 12-194-12 | | | | | |
| Turbidity | 47 | 0.10 | EPA 180.1 | 12-20-17 | 12-20-17 | |

| | | | | | | |
|-------------------|-----------------------|------|-----------|----------|----------|--|
| Client ID: | TYLMI-20171219 | | | | | |
| Laboratory ID: | 12-194-13 | | | | | |
| Turbidity | 14 | 0.10 | EPA 180.1 | 12-20-17 | 12-20-17 | |

| | | | | | | |
|-------------------|-----------------------|------|-----------|----------|----------|--|
| Client ID: | TYLMO-20171219 | | | | | |
| Laboratory ID: | 12-194-14 | | | | | |
| Turbidity | 15 | 0.10 | EPA 180.1 | 12-20-17 | 12-20-17 | |



Date of Report: January 3, 2018
Samples Submitted: December 19, 2017
Laboratory Reference: 1712-194
Project: 14-05806-000

TURBIDITY
EPA 180.1

Matrix: Water
Units: NTU

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|-------------------|----------------------|------------|---------------|----------------------|----------------------|--------------|
| Client ID: | QA39-20171219 | | | | | |
| Laboratory ID: | 12-194-15 | | | | | |
| Turbidity | 7.3 | 0.10 | EPA 180.1 | 12-20-17 | 12-20-17 | |



Date of Report: January 3, 2018
 Samples Submitted: December 19, 2017
 Laboratory Reference: 1712-194
 Project: 14-05806-000

**TURBIDITY
 EPA 180.1
 QUALITY CONTROL**

Matrix: Water
 Units: NTU

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|---------------------|-----------|------|-----------|---------------|---------------|-------|
| METHOD BLANK | | | | | | |
| Laboratory ID: | MB1220W1 | | | | | |
| Turbidity | ND | 0.10 | EPA 180.1 | 12-20-17 | 12-20-17 | |

| Analyte | Result | Spike Level | Source Result | Percent Recovery | Recovery Limits | RPD | RPD Limit | Flags |
|------------------|-------------|-------------|---------------|------------------|-----------------|-----|-----------|-------|
| DUPLICATE | | | | | | | | |
| Laboratory ID: | 12-194-01 | | | | | | | |
| | ORIG | DUP | | | | | | |
| Turbidity | 1.26 | 1.27 | NA | NA | NA | NA | 1 | 15 |



Date of Report: January 3, 2018
 Samples Submitted: December 19, 2017
 Laboratory Reference: 1712-194
 Project: 14-05806-000

HARDNESS
EPA 200.7/SM 2340B

Matrix: Water
 Units: mg eqt. CaCO₃/L (ppm)

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|-------------------|----------------------|-----|----------------|---------------|---------------|-------|
| Client ID: | COLM-20171219 | | | | | |
| Laboratory ID: | 12-194-01 | | | | | |
| Hardness | 9.2 | 1.0 | 200.7/SM 2340B | 12-21-17 | 12-21-17 | |

| | | | | | | |
|-------------------|-----------------------|-----|----------------|----------|----------|--|
| Client ID: | COUMI-20171219 | | | | | |
| Laboratory ID: | 12-194-02 | | | | | |
| Hardness | 55 | 1.0 | 200.7/SM 2340B | 12-21-17 | 12-21-17 | |

| | | | | | | |
|-------------------|-----------------------|-----|----------------|----------|----------|--|
| Client ID: | COUMO-20171219 | | | | | |
| Laboratory ID: | 12-194-03 | | | | | |
| Hardness | 40 | 1.0 | 200.7/SM 2340B | 12-21-17 | 12-21-17 | |

| | | | | | | |
|-------------------|-----------------------|-----|----------------|----------|----------|--|
| Client ID: | EVAMS-20171219 | | | | | |
| Laboratory ID: | 12-194-04 | | | | | |
| Hardness | 55 | 1.0 | 200.7/SM 2340B | 12-21-17 | 12-21-17 | |

| | | | | | | |
|-------------------|------------------------|-----|----------------|----------|----------|--|
| Client ID: | EVALSS-20171219 | | | | | |
| Laboratory ID: | 12-194-05 | | | | | |
| Hardness | 54 | 1.0 | 200.7/SM 2340B | 12-21-17 | 12-21-17 | |

| | | | | | | |
|-------------------|-----------------------|-----|----------------|----------|----------|--|
| Client ID: | MONMN-20171219 | | | | | |
| Laboratory ID: | 12-194-06 | | | | | |
| Hardness | 32 | 1.0 | 200.7/SM 2340B | 12-21-17 | 12-21-17 | |

| | | | | | | |
|-------------------|-----------------------|-----|----------------|----------|----------|--|
| Client ID: | MONMS-20171219 | | | | | |
| Laboratory ID: | 12-194-07 | | | | | |
| Hardness | 48 | 1.0 | 200.7/SM 2340B | 12-21-17 | 12-21-17 | |



Date of Report: January 3, 2018
 Samples Submitted: December 19, 2017
 Laboratory Reference: 1712-194
 Project: 14-05806-000

HARDNESS
EPA 200.7/SM 2340B

Matrix: Water
 Units: mg eqt. CaCO₃/L (ppm)

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|-------------------|----------------------|-----|----------------|---------------|---------------|-------|
| Client ID: | MONM-20171219 | | | | | |
| Laboratory ID: | 12-194-08 | | | | | |
| Hardness | 37 | 1.0 | 200.7/SM 2340B | 12-21-17 | 12-21-17 | |

| | | | | | | |
|-------------------|-----------------------|-----|----------------|----------|----------|--|
| Client ID: | SEIMN-20171219 | | | | | |
| Laboratory ID: | 12-194-09 | | | | | |
| Hardness | 23 | 1.0 | 200.7/SM 2340B | 12-21-17 | 12-21-17 | |

| | | | | | | |
|-------------------|-----------------------|-----|----------------|----------|----------|--|
| Client ID: | SEIMS-20171219 | | | | | |
| Laboratory ID: | 12-194-10 | | | | | |
| Hardness | 28 | 1.0 | 200.7/SM 2340B | 12-21-17 | 12-21-17 | |

| | | | | | | |
|-------------------|-----------------------|-----|----------------|----------|----------|--|
| Client ID: | TOSMI-20171219 | | | | | |
| Laboratory ID: | 12-194-11 | | | | | |
| Hardness | 39 | 1.0 | 200.7/SM 2340B | 12-21-17 | 12-21-17 | |

| | | | | | | |
|-------------------|-----------------------|-----|----------------|----------|----------|--|
| Client ID: | TOSMO-20171219 | | | | | |
| Laboratory ID: | 12-194-12 | | | | | |
| Hardness | 41 | 1.0 | 200.7/SM 2340B | 12-21-17 | 12-21-17 | |

| | | | | | | |
|-------------------|-----------------------|-----|----------------|----------|----------|--|
| Client ID: | TYLMI-20171219 | | | | | |
| Laboratory ID: | 12-194-13 | | | | | |
| Hardness | 34 | 1.0 | 200.7/SM 2340B | 12-21-17 | 12-21-17 | |

| | | | | | | |
|-------------------|-----------------------|-----|----------------|----------|----------|--|
| Client ID: | TYLMO-20171219 | | | | | |
| Laboratory ID: | 12-194-14 | | | | | |
| Hardness | 26 | 1.0 | 200.7/SM 2340B | 12-21-17 | 12-21-17 | |



Date of Report: January 3, 2018
Samples Submitted: December 19, 2017
Laboratory Reference: 1712-194
Project: 14-05806-000

HARDNESS
EPA 200.7/SM 2340B

Matrix: Water
Units: mg eqt. CaCO₃/L (ppm)

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|-------------------|----------------------|------------|----------------|----------------------|----------------------|--------------|
| Client ID: | QA39-20171219 | | | | | |
| Laboratory ID: | 12-194-15 | | | | | |
| Hardness | 51 | 1.0 | 200.7/SM 2340B | 12-21-17 | 12-21-17 | |



Date of Report: January 3, 2018
 Samples Submitted: December 19, 2017
 Laboratory Reference: 1712-194
 Project: 14-05806-000

HARDNESS
EPA 200.7/SM 2340B
QUALITY CONTROL

Matrix: Water
 Units: mg eqt. CaCO₃/L (ppm)

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|---------------------|-----------|-----|----------------|---------------|---------------|-------|
| METHOD BLANK | | | | | | |
| Laboratory ID: | MB1221WH1 | | | | | |
| Hardness | ND | 1.0 | 200.7/SM 2340B | 12-21-17 | 12-21-17 | |

| Analyte | Result | Spike Level | Source Result | Percent Recovery | Recovery Limits | RPD | RPD Limit | Flags |
|------------------|------------|-------------|---------------|------------------|-----------------|-----|-----------|-------|
| DUPLICATE | | | | | | | | |
| Laboratory ID: | 12-113-01 | | | | | | | |
| | ORIG | DUP | | | | | | |
| Hardness | 108 | 109 | NA | NA | NA | NA | 1 | 20 |

| Analyte | Result | Spike Level | Source Result | Percent Recovery | Recovery Limits | RPD | RPD Limit | Flags | | |
|----------------------|------------|-------------|---------------|------------------|-----------------|-----|-----------|--------|---|----|
| MATRIX SPIKES | | | | | | | | | | |
| Laboratory ID: | 12-113-01 | | | | | | | | | |
| | MS | MSD | MS | MSD | MS | MSD | | | | |
| Hardness | 250 | 245 | 132 | 132 | 108 | 108 | 104 | 75-125 | 2 | 20 |

| Analyte | Result | Spike Level | Source Result | Percent Recovery | Recovery Limits | RPD | RPD Limit | Flags |
|--------------------|------------|-------------|---------------|------------------|-----------------|-----|-----------|-------|
| SPIKE BLANK | | | | | | | | |
| Laboratory ID: | SB1221WH1 | | | | | | | |
| | SB | SB | | | SB | | | |
| Hardness | 127 | 132 | NA | 96 | 80-120 | NA | NA | |



Date of Report: January 3, 2018
 Samples Submitted: December 19, 2017
 Laboratory Reference: 1712-194
 Project: 14-05806-000

**DISSOLVED ORGANIC CARBON
SM 5310B**

Matrix: Water
 Units: mg/L

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|--------------------------|----------------------|-----|----------|---------------|---------------|-------|
| Client ID: | COLM-20171219 | | | | | |
| Laboratory ID: | 12-194-01 | | | | | |
| Dissolved Organic Carbon | 13 | 1.0 | SM 5310B | 12-28-17 | 12-28-17 | |

| | | | | | | |
|--------------------------|-----------------------|-----|----------|----------|----------|--|
| Client ID: | COUMI-20171219 | | | | | |
| Laboratory ID: | 12-194-02 | | | | | |
| Dissolved Organic Carbon | 8.4 | 1.0 | SM 5310B | 12-28-17 | 12-28-17 | |

| | | | | | | |
|--------------------------|-----------------------|-----|----------|----------|----------|--|
| Client ID: | COUMO-20171219 | | | | | |
| Laboratory ID: | 12-194-03 | | | | | |
| Dissolved Organic Carbon | 6.3 | 1.0 | SM 5310B | 12-28-17 | 12-28-17 | |

| | | | | | | |
|--------------------------|-----------------------|-----|----------|----------|----------|--|
| Client ID: | EVAMS-20171219 | | | | | |
| Laboratory ID: | 12-194-04 | | | | | |
| Dissolved Organic Carbon | 12 | 1.0 | SM 5310B | 12-28-17 | 12-28-17 | |

| | | | | | | |
|--------------------------|------------------------|-----|----------|----------|----------|--|
| Client ID: | EVALSS-20171219 | | | | | |
| Laboratory ID: | 12-194-05 | | | | | |
| Dissolved Organic Carbon | 13 | 1.0 | SM 5310B | 12-28-17 | 12-28-17 | |

| | | | | | | |
|--------------------------|-----------------------|-----|----------|----------|----------|--|
| Client ID: | MONMN-20171219 | | | | | |
| Laboratory ID: | 12-194-06 | | | | | |
| Dissolved Organic Carbon | 6.6 | 1.0 | SM 5310B | 12-28-17 | 12-28-17 | |

| | | | | | | |
|--------------------------|-----------------------|-----|----------|----------|----------|--|
| Client ID: | MONMS-20171219 | | | | | |
| Laboratory ID: | 12-194-07 | | | | | |
| Dissolved Organic Carbon | 8.1 | 1.0 | SM 5310B | 12-28-17 | 12-28-17 | |



Date of Report: January 3, 2018
 Samples Submitted: December 19, 2017
 Laboratory Reference: 1712-194
 Project: 14-05806-000

**DISSOLVED ORGANIC CARBON
SM 5310B**

Matrix: Water
 Units: mg/L

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|--------------------------|----------------------|-----|----------|---------------|---------------|-------|
| Client ID: | MONM-20171219 | | | | | |
| Laboratory ID: | 12-194-08 | | | | | |
| Dissolved Organic Carbon | 7.0 | 1.0 | SM 5310B | 12-28-17 | 12-28-17 | |

| | | | | | | |
|--------------------------|-----------------------|-----|----------|----------|----------|--|
| Client ID: | SEIMN-20171219 | | | | | |
| Laboratory ID: | 12-194-09 | | | | | |
| Dissolved Organic Carbon | 12 | 1.0 | SM 5310B | 12-28-17 | 12-28-17 | |

| | | | | | | |
|--------------------------|-----------------------|-----|----------|----------|----------|--|
| Client ID: | SEIMS-20171219 | | | | | |
| Laboratory ID: | 12-194-10 | | | | | |
| Dissolved Organic Carbon | 13 | 1.0 | SM 5310B | 12-28-17 | 12-28-17 | |

| | | | | | | |
|--------------------------|-----------------------|-----|----------|----------|----------|--|
| Client ID: | TOSMI-20171219 | | | | | |
| Laboratory ID: | 12-194-11 | | | | | |
| Dissolved Organic Carbon | 5.2 | 1.0 | SM 5310B | 12-28-17 | 12-28-17 | |

| | | | | | | |
|--------------------------|-----------------------|-----|----------|----------|----------|--|
| Client ID: | TOSMO-20171219 | | | | | |
| Laboratory ID: | 12-194-12 | | | | | |
| Dissolved Organic Carbon | 6.9 | 1.0 | SM 5310B | 12-28-17 | 12-28-17 | |

| | | | | | | |
|--------------------------|-----------------------|-----|----------|----------|----------|--|
| Client ID: | TYLMI-20171219 | | | | | |
| Laboratory ID: | 12-194-13 | | | | | |
| Dissolved Organic Carbon | 8.9 | 1.0 | SM 5310B | 12-28-17 | 12-28-17 | |

| | | | | | | |
|--------------------------|-----------------------|-----|----------|----------|----------|--|
| Client ID: | TYLMO-20171219 | | | | | |
| Laboratory ID: | 12-194-14 | | | | | |
| Dissolved Organic Carbon | 5.9 | 1.0 | SM 5310B | 12-28-17 | 12-28-17 | |



Date of Report: January 3, 2018
Samples Submitted: December 19, 2017
Laboratory Reference: 1712-194
Project: 14-05806-000

**DISSOLVED ORGANIC CARBON
SM 5310B**

Matrix: Water
Units: mg/L

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|--------------------------|----------------------|------------|---------------|----------------------|----------------------|--------------|
| Client ID: | QA39-20171219 | | | | | |
| Laboratory ID: | 12-194-15 | | | | | |
| Dissolved Organic Carbon | 12 | 1.0 | SM 5310B | 12-28-17 | 12-28-17 | |



Date of Report: January 3, 2018
 Samples Submitted: December 19, 2017
 Laboratory Reference: 1712-194
 Project: 14-05806-000

**DISSOLVED ORGANIC CARBON
 SM 5310B
 QUALITY CONTROL**

Matrix: Water
 Units: mg/L

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|--------------------------|-----------|-----|----------|---------------|---------------|-------|
| METHOD BLANK | | | | | | |
| Laboratory ID: | MB1228D1 | | | | | |
| Dissolved Organic Carbon | ND | 1.0 | SM 5310B | 12-28-17 | 12-28-17 | |

| Analyte | Result | Spike Level | Source Result | Percent Recovery | Recovery Limits | RPD | RPD Limit | Flags |
|--------------------------|-------------|-------------|---------------|------------------|-----------------|-----|-----------|-------|
| DUPLICATE | | | | | | | | |
| Laboratory ID: | 12-194-01 | | | | | | | |
| | ORIG | DUP | | | | | | |
| Dissolved Organic Carbon | 12.7 | 12.7 | NA | NA | NA | 0 | 15 | |

MATRIX SPIKE

| | | | | | | | | |
|--------------------------|-------------|------|------|----|--------|----|----|--|
| Laboratory ID: | 12-194-01 | | | | | | | |
| | MS | MS | | MS | | | | |
| Dissolved Organic Carbon | 22.5 | 10.0 | 12.7 | 98 | 75-125 | NA | NA | |

SPIKE BLANK

| | | | | | | | | |
|--------------------------|-------------|------|----|-----|--------|----|----|--|
| Laboratory ID: | SB1228D1 | | | | | | | |
| | SB | SB | | SB | | | | |
| Dissolved Organic Carbon | 10.1 | 10.0 | NA | 101 | 80-120 | NA | NA | |



Date of Report: January 3, 2018
 Samples Submitted: December 19, 2017
 Laboratory Reference: 1712-194
 Project: 14-05806-000

TOTAL PHOSPHORUS
EPA 365.1

Matrix: Water
 Units: mg/L

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|-------------------|----------------------|-------|-----------|---------------|---------------|-------|
| Client ID: | COLM-20171219 | | | | | |
| Laboratory ID: | 12-194-01 | | | | | |
| Total Phosphorus | ND | 0.010 | EPA 365.1 | 1-2-18 | 1-2-18 | |

| | | | | | | |
|-------------------|-----------------------|-------|-----------|--------|--------|--|
| Client ID: | COUMI-20171219 | | | | | |
| Laboratory ID: | 12-194-02 | | | | | |
| Total Phosphorus | 0.15 | 0.010 | EPA 365.1 | 1-2-18 | 1-2-18 | |

| | | | | | | |
|-------------------|-----------------------|-------|-----------|--------|--------|--|
| Client ID: | COUMO-20171219 | | | | | |
| Laboratory ID: | 12-194-03 | | | | | |
| Total Phosphorus | 0.12 | 0.010 | EPA 365.1 | 1-2-18 | 1-2-18 | |

| | | | | | | |
|-------------------|-----------------------|-------|-----------|--------|--------|--|
| Client ID: | EVAMS-20171219 | | | | | |
| Laboratory ID: | 12-194-04 | | | | | |
| Total Phosphorus | 0.068 | 0.010 | EPA 365.1 | 1-2-18 | 1-2-18 | |

| | | | | | | |
|-------------------|------------------------|-------|-----------|--------|--------|--|
| Client ID: | EVALSS-20171219 | | | | | |
| Laboratory ID: | 12-194-05 | | | | | |
| Total Phosphorus | 0.13 | 0.010 | EPA 365.1 | 1-2-18 | 1-2-18 | |

| | | | | | | |
|-------------------|-----------------------|-------|-----------|--------|--------|--|
| Client ID: | MONMN-20171219 | | | | | |
| Laboratory ID: | 12-194-06 | | | | | |
| Total Phosphorus | 0.16 | 0.010 | EPA 365.1 | 1-2-18 | 1-2-18 | |

| | | | | | | |
|-------------------|-----------------------|-------|-----------|--------|--------|--|
| Client ID: | MONMS-20171219 | | | | | |
| Laboratory ID: | 12-194-07 | | | | | |
| Total Phosphorus | 0.050 | 0.010 | EPA 365.1 | 1-2-18 | 1-2-18 | |



Date of Report: January 3, 2018
 Samples Submitted: December 19, 2017
 Laboratory Reference: 1712-194
 Project: 14-05806-000

TOTAL PHOSPHORUS
EPA 365.1

Matrix: Water
 Units: mg/L

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|-------------------|----------------------|-------|-----------|---------------|---------------|-------|
| Client ID: | MONM-20171219 | | | | | |
| Laboratory ID: | 12-194-08 | | | | | |
| Total Phosphorus | 0.063 | 0.010 | EPA 365.1 | 1-2-18 | 1-2-18 | |

| | | | | | | |
|-------------------|-----------------------|-------|-----------|--------|--------|--|
| Client ID: | SEIMN-20171219 | | | | | |
| Laboratory ID: | 12-194-09 | | | | | |
| Total Phosphorus | 0.25 | 0.010 | EPA 365.1 | 1-2-18 | 1-2-18 | |

| | | | | | | |
|-------------------|-----------------------|-------|-----------|--------|--------|--|
| Client ID: | SEIMS-20171219 | | | | | |
| Laboratory ID: | 12-194-10 | | | | | |
| Total Phosphorus | 0.052 | 0.010 | EPA 365.1 | 1-2-18 | 1-2-18 | |

| | | | | | | |
|-------------------|-----------------------|-------|-----------|--------|--------|--|
| Client ID: | TOSMI-20171219 | | | | | |
| Laboratory ID: | 12-194-11 | | | | | |
| Total Phosphorus | 0.21 | 0.010 | EPA 365.1 | 1-2-18 | 1-2-18 | |

| | | | | | | |
|-------------------|-----------------------|-------|-----------|--------|--------|--|
| Client ID: | TOSMO-20171219 | | | | | |
| Laboratory ID: | 12-194-12 | | | | | |
| Total Phosphorus | 0.18 | 0.010 | EPA 365.1 | 1-2-18 | 1-2-18 | |

| | | | | | | |
|-------------------|-----------------------|-------|-----------|--------|--------|--|
| Client ID: | TYLMI-20171219 | | | | | |
| Laboratory ID: | 12-194-13 | | | | | |
| Total Phosphorus | 0.11 | 0.010 | EPA 365.1 | 1-2-18 | 1-2-18 | |

| | | | | | | |
|-------------------|-----------------------|-------|-----------|--------|--------|--|
| Client ID: | TYLMO-20171219 | | | | | |
| Laboratory ID: | 12-194-14 | | | | | |
| Total Phosphorus | 0.10 | 0.010 | EPA 365.1 | 1-2-18 | 1-2-18 | |



Date of Report: January 3, 2018
Samples Submitted: December 19, 2017
Laboratory Reference: 1712-194
Project: 14-05806-000

TOTAL PHOSPHORUS
EPA 365.1

Matrix: Water
Units: mg/L

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|-------------------|----------------------|------------|---------------|----------------------|----------------------|--------------|
| Client ID: | QA39-20171219 | | | | | |
| Laboratory ID: | 12-194-15 | | | | | |
| Total Phosphorus | 0.050 | 0.010 | EPA 365.1 | 1-2-18 | 1-2-18 | |



Date of Report: January 3, 2018
 Samples Submitted: December 19, 2017
 Laboratory Reference: 1712-194
 Project: 14-05806-000

**TOTAL PHOSPHORUS
 EPA 365.1
 QUALITY CONTROL**

Matrix: Water
 Units: mg/L

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|---------------------|-----------|-------|-----------|---------------|---------------|-------|
| METHOD BLANK | | | | | | |
| Laboratory ID: | MB0102W1 | | | | | |
| Total Phosphorus | ND | 0.010 | EPA 365.1 | 1-2-18 | 1-2-18 | |

| Analyte | Result | Spike Level | Source Result | Percent Recovery | Recovery Limits | RPD | RPD Limit | Flags |
|------------------|-----------|-------------|---------------|------------------|-----------------|-----|-----------|-------|
| DUPLICATE | | | | | | | | |
| Laboratory ID: | 12-194-01 | | | | | | | |
| | ORIG | DUP | | | | | | |
| Total Phosphorus | ND | ND | NA | NA | NA | NA | 11 | |

| | | | | | | | | |
|---------------------|--------------|-------|----|----|--------|----|----|--|
| MATRIX SPIKE | | | | | | | | |
| Laboratory ID: | 12-194-01 | | | | | | | |
| | MS | MS | | MS | | | | |
| Total Phosphorus | 0.242 | 0.250 | ND | 97 | 82-124 | NA | NA | |

| | | | | | | | | |
|--------------------|--------------|-------|----|-----|--------|----|----|--|
| SPIKE BLANK | | | | | | | | |
| Laboratory ID: | SB0102W1 | | | | | | | |
| | SB | SB | | SB | | | | |
| Total Phosphorus | 0.253 | 0.250 | NA | 101 | 87-114 | NA | NA | |



Date of Report: January 3, 2018
 Samples Submitted: December 19, 2017
 Laboratory Reference: 1712-194
 Project: 14-05806-000

TOTAL METALS
EPA 200.8

Matrix: Water
 Units: ug/L (ppb)

| Analyte | Result | PQL | EPA Method | Date Prepared | Date Analyzed | Flags |
|-----------------------------------|--------|-----|------------|---------------|---------------|-------|
| Lab ID: 12-194-01 | | | | | | |
| Client ID: COLM-20171219 | | | | | | |
| Copper | ND | 1.0 | 200.8 | 1-2-18 | 1-2-18 | |
| Zinc | ND | 5.0 | 200.8 | 1-2-18 | 1-2-18 | |
| Lab ID: 12-194-02 | | | | | | |
| Client ID: COUMI-20171219 | | | | | | |
| Copper | 6.0 | 1.0 | 200.8 | 1-2-18 | 1-2-18 | |
| Zinc | 37 | 5.0 | 200.8 | 1-2-18 | 1-2-18 | |
| Lab ID: 12-194-03 | | | | | | |
| Client ID: COUMO-20171219 | | | | | | |
| Copper | 5.4 | 1.0 | 200.8 | 1-2-18 | 1-2-18 | |
| Zinc | 38 | 5.0 | 200.8 | 1-2-18 | 1-2-18 | |
| Lab ID: 12-194-04 | | | | | | |
| Client ID: EVAMS-20171219 | | | | | | |
| Copper | 2.1 | 1.0 | 200.8 | 1-2-18 | 1-2-18 | |
| Zinc | 6.7 | 5.0 | 200.8 | 1-2-18 | 1-2-18 | |
| Lab ID: 12-194-05 | | | | | | |
| Client ID: EVALSS-20171219 | | | | | | |
| Copper | 5.2 | 1.0 | 200.8 | 1-2-18 | 1-2-18 | |
| Zinc | 15 | 5.0 | 200.8 | 1-2-18 | 1-2-18 | |
| Lab ID: 12-194-06 | | | | | | |
| Client ID: MONMN-20171219 | | | | | | |
| Copper | 3.8 | 1.0 | 200.8 | 1-2-18 | 1-2-18 | |
| Zinc | 22 | 5.0 | 200.8 | 1-2-18 | 1-2-18 | |



Date of Report: January 3, 2018
 Samples Submitted: December 19, 2017
 Laboratory Reference: 1712-194
 Project: 14-05806-000

TOTAL METALS
EPA 200.8

Matrix: Water
 Units: ug/L (ppb)

| Analyte | Result | PQL | EPA Method | Date Prepared | Date Analyzed | Flags |
|-------------------|-----------------------|-----|------------|---------------|---------------|-------|
| Lab ID: | 12-194-07 | | | | | |
| Client ID: | MONMS-20171219 | | | | | |
| Copper | 3.1 | 1.0 | 200.8 | 1-2-18 | 1-2-18 | |
| Zinc | 8.6 | 5.0 | 200.8 | 1-2-18 | 1-2-18 | |
| Lab ID: | 12-194-08 | | | | | |
| Client ID: | MONM-20171219 | | | | | |
| Copper | 3.0 | 1.0 | 200.8 | 1-2-18 | 1-2-18 | |
| Zinc | 15 | 5.0 | 200.8 | 1-2-18 | 1-2-18 | |
| Lab ID: | 12-194-09 | | | | | |
| Client ID: | SEIMN-20171219 | | | | | |
| Copper | 6.1 | 1.0 | 200.8 | 1-2-18 | 1-2-18 | |
| Zinc | 10 | 5.0 | 200.8 | 1-2-18 | 1-2-18 | |
| Lab ID: | 12-194-10 | | | | | |
| Client ID: | SEIMS-20171219 | | | | | |
| Copper | 1.7 | 1.0 | 200.8 | 1-2-18 | 1-2-18 | |
| Zinc | ND | 5.0 | 200.8 | 1-2-18 | 1-2-18 | |
| Lab ID: | 12-194-11 | | | | | |
| Client ID: | TOSMI-20171219 | | | | | |
| Copper | 15 | 1.0 | 200.8 | 1-2-18 | 1-2-18 | |
| Zinc | 150 | 5.0 | 200.8 | 1-2-18 | 1-2-18 | |
| Lab ID: | 12-194-12 | | | | | |
| Client ID: | TOSMO-20171219 | | | | | |
| Copper | 12 | 2.5 | 200.8 | 1-2-18 | 1-2-18 | |
| Zinc | 250 | 13 | 200.8 | 1-2-18 | 1-2-18 | |



Date of Report: January 3, 2018
 Samples Submitted: December 19, 2017
 Laboratory Reference: 1712-194
 Project: 14-05806-000

TOTAL METALS
EPA 200.8

Matrix: Water
 Units: ug/L (ppb)

| Analyte | Result | PQL | EPA Method | Date Prepared | Date Analyzed | Flags |
|-------------------|-----------------------|------------|-------------------|----------------------|----------------------|--------------|
| Lab ID: | 12-194-13 | | | | | |
| Client ID: | TYLMI-20171219 | | | | | |
| Copper | 7.0 | 1.0 | 200.8 | 1-2-18 | 1-2-18 | |
| Zinc | 22 | 5.0 | 200.8 | 1-2-18 | 1-2-18 | |

| | | | | | | |
|-------------------|-----------------------|-----|-------|--------|--------|--|
| Lab ID: | 12-194-14 | | | | | |
| Client ID: | TYLMO-20171219 | | | | | |
| Copper | 6.4 | 1.0 | 200.8 | 1-2-18 | 1-2-18 | |
| Zinc | 26 | 5.0 | 200.8 | 1-2-18 | 1-2-18 | |

| | | | | | | |
|-------------------|----------------------|-----|-------|--------|--------|--|
| Lab ID: | 12-194-15 | | | | | |
| Client ID: | QA39-20171219 | | | | | |
| Copper | 2.1 | 1.0 | 200.8 | 1-2-18 | 1-2-18 | |
| Zinc | 7.3 | 5.0 | 200.8 | 1-2-18 | 1-2-18 | |



Date of Report: January 3, 2018
Samples Submitted: December 19, 2017
Laboratory Reference: 1712-194
Project: 14-05806-000

TOTAL METALS
EPA 200.8
METHOD BLANK QUALITY CONTROL

Date Extracted: 1-2-18
Date Analyzed: 1-2-18

Matrix: Water
Units: ug/L (ppb)

Lab ID: MB0102WH2

| Analyte | Method | Result | PQL |
|---------|--------|-----------|-----|
| Copper | 200.8 | ND | 1.0 |
| Zinc | 200.8 | ND | 5.0 |



Date of Report: January 3, 2018
Samples Submitted: December 19, 2017
Laboratory Reference: 1712-194
Project: 14-05806-000

**TOTAL METALS
EPA 200.8
DUPLICATE QUALITY CONTROL**

Date Extracted: 1-2-18

Date Analyzed: 1-2-18

Matrix: Water

Units: ug/L (ppb)

Lab ID: 12-168-07

| Analyte | Sample Result | Duplicate Result | RPD | PQL | Flags |
|---------|---------------|------------------|-----|-----|-------|
| Copper | ND | ND | NA | 1.0 | |
| Zinc | ND | ND | NA | 5.0 | |



Date of Report: January 6, 2017
 Samples Submitted: January 6, 2017
 Laboratory Reference: 1712-194
 Project: 14-05806-000

**TOTAL METALS
 EPA 200.8
 MS/MSD QUALITY CONTROL**

Date Extracted: 1-2-18

Date Analyzed: 1-2-18

Matrix: Water

Units: ug/L (ppb)

Lab ID: 12-168-07

| Analyte | Spike Level | MS | Percent Recovery | MSD | Percent Recovery | RPD | Flags |
|---------|-------------|------------|------------------|------------|------------------|-----|-------|
| Copper | 100 | 107 | 107 | 110 | 110 | 3 | |
| Zinc | 100 | 109 | 109 | 116 | 116 | 6 | |



Date of Report: January 3, 2018
 Samples Submitted: December 19, 2017
 Laboratory Reference: 1712-194
 Project: 14-05806-000

DISSOLVED METALS
EPA 200.8

Matrix: Water
 Units: ug/L (ppb)

| Analyte | Result | PQL | EPA Method | Date Prepared | Date Analyzed | Flags |
|-----------------------------------|--------|-----|------------|---------------|---------------|-------|
| Lab ID: 12-194-01 | | | | | | |
| Client ID: COLM-20171219 | | | | | | |
| Copper | ND | 1.0 | 200.8 | | 1-2-18 | |
| Zinc | ND | 5.0 | 200.8 | | 1-2-18 | |
| Lab ID: 12-194-02 | | | | | | |
| Client ID: COUMI-20171219 | | | | | | |
| Copper | 4.1 | 1.0 | 200.8 | | 1-2-18 | |
| Zinc | 11 | 5.0 | 200.8 | | 1-2-18 | |
| Lab ID: 12-194-03 | | | | | | |
| Client ID: COUMO-20171219 | | | | | | |
| Copper | 2.0 | 1.0 | 200.8 | | 1-2-18 | |
| Zinc | 12 | 5.0 | 200.8 | | 1-2-18 | |
| Lab ID: 12-194-04 | | | | | | |
| Client ID: EVAMS-20171219 | | | | | | |
| Copper | 1.3 | 1.0 | 200.8 | | 1-2-18 | |
| Zinc | ND | 5.0 | 200.8 | | 1-2-18 | |
| Lab ID: 12-194-05 | | | | | | |
| Client ID: EVALSS-20171219 | | | | | | |
| Copper | 5.2 | 1.0 | 200.8 | | 1-2-18 | |
| Zinc | 5.9 | 5.0 | 200.8 | | 1-2-18 | |
| Lab ID: 12-194-06 | | | | | | |
| Client ID: MONMN-20171219 | | | | | | |
| Copper | 1.6 | 1.0 | 200.8 | | 1-2-18 | |
| Zinc | 6.8 | 5.0 | 200.8 | | 1-2-18 | |



Date of Report: January 3, 2018
 Samples Submitted: December 19, 2017
 Laboratory Reference: 1712-194
 Project: 14-05806-000

DISSOLVED METALS
EPA 200.8

Matrix: Water
 Units: ug/L (ppb)

| Analyte | Result | PQL | EPA Method | Date Prepared | Date Analyzed | Flags |
|-------------------|-----------------------|-----|------------|---------------|---------------|-------|
| Lab ID: | 12-194-07 | | | | | |
| Client ID: | MONMS-20171219 | | | | | |
| Copper | 2.1 | 1.0 | 200.8 | | 1-2-18 | |
| Zinc | 5.3 | 5.0 | 200.8 | | 1-2-18 | |
| Lab ID: | 12-194-08 | | | | | |
| Client ID: | MONM-20171219 | | | | | |
| Copper | 1.7 | 1.0 | 200.8 | | 1-2-18 | |
| Zinc | 7.4 | 5.0 | 200.8 | | 1-2-18 | |
| Lab ID: | 12-194-09 | | | | | |
| Client ID: | SEIMN-20171219 | | | | | |
| Copper | 1.3 | 1.0 | 200.8 | | 1-2-18 | |
| Zinc | ND | 5.0 | 200.8 | | 1-2-18 | |
| Lab ID: | 12-194-10 | | | | | |
| Client ID: | SEIMS-20171219 | | | | | |
| Copper | 2.1 | 1.0 | 200.8 | | 1-2-18 | |
| Zinc | ND | 5.0 | 200.8 | | 1-2-18 | |
| Lab ID: | 12-194-11 | | | | | |
| Client ID: | TOSMI-20171219 | | | | | |
| Copper | 4.5 | 1.0 | 200.8 | | 1-2-18 | |
| Zinc | 24 | 5.0 | 200.8 | | 1-2-18 | |
| Lab ID: | 12-194-12 | | | | | |
| Client ID: | TOSMO-20171219 | | | | | |
| Copper | 2.6 | 1.0 | 200.8 | | 1-2-18 | |
| Zinc | 110 | 5.0 | 200.8 | | 1-2-18 | |



Date of Report: January 3, 2018
 Samples Submitted: December 19, 2017
 Laboratory Reference: 1712-194
 Project: 14-05806-000

DISSOLVED METALS
EPA 200.8

Matrix: Water
 Units: ug/L (ppb)

| Analyte | Result | PQL | EPA Method | Date Prepared | Date Analyzed | Flags |
|-------------------|-----------------------|------------|-------------------|----------------------|----------------------|--------------|
| Lab ID: | 12-194-13 | | | | | |
| Client ID: | TYLMI-20171219 | | | | | |
| Copper | 4.1 | 1.0 | 200.8 | | 1-2-18 | |
| Zinc | 8.2 | 5.0 | 200.8 | | 1-2-18 | |
| Lab ID: | 12-194-14 | | | | | |
| Client ID: | TYLMO-20171219 | | | | | |
| Copper | 2.5 | 1.0 | 200.8 | | 1-2-18 | |
| Zinc | 7.9 | 5.0 | 200.8 | | 1-2-18 | |
| Lab ID: | 12-194-15 | | | | | |
| Client ID: | QA39-20171219 | | | | | |
| Copper | 2.1 | 1.0 | 200.8 | | 1-2-18 | |
| Zinc | ND | 5.0 | 200.8 | | 1-2-18 | |



Date of Report: January 3, 2018
Samples Submitted: December 19, 2017
Laboratory Reference: 1712-194
Project: 14-05806-000

**DISSOLVED METALS
EPA 200.8
METHOD BLANK QUALITY CONTROL**

Date Analyzed: 1-2-18

Matrix: Water
Units: ug/L (ppb)

Lab ID: MB0102D1

| Analyte | Method | Result | PQL |
|---------|--------|-----------|-----|
| Copper | 200.8 | ND | 1.0 |
| Zinc | 200.8 | ND | 5.0 |



Date of Report: January 3, 2018
Samples Submitted: December 19, 2017
Laboratory Reference: 1712-194
Project: 14-05806-000

**DISSOLVED METALS
EPA 200.8
DUPLICATE QUALITY CONTROL**

Date Analyzed: 1-2-18

Matrix: Water
Units: ug/L (ppb)

Lab ID: 12-194-15

| Analyte | Sample Result | Duplicate Result | RPD | PQL | Flags |
|---------|---------------|------------------|-----|-----|-------|
| Copper | 2.06 | 2.02 | 2 | 1.0 | |
| Zinc | ND | 5.14 | NA | 5.0 | |



Date of Report: January 3, 2018
 Samples Submitted: December 19, 2017
 Laboratory Reference: 1712-194
 Project: 14-05806-000

**DISSOLVED METALS
 EPA 200.8
 MS/MSD QUALITY CONTROL**

Date Analyzed: 1-2-18

Matrix: Water
 Units: ug/L (ppb)

Lab ID: 12-194-15

| Analyte | Spike Level | MS | Percent Recovery | MSD | Percent Recovery | RPD | Flags |
|---------|-------------|-------------|------------------|-------------|------------------|-----|-------|
| Copper | 80.0 | 77.2 | 94 | 77.4 | 94 | 0 | |
| Zinc | 80.0 | 84.8 | 106 | 84.0 | 105 | 1 | |





Data Qualifiers and Abbreviations

- A - Due to a high sample concentration, the amount spiked is insufficient for meaningful MS/MSD recovery data.
 - B - The analyte indicated was also found in the blank sample.
 - C - The duplicate RPD is outside control limits due to high result variability when analyte concentrations are within five times the quantitation limit.
 - E - The value reported exceeds the quantitation range and is an estimate.
 - F - Surrogate recovery data is not available due to the high concentration of coeluting target compounds.
 - H - The analyte indicated is a common laboratory solvent and may have been introduced during sample preparation, and be impacting the sample result.
 - I - Compound recovery is outside of the control limits.
 - J - The value reported was below the practical quantitation limit. The value is an estimate.
 - K - Sample duplicate RPD is outside control limits due to sample inhomogeneity. The sample was re-extracted and re-analyzed with similar results.
 - L - The RPD is outside of the control limits.
 - M - Hydrocarbons in the gasoline range are impacting the diesel range result.
 - M1 - Hydrocarbons in the gasoline range (toluene-naphthalene) are present in the sample.
 - N - Hydrocarbons in the lube oil range are impacting the diesel range result.
 - N1 - Hydrocarbons in diesel range are impacting lube oil range results.
 - O - Hydrocarbons indicative of heavier fuels are present in the sample and are impacting the gasoline result.
 - P - The RPD of the detected concentrations between the two columns is greater than 40.
 - Q - Surrogate recovery is outside of the control limits.
 - S - Surrogate recovery data is not available due to the necessary dilution of the sample.
 - T - The sample chromatogram is not similar to a typical _____.
 - U - The analyte was analyzed for, but was not detected above the reported sample quantitation limit.
 - U1 - The practical quantitation limit is elevated due to interferences present in the sample.
 - V - Matrix Spike/Matrix Spike Duplicate recoveries are outside control limits due to matrix effects.
 - W - Matrix Spike/Matrix Spike Duplicate RPD are outside control limits due to matrix effects.
 - X - Sample extract treated with a mercury cleanup procedure.
 - X1 - Sample extract treated with a Sulfuric acid/Silica gel cleanup procedure.
 - Y - The calibration verification for this analyte exceeded the 20% drift specified in method 8260C, and therefore the reported result should be considered an estimate. The overall performance of the calibration verification standard met the acceptance criteria of the method.
 - Z -
- ND - Not Detected at PQL
 PQL - Practical Quantitation Limit
 RPD - Relative Percent Difference





Am Test Inc.
13600 NE 126TH PL
Suite C
Kirkland, WA 98034
(425) 885-1664

**Professional
Analytical
Services**

Jan 3 2018
On-Site Environmental
14648 NE 95th ST
Redmond, WA 98052
Attention: David Baumeister

Dear David Baumeister:

Enclosed please find the analytical data for your REDMOND PAIRED WATERSHED STUDY project.

The following is a cross correlation of client and laboratory identifications for your convenience.

| CLIENT ID | MATRIX | AMTEST ID | TEST |
|-----------------|--------|------------|------------|
| COLM-20171219 | Water | 17-A022135 | Micro, NUT |
| COUMI-20171219 | Water | 17-A022136 | Micro, NUT |
| COUMO-20171219 | Water | 17-A022137 | Micro, NUT |
| EVAMS-20171219 | Water | 17-A022138 | Micro, NUT |
| EVALSS-20171219 | Water | 17-A022139 | Micro, NUT |
| MONMN-20171219 | Water | 17-A022140 | Micro, NUT |
| MONMS-20171219 | Water | 17-A022141 | Micro, NUT |
| MONM-20171219 | Water | 17-A022142 | Micro, NUT |
| SEIMN-20171219 | Water | 17-A022143 | Micro, NUT |
| SEIMS-20171219 | Water | 17-A022144 | Micro, NUT |
| TOSMI-20171219 | Water | 17-A022145 | Micro, NUT |
| TOSMO-20171219 | Water | 17-A022146 | Micro, NUT |
| TYLMI-20171219 | Water | 17-A022147 | Micro, NUT |
| TYLMO-20171219 | Water | 17-A022148 | Micro, NUT |
| QA39-20171219 | Water | 17-A022149 | Micro, NUT |

Your samples were received on Tuesday, December 19, 2017. At the time of receipt, the samples were logged in and properly maintained prior to the subsequent analysis.

The analytical procedures used at AmTest are well documented and are typically derived from the protocols of the EPA, USDA, FDA or the Army Corps of Engineers.

Following the analytical data you will find the Quality Control (QC) results.

Please note that the detection limits that are listed in the body of the report refer to the Practical Quantitation Limits (PQL's), as opposed to the Method Detection Limits (MDL's).

Am Test Inc.
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Suite C
Kirkland, WA 98034
(425) 885-1664

**Professional
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Services**

Jan 3 2018
On-Site Environmental
continued . . .

If you should have any questions pertaining to the data package, please feel free to contact me.

Sincerely,


Aaron W. Young
Laboratory Manager

Project #: 14-05806-000
PO Number: 12-194

BACT = Bacteriological
CONV = Conventional

MET = Metals
ORG = Organics

NUT=Nutrients
DEM=Demand

MIN=Minerals

Am Test Inc.
13600 NE 126TH PL
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www.amtestlab.com



*Professional
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Services*

ANALYSIS REPORT

On-Site Environmental
14648 NE 95th ST
Redmond, WA 98052
Attention: David Baumeister
Project Name: REDMOND PAIRED WATERSHED STUDY
Project #: 14-05806-000
PO Number: 12-194
All results reported on an as received basis.

Date Received: 12/19/17
Date Reported: 1/ 3/18

AMTEST Identification Number 17-A022135
Client Identification COLM-20171219
Sampling Date 12/19/17, 10:30

Results

| PARAMETER | RESULT | UNITS | Q | D.L. | METHOD | ANALYST | DATE |
|--------------------------|--------|------------|---|------|-----------|---------|----------|
| Fecal Coliform | 180 | CFU/100 ml | | 1 | SM 9222D | JM | 12/19/17 |
| Total Nitrogen (NOX&TKN) | 0.83 | mg/l | | 0.1 | | | |
| Total Nitrogen (TKN) | 0.670 | mg/l | | 0.1 | SM4500N | JC | 12/29/17 |
| Nitrate + Nitrite | 0.16 | mg/l | | 0.01 | SM4500NO3 | JC | 12/28/17 |

AMTEST Identification Number 17-A022136
Client Identification COUMI-20171219
Sampling Date 12/19/17, 06:40

Results

| PARAMETER | RESULT | UNITS | Q | D.L. | METHOD | ANALYST | DATE |
|--------------------------|--------|------------|---|------|-----------|---------|----------|
| Fecal Coliform | 360 | CFU/100 ml | | 1 | SM 9222D | JM | 12/19/17 |
| Total Nitrogen (NOX&TKN) | 1.92 | mg/l | | 0.1 | | | |
| Total Nitrogen (TKN) | 1.30 | mg/l | | 0.1 | SM4500N | JC | 12/29/17 |
| Nitrate + Nitrite | 0.62 | mg/l | | 0.01 | SM4500NO3 | JC | 12/27/17 |

AMTEST Identification Number 17-A022137
Client Identification COUMO-20171219
Sampling Date 12/19/17, 06:25

Results

| PARAMETER | RESULT | UNITS | Q | D.L. | METHOD | ANALYST | DATE |
|--------------------------|--------|------------|---|------|-----------|---------|----------|
| Fecal Coliform | 770 | CFU/100 ml | | 1 | SM 9222D | JM | 12/19/17 |
| Total Nitrogen (NOX&TKN) | 1.61 | mg/l | | 0.1 | | | |
| Total Nitrogen (TKN) | 1.10 | mg/l | | 0.1 | SM4500N | JC | 12/29/17 |
| Nitrate + Nitrite | 0.51 | mg/l | | 0.01 | SM4500NO3 | JC | 12/27/17 |

AMTEST Identification Number 17-A022138
Client Identification EVAMS-20171219
Sampling Date 12/19/17, 07:40

Results

| PARAMETER | RESULT | UNITS | Q | D.L. | METHOD | ANALYST | DATE |
|--------------------------|--------|------------|---|------|-----------|---------|----------|
| Fecal Coliform | 690 | CFU/100 ml | | 1 | SM 9222D | JM | 12/19/17 |
| Total Nitrogen (NOX&TKN) | 2.40 | mg/l | | 0.1 | | | |
| Total Nitrogen (TKN) | 1.20 | mg/l | | 0.1 | SM4500N | JC | 12/29/17 |
| Nitrate + Nitrite | 1.2 | mg/l | | 0.01 | SM4500NO3 | JC | 12/27/17 |

AMTEST Identification Number 17-A022139
Client Identification EVALSS-20171219
Sampling Date 12/19/17, 08:50

Results

| PARAMETER | RESULT | UNITS | Q | D.L. | METHOD | ANALYST | DATE |
|--------------------------|--------|------------|---|------|-----------|---------|----------|
| Fecal Coliform | 530 | CFU/100 ml | | 1 | SM 9222D | JM | 12/19/17 |
| Total Nitrogen (NOX&TKN) | 2.60 | mg/l | | 0.1 | | | |
| Total Nitrogen (TKN) | 1.50 | mg/l | | 0.1 | SM4500N | JC | 12/29/17 |
| Nitrate + Nitrite | 1.1 | mg/l | | 0.01 | SM4500NO3 | JC | 12/27/17 |

AMTEST Identification Number 17-A022140
Client Identification MONMN-20171219
Sampling Date 12/19/17, 08:30

Results

| PARAMETER | RESULT | UNITS | Q | D.L. | METHOD | ANALYST | DATE |
|--------------------------|--------|------------|---|------|-----------|---------|----------|
| Fecal Coliform | 460 | CFU/100 ml | | 1 | SM 9222D | JM | 12/19/17 |
| Total Nitrogen (NOX&TKN) | 1.26 | mg/l | | 0.1 | | | |
| Total Nitrogen (TKN) | 0.832 | mg/l | | 0.1 | SM4500N | JC | 12/29/17 |
| Nitrate + Nitrite | 0.43 | mg/l | | 0.01 | SM4500NO3 | JC | 12/27/17 |

AMTEST Identification Number 17-A022141
Client Identification MONMS-20171219
Sampling Date 12/19/17, 08:45

Results

| PARAMETER | RESULT | UNITS | Q | D.L. | METHOD | ANALYST | DATE |
|--------------------------|--------|------------|---|------|-----------|---------|----------|
| Fecal Coliform | 480 | CFU/100 ml | | 1 | SM 9222D | JM | 12/19/17 |
| Total Nitrogen (NOX&TKN) | 1.22 | mg/l | | 0.1 | | | |
| Total Nitrogen (TKN) | 0.705 | mg/l | | 0.1 | SM4500N | JC | 12/29/17 |
| Nitrate + Nitrite | 0.51 | mg/l | | 0.01 | SM4500NO3 | JC | 12/27/17 |

AMTEST Identification Number 17-A022142
Client Identification MONM-20171219
Sampling Date 12/19/17, 09:45

Results

| PARAMETER | RESULT | UNITS | Q | D.L. | METHOD | ANALYST | DATE |
|--------------------------|--------|------------|---|------|-----------|---------|----------|
| Fecal Coliform | 480 | CFU/100 ml | | 1 | SM 9222D | JM | 12/19/17 |
| Total Nitrogen (NOX&TKN) | 1.31 | mg/l | | 0.1 | | | |
| Total Nitrogen (TKN) | 0.764 | mg/l | | 0.1 | SM4500N | JC | 12/29/17 |
| Nitrate + Nitrite | 0.55 | mg/l | | 0.01 | SM4500NO3 | JC | 12/27/17 |

AMTEST Identification Number 17-A022143
Client Identification SEIMN-20171219
Sampling Date 12/19/17, 09:40

Results

| PARAMETER | RESULT | UNITS | Q | D.L. | METHOD | ANALYST | DATE |
|--------------------------|--------|------------|---|------|-----------|---------|----------|
| Fecal Coliform | 65. | CFU/100 ml | | 1 | SM 9222D | JM | 12/19/17 |
| Total Nitrogen (NOX&TKN) | 3.70 | mg/l | | 0.1 | | | |
| Total Nitrogen (TKN) | 1.10 | mg/l | | 0.1 | SM4500N | JC | 12/29/17 |
| Nitrate + Nitrite | 2.6 | mg/l | | 0.01 | SM4500NO3 | JC | 12/27/17 |

AMTEST Identification Number 17-A022144
Client Identification SEIMS-20171219
Sampling Date 12/19/17, 09:20

Results

| PARAMETER | RESULT | UNITS | Q | D.L. | METHOD | ANALYST | DATE |
|--------------------------|--------|------------|---|------|-----------|---------|----------|
| Fecal Coliform | 760 | CFU/100 ml | | 1 | SM 9222D | JM | 12/19/17 |
| Total Nitrogen (NOX&TKN) | 1.01 | mg/l | | 0.1 | | | |
| Total Nitrogen (TKN) | 0.943 | mg/l | | 0.1 | SM4500N | JC | 12/29/17 |
| Nitrate + Nitrite | 0.065 | mg/l | | 0.01 | SM4500NO3 | JC | 12/27/17 |

AMTEST Identification Number 17-A022145
Client Identification TOSMI-20171219
Sampling Date 12/19/17, 06:40

Results

| PARAMETER | RESULT | UNITS | Q | D.L. | METHOD | ANALYST | DATE |
|--------------------------|--------|------------|---|------|-----------|---------|----------|
| Fecal Coliform | 1800 | CFU/100 ml | | 1 | SM 9222D | JM | 12/19/17 |
| Total Nitrogen (NOX&TKN) | 1.05 | mg/l | | 0.1 | | | |
| Total Nitrogen (TKN) | 0.753 | mg/l | | 0.1 | SM4500N | JC | 12/29/17 |
| Nitrate + Nitrite | 0.30 | mg/l | | 0.01 | SM4500NO3 | JC | 12/27/17 |

AMTEST Identification Number 17-A022146
Client Identification TOSMO-20171219
Sampling Date 12/19/17, 07:00

Results

| PARAMETER | RESULT | UNITS | Q | D.L. | METHOD | ANALYST | DATE |
|--------------------------|--------|------------|---|------|-----------|---------|----------|
| Fecal Coliform | 3100 | CFU/100 ml | | 1 | SM 9222D | JM | 12/19/17 |
| Total Nitrogen (NOX&TKN) | 1.34 | mg/l | | 0.1 | | | |
| Total Nitrogen (TKN) | 0.958 | mg/l | | 0.1 | SM4500N | JC | 12/29/17 |
| Nitrate + Nitrite | 0.38 | mg/l | | 0.01 | SM4500NO3 | JC | 12/27/17 |

AMTEST Identification Number 17-A022147
Client Identification TYLMI-20171219
Sampling Date 12/19/17, 08:15

Results

| PARAMETER | RESULT | UNITS | Q | D.L. | METHOD | ANALYST | DATE |
|--------------------------|--------|------------|---|------|-----------|---------|----------|
| Fecal Coliform | 1100 | CFU/100 ml | | 1 | SM 9222D | JM | 12/19/17 |
| Total Nitrogen (NOX&TKN) | 1.42 | mg/l | | 0.1 | | | |
| Total Nitrogen (TKN) | 0.971 | mg/l | | 0.1 | SM4500N | JC | 12/29/17 |
| Nitrate + Nitrite | 0.45 | mg/l | | 0.01 | SM4500NO3 | JC | 12/27/17 |

AMTEST Identification Number 17-A022148
Client Identification TYLMO-20171219
Sampling Date 12/19/17, 07:45


Results

| PARAMETER | RESULT | UNITS | Q | D.L. | METHOD | ANALYST | DATE |
|--------------------------|--------|------------|---|------|-----------|---------|----------|
| Fecal Coliform | 960 | CFU/100 ml | | 1 | SM 9222D | JM | 12/19/17 |
| Total Nitrogen (NOX&TKN) | 1.15 | mg/l | | 0.1 | | | |
| Total Nitrogen (TKN) | 0.761 | mg/l | | 0.1 | SM4500N | JC | 12/29/17 |
| Nitrate + Nitrite | 0.39 | mg/l | | 0.01 | SM4500NO3 | JC | 12/27/17 |

AMTEST Identification Number 17-A022149
Client Identification QA39-20171219
Sampling Date 12/19/17, 07:40

Results

| PARAMETER | RESULT | UNITS | Q | D.L. | METHOD | ANALYST | DATE |
|--------------------------|--------|------------|---|------|-----------|---------|----------|
| Fecal Coliform | 440 | CFU/100 ml | | 1 | SM 9222D | JM | 12/19/17 |
| Total Nitrogen (NOX&TKN) | 2.50 | mg/l | | 0.1 | | | |
| Total Nitrogen (TKN) | 1.10 | mg/l | | 0.1 | SM4500N | JC | 12/29/17 |
| Nitrate + Nitrite | 1.4 | mg/l | | 0.01 | SM4500NO3 | JC | 12/27/17 |


Aaron W. Young
Laboratory Manager

QC Summary for sample numbers: 17-A022135 to 17-A022149

DUPLICATES

| SAMPLE # | ANALYTE | UNITS | SAMPLE VALUE | DUP VALUE | RPD |
|------------|----------------------|------------|--------------|-----------|------|
| 17-A022139 | Fecal Coliform | CFU/100 ml | 530 | 430 | 21. |
| 17-A022149 | Fecal Coliform | CFU/100 ml | 440 | 420 | 4.7 |
| 17-A022184 | Fecal Coliform | CFU/100 ml | 180 | 220 | 20. |
| 17-A022024 | Total Nitrogen (TKN) | mg/l | 42.0 | 42.4 | 0.95 |
| 17-A022135 | Total Nitrogen (TKN) | mg/l | 0.670 | 0.656 | 2.1 |
| 17-A022145 | Total Nitrogen (TKN) | mg/l | 0.753 | 0.802 | 6.3 |
| 17-A022149 | Total Nitrogen (TKN) | mg/l | 1.10 | 1.20 | 8.7 |
| 17-A021951 | Nitrate + Nitrite | mg/l | 0.37 | 0.40 | 7.8 |
| 17-A022018 | Nitrate + Nitrite | mg/l | 0.040 | 0.042 | 4.9 |
| 17-A022082 | Nitrate + Nitrite | mg/l | 2.0 | 2.1 | 4.9 |
| 17-A022121 | Nitrate + Nitrite | mg/l | 0.11 | 0.10 | 9.5 |
| 17-A022167 | Nitrate + Nitrite | mg/l | 1.8 | 1.8 | 0.00 |
| 17-A022213 | Nitrate + Nitrite | mg/l | 1.4 | 1.4 | 0.00 |
| 17-A022387 | Nitrate + Nitrite | mg/l | 0.35 | 0.36 | 2.8 |
| 17-A022219 | Nitrate + Nitrite | mg/l | 1.4 | 1.6 | 13. |
| 17-A022381 | Nitrate + Nitrite | mg/l | 2.3 | 2.3 | 0.00 |
| 17-A022480 | Nitrate + Nitrite | mg/l | 0.46 | 0.50 | 8.3 |
| 17-A022490 | Nitrate + Nitrite | mg/l | 0.85 | 0.86 | 1.2 |

MATRIX SPIKES

| SAMPLE # | ANALYTE | UNITS | SAMPLE VALUE | SMPL+ SPK | SPK AMT | RECOVERY |
|------------|----------------------|-------|--------------|-----------|---------|----------|
| 17-A022024 | Total Nitrogen (TKN) | mg/l | 42.0 | 95.7 | 50.0 | 107.40 % |
| 17-A022135 | Total Nitrogen (TKN) | mg/l | 0.670 | 1.65 | 1.00 | 98.00 % |
| 17-A022145 | Total Nitrogen (TKN) | mg/l | 0.753 | 1.80 | 1.00 | 104.70 % |
| 17-A022149 | Total Nitrogen (TKN) | mg/l | 1.10 | 2.20 | 1.00 | 110.00 % |
| 17-A021951 | Nitrate + Nitrite | mg/l | 0.37 | 1.5 | 1.0 | 113.00 % |
| 17-A022018 | Nitrate + Nitrite | mg/l | 0.040 | 1.2 | 1.0 | 116.00 % |
| 17-A022082 | Nitrate + Nitrite | mg/l | 2.0 | 2.7 | 1.0 | 70.00 % |
| 17-A022121 | Nitrate + Nitrite | mg/l | 0.11 | 1.2 | 1.0 | 109.00 % |
| 17-A022167 | Nitrate + Nitrite | mg/l | 1.8 | 2.6 | 1.0 | 80.00 % |
| 17-A022213 | Nitrate + Nitrite | mg/l | 1.4 | 2.5 | 1.0 | 110.00 % |
| 17-A022387 | Nitrate + Nitrite | mg/l | 0.35 | 1.5 | 1.0 | 115.00 % |
| 17-A022381 | Nitrate + Nitrite | mg/l | 2.3 | 3.6 | 1.0 | 130.00 % |
| 17-A022480 | Nitrate + Nitrite | mg/l | 0.46 | 1.2 | 1.0 | 74.00 % |
| 17-A022490 | Nitrate + Nitrite | mg/l | 0.85 | 2.0 | 1.0 | 115.00 % |

QC Summary for sample numbers: 17-A022135 to 17-A022149...

STANDARD REFERENCE MATERIALS

| ANALYTE | UNITS | TRUE VALUE | MEASURED VALUE | RECOVERY |
|----------------------|-------|------------|----------------|----------|
| Total Nitrogen (TKN) | mg/l | 1.00 | 0.875 | 87.5 % |
| Total Nitrogen (TKN) | mg/l | 1.00 | 1.02 | 102. % |
| Nitrate + Nitrite | mg/l | 1.0 | 1.1 | 110. % |
| Nitrate + Nitrite | mg/l | 1.0 | 1.1 | 110. % |
| Nitrate + Nitrite | mg/l | 1.0 | 1.1 | 110. % |
| Nitrate + Nitrite | mg/l | 1.0 | 1.1 | 110. % |
| Nitrate + Nitrite | mg/l | 1.0 | 0.98 | 98.0 % |

BLANKS

| ANALYTE | UNITS | RESULT |
|----------------------|------------|--------|
| Fecal Coliform | CFU/100 ml | < 1 |
| Fecal Coliform | CFU/100 ml | < 1 |
| Fecal Coliform | CFU/100 ml | < 1 |
| Total Nitrogen (TKN) | mg/l | < 0.1 |
| Total Nitrogen (TKN) | mg/l | < 0.1 |
| Nitrate + Nitrite | mg/l | < 0.01 |
| Nitrate + Nitrite | mg/l | < 0.01 |
| Nitrate + Nitrite | mg/l | < 0.01 |
| Nitrate + Nitrite | mg/l | < 0.01 |
| Nitrate + Nitrite | mg/l | < 0.01 |



14648 NE 95th Street, Redmond, WA 98052 · (425) 883-3881

Laboratory: AmTest Laboratories

Attention: Aaron Young

13600 NE 126th PI Kirkland, WA 98034

Phone Number: (425) 885-1664

Turnaround Request

1 Day 2 Day 3 Day

Standard

Other: _____

Laboratory Reference #: 12-194

Project Manager: Blair Goodrow

email: bgoodrow@onsite-env.com

Project Number: 14-05806-000

Project Name: Redmond Paired Watershed Study

| Lab ID | Sample Identification | Date Sampled | Time Sampled | Matrix | # of Cont. | Requested Analyses |
|-------------------------------------|-----------------------|--------------------|--------------|----------|------------|--|
| 1 | COLM-20171219 22/35 | 12/19/17 | 1030 | Water | 2 | Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N |
| 2 | COUMI-20171219 36 | 12/19/17 | 640 | Water | 2 | Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N |
| 3 | COUMO-20171219 37 | 12/19/17 | 625 | Water | 2 | Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N |
| 4 | EVAMS-20171219 38 | 12/19/17 | 740 | Water | 2 | Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N |
| 5 | EVALSS-20171219 39 | 12/19/17 | 850 | Water | 2 | Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N |
| 6 | MONMN-20171219 40 | 12/19/17 | 830 | Water | 2 | Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N |
| 7 | MONMS-20171219 41 | 12/19/17 | 845 | Water | 2 | Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N |
| 8 | MONM-20171219 42 | 12/19/17 | 945 | Water | 2 | Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N |
| 9 | SEIMN-20171219 43 | 12/19/17 | 940 | Water | 2 | Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N |
| 10 | SEIMS-20171219 44 | 12/19/17 | 920 | Water | 2 | Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N |
| Signature | | Company | | Date | Time | Comments/Special Instructions |
| Relinquished by: <i>[Signature]</i> | | <i>[Signature]</i> | | 12/19/17 | 1125 | EDDs - CSV Reporting Limits: Fecal Coliform - 1.0 cfu/100ml Total Nitrogen - .10 mg/L |
| Received by: <i>[Signature]</i> | | T=4.0 | | 12/19/17 | 1125 | |
| Relinquished by: | | | | | | |
| Received by: | | | | | | |
| Relinquished by: | | | | | | |
| Received by: | | | | | | |

→ Fecal bottle broke, replaced bottle, halfway filled w/ sample



14648 NE 95th Street, Redmond, WA 98052 · (425) 883-3881

Laboratory: AmTest Laboratories

Attention: Aaron Young

13600 NE 126th PI Kirkland, WA 98034

Phone Number: (425) 885-1664

Turnaround Request
 1 Day 2 Day 3 Day
 Standard
 Other: _____

Laboratory Reference #: 12-194
 Project Manager: Blair Goodrow
 email: bgoodrow@onsite-env.com
 Project Number: 14-05806-000
 Project Name: Redmond Paired Watershed Study

| Lab ID | Sample Identification | Date Sampled | Time Sampled | Matrix | # of Cont. | Requested Analyses | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|-----------------------|--------------|--------------|--|------------|---|-----------|---------|------|------|-------------------------------|------------------|------------|----------|------|--|--------------|-------|----------|------|------------------|--|--|--|--------------|--|--|--|------------------|--|--|--|--------------|--|--|--|--|
| 11 | TOSMI-20171219 22145 | 12/19/17 | 640 | Water | 2 | Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 12 | TOSMO-20171219 46 | 12/19/17 | 700 | Water | 2 | Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 13 | TYLMI-20171219 47 | 12/19/17 | 815 | Water | 2 | Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 14 | TYLMO-20171219 48 | 12/19/17 | 745 | Water | 2 | Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 15 | QA39-20171219 49 | 12/19/17 | 740 | Water | 2 | Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <table border="1"> <thead> <tr> <th>Signature</th> <th>Company</th> <th>Date</th> <th>Time</th> <th>Comments/Special Instructions</th> </tr> </thead> <tbody> <tr> <td>Relinquished by: </td> <td>OnSite Inc</td> <td>12/19/17</td> <td>1125</td> <td rowspan="5"> EDDs - CSV Reporting Limits: Fecal Coliform - 1.0 cfu/100ml Total Nitrogen - .10 mg/L </td> </tr> <tr> <td>Received by: </td> <td>T=4.0</td> <td>12/19/17</td> <td>1125</td> </tr> <tr> <td>Relinquished by:</td> <td></td> <td></td> <td></td> </tr> <tr> <td>Received by:</td> <td></td> <td></td> <td></td> </tr> <tr> <td>Relinquished by:</td> <td></td> <td></td> <td></td> </tr> <tr> <td>Received by:</td> <td></td> <td></td> <td></td> <td></td> </tr> </tbody> </table> | | | | | | | Signature | Company | Date | Time | Comments/Special Instructions | Relinquished by: | OnSite Inc | 12/19/17 | 1125 | EDDs - CSV Reporting Limits: Fecal Coliform - 1.0 cfu/100ml Total Nitrogen - .10 mg/L | Received by: | T=4.0 | 12/19/17 | 1125 | Relinquished by: | | | | Received by: | | | | Relinquished by: | | | | Received by: | | | | |
| Signature | Company | Date | Time | Comments/Special Instructions | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Relinquished by: | OnSite Inc | 12/19/17 | 1125 | EDDs - CSV Reporting Limits: Fecal Coliform - 1.0 cfu/100ml Total Nitrogen - .10 mg/L | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Received by: | T=4.0 | 12/19/17 | 1125 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Relinquished by: | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Received by: | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Relinquished by: | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Received by: | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |



14648 NE 95th Street, Redmond, WA 98052
 Telephone: 425.883.3881

Company: Herrera Environmental Consultants
 Project No.: 14-05806-000
 Project Name: Redmond Paired Watershed Study
 Project Manager: George Iftner

CHAIN OF CUSTODY

12-194

Turnaround Requested:
 _____ 1 Day
 _____ 2 Day
 _____ 3 Day
 Standard

Laboratory No. _____
 Requested Analyses _____

| Total Suspended Solids (SM 2540D) | Turbidity (EPA 181.1) | Hardness (EPA 200.7 / SM 2340B) | Dissolved Organ Carbon (SM 5310B) * | Fecal Coliform (SM 9222D) | Total Phosphorus (EPA 365.1) | Total Nitrogen (SM 4500 N-B) | Total Cu and Zn (EPA 200.8) | Dissolved Cu and Zn (EPA 200.8) * |
|-----------------------------------|-----------------------|---------------------------------|-------------------------------------|---------------------------|------------------------------|------------------------------|-----------------------------|-----------------------------------|
|-----------------------------------|-----------------------|---------------------------------|-------------------------------------|---------------------------|------------------------------|------------------------------|-----------------------------|-----------------------------------|

| Lab ID | Sample Identification | Date Sampled | Time Sampled | Matrix | # of Cont. | Total Suspended Solids (SM 2540D) | Turbidity (EPA 181.1) | Hardness (EPA 200.7 / SM 2340B) | Dissolved Organ Carbon (SM 5310B) * | Fecal Coliform (SM 9222D) | Total Phosphorus (EPA 365.1) | Total Nitrogen (SM 4500 N-B) | Total Cu and Zn (EPA 200.8) | Dissolved Cu and Zn (EPA 200.8) * |
|--------|-----------------------|--------------|--------------|--------|------------|-----------------------------------|-----------------------|---------------------------------|-------------------------------------|---------------------------|------------------------------|------------------------------|-----------------------------|-----------------------------------|
| 1 | COLM-2017 1219 | 12-19-17 | 1030 | Water | 7 | X | X | X | X | X | X | X | X | X |
| 2 | COUMI-2017 1219 | | 640 | Water | 7 | X | X | X | X | X | X | X | X | X |
| 3 | COUMO-2017 1219 | | 625 | Water | 7 | X | X | X | X | X | X | X | X | X |
| 4 | EVAMS-2017 1219 | | 8740 | Water | 7 | X | X | X | X | X | X | X | X | X |
| 5 | VALSS-2017 1219 | | 850 | Water | 7 | X | X | X | X | X | X | X | X | X |
| 6 | MONMN-2017 1219 | | 830 | Water | 7 | X | X | X | X | X | X | X | X | X |
| 7 | MONMS-2017 1219 | | 845 | Water | 7 | X | X | X | X | X | X | X | X | X |
| 8 | MONM-2017 1219 | | 945 | Water | 7 | X | X | X | X | X | X | X | X | X |
| 9 | SEIMN-2017 1219 | | 940 | Water | 7 | X | X | X | X | X | X | X | X | X |
| 10 | SEIMS-2017 1219 | | 920 | Water | 7 | X | X | X | X | X | X | X | X | X |
| 11 | TOSMI-2017 1219 | | 640 | Water | 7 | X | X | X | X | X | X | X | X | X |
| 12 | TOSMO-2017 1219 | | 700 | Water | 7 | X | X | X | X | X | X | X | X | X |
| 13 | TYLMI-2017 1219 | | 815 | Water | 7 | X | X | X | X | X | X | X | X | X |
| 14 | TYLMO-2017 1219 | | 745 | Water | 7 | X | X | X | X | X | X | X | X | X |
| 15 | QA 39-2017 1219 | | 740 | Water | 7 | X | X | X | X | X | X | X | X | X |

Relinquished by M. Herrera Date 1100 Received by [Signature] Date 12/19/17
 Firm Herrera Time _____ Firm OBE Time 1100

Relinquished by _____ Date _____ Received by _____ Date _____
 Firm _____ Time _____ Firm _____ Time _____

Comments:
 * - field filtered with 0.45 µm filter within 15 minutes of collecting sample



14648 NE 95th Street, Redmond, WA 98052
 Telephone: 425.883.3881

Company: Herrera Environmental Consultants
 Project No.: 14-05806-000
 Project Name: Redmond Paired Watershed Study
 Project Manager: George Ittner

CHAIN OF CUSTODY

12-194

Turnaround Requested:

_____ 1 Day

_____ 2 Day

_____ 3 Day

Standard

Laboratory No. _____

Requested Analyses _____

| Lab ID | Sample Identification | Date Sampled | Time Sampled | Matrix | # of Cont. | Requested Analyses | | | | | | | | | | |
|--------|-----------------------|--------------|--------------|--------|------------|-----------------------------------|-----------------------|---------------------------------|-------------------------------------|---------------------------|------------------------------|------------------------------|-----------------------------|-----------------------------------|--|--|
| | | | | | | Total Suspended Solids (SM 2540D) | Turbidity (EPA 181.1) | Hardness (EPA 200.7 / SM 2340B) | Dissolved Organ Carbon (SM 5310B) * | Fecal Coliform (SM 9222D) | Total Phosphorus (EPA 365.1) | Total Nitrogen (SM 4500 N-B) | Total Cu and Zn (EPA 200.8) | Dissolved Cu and Zn (EPA 200.8) * | | |
| 1 | COLM-2017 1219 | 12-19-17 | 1030 | Water | 7 | X | X | X | X | X | X | X | X | X | | |
| 2 | COUMI-2017 1219 | | 640 | Water | 7 | X | X | X | X | X | X | X | X | X | | |
| 3 | COUMO-2017 1219 | | 625 | Water | 7 | X | X | X | X | X | X | X | X | X | | |
| 4 | EVAMS-2017 1219 | | 8740 | Water | 7 | X | X | X | X | X | X | X | X | X | | |
| 5 | EVALSS-2017 1219 | | 850 | Water | 7 | X | X | X | X | X | X | X | X | X | | |
| 6 | MONMN-2017 1219 | | 830 | Water | 7 | X | X | X | X | X | X | X | X | X | | |
| 7 | MONMS-2017 1219 | | 845 | Water | 7 | X | X | X | X | X | X | X | X | X | | |
| 8 | MONM-2017 1219 | | 945 | Water | 7 | X | X | X | X | X | X | X | X | X | | |
| 9 | SEIMN-2017 1219 | | 940 | Water | 7 | X | X | X | X | X | X | X | X | X | | |
| 10 | SEIMS-2017 1219 | | 920 | Water | 7 | X | X | X | X | X | X | X | X | X | | |
| 11 | TOSMI-2017 1219 | | 640 | Water | 7 | X | X | X | X | X | X | X | X | X | | |
| 12 | TOSMO-2017 1219 | | 700 | Water | 7 | X | X | X | X | X | X | X | X | X | | |
| 13 | TYLMI-2017 1219 | | 815 | Water | 7 | X | X | X | X | X | X | X | X | X | | |
| 14 | TYLMO-2017 1219 | | 745 | Water | 7 | X | X | X | X | X | X | X | X | X | | |
| 15 | QA 39-2017 1219 | | 740 | Water | 7 | X | X | X | X | X | X | X | X | X | | |

Relinquished by M. Mamm... Date 1100 Received by [Signature] Date 12/19/17

Firm Herrera Time _____ Firm OBE Time 1100

Relinquished by _____ Date _____ Received by _____ Date _____

Firm _____ Time _____ Firm _____ Time _____

Comments:
 * - field filtered with 0.45 µm filter within 15 minutes of collecting sample

METER CALIBRATION LOG - Redmond Paired Watershed Study

Project Number: 14-05806-000
Personnel Performing Calibration: A. SUGASEN
Meter: YSI ProDSS #1
Date/Time: 12/18/17 1200
Barometric Pressure Start of Day: mmHg: 761.8 Time: 1230
Barometric Pressure End of Day: mmHg: 745.2 Time: 12:05 12/18

Calibration Procedures:
Rinse Multimeter Sonde Between Each Operation
 Rinse 3 times with tap water, 3 times with deionized water, then 3 times with the solution to be used for calibrating or testing.
Conductivity Calibration Notes:



| PRE Field Run CALIBRATION | Meter Reading | Buffer / Cal Std | Temp °C | Comments |
|---------------------------|---------------|------------------|---------|------------------|
| Conductivity (µS/cm) | 8.1 | 0 | 22.3 | HERRERA DI WATER |
| Conductivity (µS/cm) | 999 | 1,000 | 22.4 | ✓ |
| Conductivity (µS/cm) | 100.0 | 100 | 22.3 | ✓ |
| DO % Saturation | 100.2 | 100 | 22.6 | ✓ |

1. Dry the conductivity probe with a lab tissue (e.g., KimWipes®) and DI water.
2. Fill calibration cup to within a centimeter of the top of the calibration cup with DI water (0 µS).
3. Fill the calibration cup with 1,000 µS standard so that the temperature/conductivity probe is submerged.
4. Make sure there are no bubbles in the cell; wait 2 minutes.
5. Enter the appropriate standard value (1,000 µS/cm or 1.0 mS/cm) for Sp Cond.
6. Check conductivity using 100 µS/cm standard.

| POST Field Run CHECK | Meter Reading | Buffer / Cal Std | Temp °C | Comments |
|----------------------|---------------|------------------|---------|--------------------|
| Conductivity (µS/cm) | 4.9 | 0 | 21.5 | Lab grade DI water |
| Conductivity (µS/cm) | 958 | 1000 | 22.4 | |
| DO % Saturation | 101.4 | 100 | 21.5 | |

- Dissolved Oxygen Calibration Notes:**
1. Fill the calibration cup with about 1/2 inch of DI; it should be below the sensor cap.
 2. Use KimWipes® to dry any droplets from the sensor cap.
 3. Invert calibration cup's cap and gently rest it on the cup.
 4. Wait 5 minutes, making sure that temperature stabilizes.
 5. Determine local barometric pressure (mm Hg) and enter this value into the meter.
 6. Click "Calibrate". "Calibrate Successful" will be displayed.
 7. To retain calibration accuracy between measurements, store with the sensor immersed in water or within a water-saturated air environment such as a sealed storage cup with at least 10 ml of water.
 8. It is important to have the water-saturated air and the sensor at the same temperature. Therefore, store a jar of DI in the same environment as the sonde and calibrate in a similar air temperature as the water and sonde.
 9. Keep probe out of direct sun or wind.

~~conductivity (µS/cm)~~
 conductivity (µS/cm) 99.4 100 22.5

METER CALIBRATION LOG - Redmond Paired Watershed Study



Project Number: 14-05806-000
Personnel Performing Calibration: A. SVEINASON
Meter: YSI ProDSS #2
Date/Time: 12/18/17 12:00
Barometric Pressure Start of Day: mmHg: 762.2 Time: 12:30
Barometric Pressure End of Day: mmHg: 745.8 Time: 12:05 (12/19/17)

Calibration Procedures:
Rinse Multimenter Sonde Between Each Operation
 Rinse 3 times with tap water, 3 times with deionized water, then 3 times with the solution to be used for calibrating or testing.

Conductivity Calibration Notes:

| PRE Field Run CALIBRATION | Meter Reading | Buffer / Cal Std | Temp °C | Comments |
|---------------------------|---------------|------------------|---------|-------------------------------------|
| Conductivity (µS/cm) | 8.3 | 0 | 22.5 | HERRERA DI WATER |
| Conductivity (µS/cm) | 1,007 | 1,000 | 22.5 | READS 1,000 µS/cm AFTER CALIBRATION |
| Conductivity (µS/cm) | 100.2 | 100 | 22.4 | ✓ |
| DO % Saturation | 99.8 | 100 | 23.0 | ✓ |

1. Dry the conductivity probe with a lab tissue (e.g., KimWipes®) and DI water.
2. Fill calibration cup to within a centimeter of the top of the calibration cup with DI water (0 µS).
3. Fill the calibration cup with 1,000 µS standard so that the temperature/conductivity probe is submerged.
4. Make sure there are no bubbles in the cell; wait 2 minutes.
5. Enter the appropriate standard value (1,000 µS/cm or 1.0 mS/cm) for Sp Cond.
6. Check conductivity using 100 µS/cm standard.

| POST Field Run CHECK | Meter Reading | Buffer / Cal Std | Temp °C | Comments |
|----------------------|---------------|------------------|---------|----------|
| Conductivity (µS/cm) | 3.1 | 0 | 21.9 | |
| Conductivity (µS/cm) | 971 | 1000 | 22.6 | |
| DO % Saturation | 98.1 | 100 | 21.4 | |

- Dissolved Oxygen Calibration Notes:**
1. Fill the calibration cup with about 1/2 inch of DI; it should be below the sensor cap.
 2. Use KimWipes® to dry any droplets from the sensor cap.
 3. Invert calibration cup's cap and gently rest it on the cup.
 4. Wait 5 minutes, making sure that temperature stabilizes.
 5. Determine local barometric pressure (mm Hg) and enter this value into the meter.
 6. Click "Calibrate". "Calibrate Successful" will be displayed.
 7. To retain calibration accuracy between measurements, store with the sensor immersed in water or within a water-saturated air environment such as a sealed storage cup with at least 10 ml of water.
 8. It is important to have the water-saturated air and the sensor at the same temperature. Therefore, store a jar of DI in the same environment as the sonde and calibrate in a similar air temperature as the water and sonde.
 9. Keep probe out of direct sun or wind.

Conductivity (µS/cm) 100-1 | 100 | 22.6
 DO % Saturation | 100

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: M Muller T Geisler
 Sample Date: 12-19-17 Sample Time: 10:30 PDT:
 Base Flow or Storm Event? Field Filtered Time: 10:35 PST:
 (Must filter within 15 minutes of collection)

SITE ID: COLM
 Project Number: 14-05806-000



Project Name: Redmond Paired Watershed Study

Current Weather and Temp: rainy 43°

Water Quality Sampling

Sample ID: COLM 20171219

| Parameter | Bottle Type | Bottle Volume | # Bottles | Preservative | Duplicated? |
|---------------------------|-------------|---------------|-----------|--------------------------------|-------------|
| TSS and Turbidity | HDPE | 1L | 1 | NA | |
| DOC * | HDPE | 250 ml | 1 | HCL | |
| Fecal Col. Bact. | HDPE | 250 ml | 1 | EDTA | |
| T. Phosphorous | HDPE | 250 ml | 1 | H ₂ SO ₄ | |
| T. Nitrogen | HDPE | 250 ml | 1 | H ₂ SO ₄ | |
| Diss. Cu and Zn * | HDPE | 250 ml | 1 | HNO ₃ | |
| Hardness, Total Cu and Zn | HDPE | 500 ml | 1 | HNO ₃ | |

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID: _____
 Filter blank sample ID: _____
 Transfer blank sample ID: _____

Visual and Olfactory Conditions:

Clarity: clear
 Color: none
 Odor: ✓
 Sheen: ✓
 Floatables: _____

LABORATORY DELIVERY

Date: _____ Time: _____

Quality Assurance

Checked By: J. L. ... Signature: [Signature]
 Date Checked: 2-10-18 Time: _____
 Data Entered into Database? YES NO initials: _____
 Date Entered: _____ Time: _____
 Notes: _____

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

YSI Pro Plus (15D100020) _____
 YSI Pro DSS 1 _____
 YSI Pro DSS 2 _____

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): 0.16
 Reference Point (description): SG

Water Quality Measurements

Temperature (°C) 5.4
 Specific Conductivity (µs/cm) 28.9
 Dissolved Oxygen (mg/L) 11.35

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: BBB AH
 Sample Date: 12-19-17 Sample Time: 640 PDT:
 Base Flow or Storm Event? Field Filtered Time: 645 PST:
(Must filter within 15 minutes of collection)

SITE ID: COUM1
 Project Number: 14-05806-000



Project Name: Redmond Paired Watershed Study
 Current Weather and Temp: Rain 40°F

Water Quality Sampling

Sample ID: COUM1-20171219

| Parameter | Bottle Type | Bottle Volume | # Bottles | Preservative | Duplicated? |
|---------------------------|-------------|---------------|-----------|--------------------------------|-------------|
| TSS and Turbidity | HDPE | 1L | 1 | NA | <u>N</u> |
| DOC * | HDPE | 250 ml | 1 | HCL | ↓ |
| Fecal Col. Bact. | HDPE | 250 ml | 1 | EDTA | |
| T. Phosphorous | HDPE | 250 ml | 1 | H ₂ SO ₄ | |
| T. Nitrogen | HDPE | 250 ml | 1 | H ₂ SO ₄ | |
| Diss. Cu and Zn * | HDPE | 250 ml | 1 | HNO ₃ | |
| Hardness, Total Cu and Zn | HDPE | 500 ml | 1 | HNO ₃ | |

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID: _____
 Filter blank sample ID: _____
 Transfer blank sample ID: _____

Visual and Olfactory Conditions:

Clarity: cloudy
 Color: yellow
 Odor: none
 Sheen: none
 Floatables: org debris, suspended

LABORATORY DELIVERY

Date: _____ Time: _____

Quality Assurance

Checked By: S. Leach Signature: [Signature]
 Date Checked: 2-16-18 Time: _____
 Data Entered into Database? YES NO initials: _____
 Date Entered: _____ Time: _____
 Notes: _____

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

YSI Pro Plus (15D100020) _____
 YSI Pro DSS 1 _____
 YSI Pro DSS 2

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): 2.85
 Reference Point (description): SG

Water Quality Measurements

Temperature (°C) 10.9
 Specific Conductivity (µs/cm) 105.8
 Dissolved Oxygen (mg/L) 11.94

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: BB AH
 Sample Date: 12-19-17 Sample Time: 10:25
 Base Flow or Storm Event? Storm Field Filtered Time: 10:30
 (Must filter within 15 minutes of collection)

SITE ID: COUMO
 Project Number: 14-05806-000



Project Name: Redmond Paired Watershed Study
 Current Weather and Temp: Rain @ 40°F

Water Quality Sampling

Sample ID: COUMO-20171219

| Parameter | Bottle Type | Bottle Volume | # Bottles | Preservative | Duplicated? |
|---------------------------|-------------|---------------|-----------|--------------------------------|-------------|
| TSS and Turbidity | HDPE | 1L | 1 | NA | <u>N</u> |
| DOC * | HDPE | 250 ml | 1 | HCL | <u>Y</u> |
| Fecal Col. Bact. | HDPE | 250 ml | 1 | EDTA | <u>Y</u> |
| T. Phosphorous | HDPE | 250 ml | 1 | H ₂ SO ₄ | <u>Y</u> |
| T. Nitrogen | HDPE | 250 ml | 1 | H ₂ SO ₄ | <u>Y</u> |
| Diss. Cu and Zn * | HDPE | 250 ml | 1 | HNO ₃ | <u>Y</u> |
| Hardness, Total Cu and Zn | HDPE | 500 ml | 1 | HNO ₃ | <u>Y</u> |

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID: _____
 Filter blank sample ID: _____
 Transfer blank sample ID: _____

Visual and Olfactory Conditions:

Clarity: cloudy
 Color: yellow
 Odor: none
 Sheen: _____
 Floatables: _____

LABORATORY DELIVERY

Date: _____ Time: _____

Quality Assurance

Checked By: S. Lenth Signature: [Signature]
 Date Checked: 2-16-18 Time: _____
 Data Entered into Database? YES / NO Initials: _____
 Date Entered: _____ Time: _____
 Notes: _____

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

YSI Pro Plus (15D100020) _____
 YSI Pro DSS 1 _____
 YSI Pro DSS 2 X

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): 1.101 *
 Reference Point (description): SG

**estimate - water piling - see photo*

Water Quality Measurements

Temperature (°C) 10.8
 Specific Conductivity (µs/cm) 72.9
 Dissolved Oxygen (mg/L) 11.88

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: M. Miller S. Geigel
 Sample Date: 12.19.17 Sample Time: 7:40 PDT:
 Base Flow or Storm Event? Field Filtered Time: 7:45 PST:
 (Must filter within 15 minutes of collection)

SITE ID: EVAMS
 Project Number: 14-05806-000



Project Name: Redmond Paired Watershed Study

Current Weather and Temp: raining 45°

Water Quality Sampling

Sample ID: EVAMS 20171219

| Parameter | Bottle Type | Bottle Volume | # Bottles | Preservative | Duplicated? |
|---------------------------|-------------|---------------|-----------|--------------------------------|-------------|
| TSS and Turbidity | HDPE | 1L | 1 | NA | yes |
| DOC * | HDPE | 250 ml | 1 | HCL | yes |
| Fecal Col. Bact. | HDPE | 250 ml | 1 | EDTA | yes |
| T. Phosphorous | HDPE | 250 ml | 1 | H ₂ SO ₄ | yes |
| T. Nitrogen | HDPE | 250 ml | 1 | H ₂ SO ₄ | yes |
| Diss. Cu and Zn * | HDPE | 250 ml | 1 | HNO ₃ | yes |
| Hardness, Total Cu and Zn | HDPE | 500 ml | 1 | HNO ₃ | yes |

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID: ~~QA 37 20171219~~ QA 37 20171219
 Filter blank sample ID: ~~QA 37 20171219~~
 Transfer blank sample ID: ~~QA 37 20171219~~

Visual and Olfactory Conditions:

Clarity: low turbidity
 Color: none no color
 Odor: none
 Sheen: none
 Floatables: none

LABORATORY DELIVERY

Date: _____ Time: _____

Quality Assurance

Checked By: S. Geigel Signature: _____
 Date Checked: 2-16-18 Time: _____
 Data Entered into Database? YES NO initials: _____
 Date Entered: _____ Time: _____
 Notes: _____

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

YSI Pro Plus (15D100020) _____
 YSI Pro DSS 1 _____
 YSI Pro DSS 2 _____

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): 4.08
 Reference Point (description): S 4

Water Quality Measurements

Temperature (°C) 6.6
 Specific Conductivity (µs/cm) 122.7
 Dissolved Oxygen (mg/L) 11.75

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: N Muller J Grigel
 Sample Date: 12.19.17 Sample Time: 8:30 PDT:
 Base Flow or Storm Event? Field Filtered Time: 8:30 PST:

SITE ID: EVALSS
 Project Number: 14-05806-000



Project Name: Redmond Paired Watershed Study
 Current Weather and Temp: raining 45°

Water Quality Sampling

Sample ID: EVALSS 1219

| Parameter | Bottle Type | Bottle Volume | # Bottles | Preservative | Duplicated? |
|---------------------------|-------------|---------------|-----------|--------------------------------|-------------|
| TSS and Turbidity | HDPE | 1L | 1 | NA | |
| DOC * | HDPE | 250 ml | 1 | HCL | |
| Fecal Col. Bact. | HDPE | 250 ml | 1 | EDTA | |
| T. Phosphorous | HDPE | 250 ml | 1 | H ₂ SO ₄ | |
| T. Nitrogen | HDPE | 250 ml | 1 | H ₂ SO ₄ | |
| Diss. Cu and Zn * | HDPE | 250 ml | 1 | HNO ₃ | |
| Hardness, Total Cu and Zn | HDPE | 500 ml | 1 | HNO ₃ | |

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID: _____
 Filter blank sample ID: _____
 Transfer blank sample ID: _____

Visual and Olfactory Conditions:

Clarity: turbid
 Color: brown
 Odor: none
 Sheen: none
 Floatables: none

LABORATORY DELIVERY

Date: _____ Time: _____

Quality Assurance

Checked By: J. Leuth Signature: [Signature]
 Date Checked: 2-16-18 Time: _____
 Data Entered into Database? YES NO initials: _____
 Date Entered: _____ Time: _____
 Notes: _____

Field Meter Calibration

Check which field meter was used and complete the meter calibration form
YSI Pro Plus (15D100020)
YSI Pro DSS 1
YSI Pro DSS 2

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)
 Stream Stage (ft): 2.52
 Reference Point (description): S6

Water Quality Measurements

Temperature (°C) 6.8
 Specific Conductivity (µs/cm) 109.1
 Dissolved Oxygen (mg/L) 12.07

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: BB AH
 Sample Date: 12.19.17 Sample Time: 830 PDT:
 Base Flow or Storm Event? Field Filtered Time: 835 PST:
(Must filter within 15 minutes of collection)

SITE ID: MONWMN
 Project Number: 14-05806-000



Project Name: Redmond Paired Watershed Study
 Current Weather and Temp: Rain 44°F

Water Quality Sampling

Sample ID: MONWMN-20171219

| Parameter | Bottle Type | Bottle Volume | # Bottles | Preservative | Duplicated? |
|---------------------------|-------------|---------------|-----------|--------------------------------|-------------|
| TSS and Turbidity | HDPE | 1L | 1 | NA | <u>N</u> |
| DOC * | HDPE | 250 ml | 1 | HCL | |
| Fecal Col. Bact. | HDPE | 250 ml | 1 | EDTA | |
| T. Phosphorous | HDPE | 250 ml | 1 | H ₂ SO ₄ | |
| T. Nitrogen | HDPE | 250 ml | 1 | H ₂ SO ₄ | |
| Diss. Cu and Zn * | HDPE | 250 ml | 1 | HNO ₃ | |
| Hardness, Total Cu and Zn | HDPE | 500 ml | 1 | HNO ₃ | <u>✓</u> |

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID: /
 Filter blank sample ID: /
 Transfer blank sample ID: /

Visual and Olfactory Conditions:

Clarity: cloudy
 Color: light yellow
 Odor: none
 Sheen: none
 Floatables: org debris susp sed
 LABORATORY DELIVERY

Date: _____ Time: _____

Quality Assurance

Checked By: S. Lenth Signature: [Signature]
 Date Checked: 2-16-18 Time: _____
 Data Entered into Database? YES NO initials: _____
 Date Entered: _____ Time: _____
 Notes: _____

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

YSI Pro Plus (15D100020) _____
 YSI Pro DSS 1 _____
 YSI Pro DSS 2

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): 9.02
 Reference Point (description): SG

Water Quality Measurements

Temperature (°C) 0.5
 Specific Conductivity (µs/cm) 73.0
 Dissolved Oxygen (mg/L) 11.00

206 492
9734

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: BAB AH
 Sample Date: 12-19-17 Sample Time: 845 PDT: _____
 Base Flow or Storm Event? _____ Field Filtered Time: 850 PST: X
(Must filter within 15 minutes of collection)

SITE ID: MONMS
 Project Number: 14-05806-000



Project Name: Redmond Paired Watershed Study
 Current Weather and Temp: Rain 44°F

Water Quality Sampling

Sample ID: MONMS-20171219

| Parameter | Bottle Type | Bottle Volume | # Bottles | Preservative | Duplicated? |
|---------------------------|-------------|---------------|-----------|--------------------------------|-------------|
| TSS and Turbidity | HDPE | 1L | 1 | NA | N |
| DOC * | HDPE | 250 ml | 1 | HCL | ↓ |
| Fecal Col. Bact. | HDPE | 250 ml | 1 | EDTA | |
| T. Phosphorous | HDPE | 250 ml | 1 | H ₂ SO ₄ | |
| T. Nitrogen | HDPE | 250 ml | 1 | H ₂ SO ₄ | |
| Diss. Cu and Zn * | HDPE | 250 ml | 1 | HNO ₃ | |
| Hardness, Total Cu and Zn | HDPE | 500 ml | 1 | HNO ₃ | |
| | | | | | |

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID: _____
 Filter blank sample ID: _____
 Transfer blank sample ID: _____

Visual and Olfactory Conditions:

Clarity: clear
 Color: yellow
 Odor: none
 Sheen: _____
 Floatables: _____

LABORATORY DELIVERY

Date: _____ Time: _____

Quality Assurance

Checked By: S. Lamb Signature: [Signature]
 Date Checked: 2-16-18 Time: _____
 Data Entered into Database? YES NO initials: _____
 Date Entered: _____ Time: _____
 Notes: _____

Field Meter Calibration

Check which field meter was used and complete the meter calibration form
 YSI Pro Plus (15D100020) _____
 YSI Pro DSS 1 _____
 YSI Pro DSS 2 X

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)
 Stream Stage (ft): 0.24
 Reference Point (description): vault

Water Quality Measurements

Temperature (°C) 10.4
 Specific Conductivity (µs/cm) 131.9
 Dissolved Oxygen (mg/L) 10.57

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: BB AH
 Sample Date: 12-19-17 Sample Time: 9:45 PDT:
 Base Flow or Storm Event? Field Filtered Time: 9:50 PST:
 (Must filter within 15 minutes of collection)

SITE ID: MONM
 Project Number: 14-05806-000



Project Name: Redmond Paired Watershed Study
 Current Weather and Temp: Rain 44°F

Water Quality Sampling

Sample ID: MONM-20171219

| Parameter | Bottle Type | Bottle Volume | # Bottles | Preservative | Duplicated? |
|---------------------------|-------------|---------------|-----------|--------------------------------|-------------|
| TSS and Turbidity | HDPE | 1L | 1 | NA | N |
| DOC * | HDPE | 250 ml | 1 | HCL | ↓ |
| Fecal Col. Bact. | HDPE | 250 ml | 1 | EDTA | |
| T. Phosphorous | HDPE | 250 ml | 1 | H ₂ SO ₄ | |
| T. Nitrogen | HDPE | 250 ml | 1 | H ₂ SO ₄ | |
| Diss. Cu and Zn * | HDPE | 250 ml | 1 | HNO ₃ | |
| Hardness, Total Cu and Zn | HDPE | 500 ml | 1 | HNO ₃ | |

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID: _____
 Filter blank sample ID: _____
 Transfer blank sample ID: _____

Visual and Olfactory Conditions:

Clarity: cloudy
 Color: light yellow
 Odor: none
 Sheen: none
 Floatables: org detritus suspended

LABORATORY DELIVERY

Date: _____ Time: _____

Quality Assurance

Checked By: J. Lenth Signature: [Signature]
 Date Checked: 2-16-18 Time: _____
 Data Entered into Database? YES NO initials: _____
 Date Entered: _____ Time: _____
 Notes: _____

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

YSI Pro Plus (15D100020) _____
 YSI Pro DSS 1 _____
 YSI Pro DSS 2

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): NA
 Reference Point (description): NA

Water Quality Measurements

Temperature (°C) 6.7
 Specific Conductivity (µs/cm) 95.5
 Dissolved Oxygen (mg/L) 12.06

[Handwritten mark]

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: M Mullen J Geigel

Sample Date: 12-19-17 Sample Time: 9:40 PDT:

Base Flow or Storm Event? Field Filtered Time: 9:45 PST:
 (Must filter within 15 minutes of collection)

SITE ID: SEIMN

Project Number: 14-05806-000



HERRERA

Project Name: Redmond Paired Watershed Study

Current Weather and Temp: rainy 43°

Water Quality Sampling

Sample ID: SEIMN 20171219

| Parameter | Bottle Type | Bottle Volume | # Bottles | Preservative | Duplicated? |
|---------------------------|-------------|---------------|-----------|--------------------------------|-------------|
| TSS and Turbidity | HDPE | 1L | 1 | NA | / |
| DOC * | HDPE | 250 ml | 1 | HCL | |
| Fecal Col. Bact. | HDPE | 250 ml | 1 | EDTA | |
| T. Phosphorous | HDPE | 250 ml | 1 | H ₂ SO ₄ | |
| T. Nitrogen | HDPE | 250 ml | 1 | H ₂ SO ₄ | |
| Diss. Cu and Zn * | HDPE | 250 ml | 1 | HNO ₃ | |
| Hardness, Total Cu and Zn | HDPE | 500 ml | 1 | HNO ₃ | |

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID: _____
 Filter blank sample ID: _____
 Transfer blank sample ID: _____

Visual and Olfactory Conditions:

Clarity: clear
 Color: brown
 Odor: None
 Sheen: _____
 Floatables: org debris

LABORATORY DELIVERY

Date: _____ Time: _____

Quality Assurance

Checked By: J. Lenth Signature:

Date Checked: 2-16-18 Time: _____

Data Entered into Database? YES NO initials: _____

Date Entered: _____ Time: _____

Notes: _____

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

YSI Pro Plus (15D100020) _____
 YSI Pro DSS 1 _____
 YSI Pro DSS 2 _____

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): 0.55

Reference Point (description): top of bolt

Water Quality Measurements

Temperature (°C) 5.9

Specific Conductivity (µs/cm) 42.9

Dissolved Oxygen (mg/L) 12.16

light foam

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: BBB

Sample Date: 12.19.17

Sample Time: 9:20

PDT:

SITE ID:

SEIMS

Base Flow or Storm Event? Storm

Field Filtered Time: 9:25

PST:

Project Number: 14-05806-000

(Must filter within 15 minutes of collection)



Project Name: Redmond Paired Watershed Study

Current Weather and Temp: Rain 44°F

Water Quality Sampling

Sample ID: SEIMS-20171219

| Parameter | Bottle Type | Bottle Volume | # Bottles | Preservative | Duplicated? |
|---------------------------|-------------|---------------|-----------|--------------------------------|-------------|
| TSS and Turbidity | HDPE | 1L | 1 | NA | N |
| DOC * | HDPE | 250 ml | 1 | HCL | |
| Fecal Col. Bact. | HDPE | 250 ml | 1 | EDTA | |
| T. Phosphorous | HDPE | 250 ml | 1 | H ₂ SO ₄ | |
| T. Nitrogen | HDPE | 250 ml | 1 | H ₂ SO ₄ | |
| Diss. Cu and Zn * | HDPE | 250 ml | 1 | HNO ₃ | |
| Hardness, Total Cu and Zn | HDPE | 500 ml | 1 | HNO ₃ | |

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

| | |
|---------------------------|--|
| Duplicate sample ID: | |
| Filter blank sample ID: | |
| Transfer blank sample ID: | |

Visual and Olfactory Conditions:

| | |
|-------------|----------------------|
| Clarity: | <u>clear</u> |
| Color: | <u>yellow/orange</u> |
| Odor: | <u>none</u> |
| Sheen: | <u>none</u> |
| Floatables: | <u>org debris</u> |

LABORATORY DELIVERY

Date: _____ Time: _____

Quality Assurance

Checked By: J. Landis Signature: _____

Date Checked: 2-16-18 Time: _____

Data Entered into Database? YES NO initials: _____

Date Entered: _____ Time: _____

Notes: _____

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

YSI Pro Plus (15D100020) _____

YSI Pro DSS 1 _____

YSI Pro DSS 2

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): 1.04

Reference Point (description): SG

Water Quality Measurements

Temperature (°C) 6.10

Specific Conductivity (µs/cm) 62.9

Dissolved Oxygen (mg/L) 11.16

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: M. Muller J. Geigel
 Sample Date: 12.19.17 Sample Time: 6:40 PDT:
 Base Flow or Storm (Even)? Field Filtered Time: 6:45 PST:
 (Must filter within 15 minutes of collection)

SITE ID: TOSMI
 Project Number: 14-05806-000



Project Name: Redmond Paired Watershed Study
 Current Weather and Temp: rainy 45°

Water Quality Sampling

Sample ID: TOSMI 2017 12 19

| Parameter | Bottle Type | Bottle Volume | # Bottles | Preservative | Duplicated? |
|---------------------------|-------------|---------------|-----------|--------------------------------|-------------|
| TSS and Turbidity | HDPE | 1L | 1 | NA | |
| DOC * | HDPE | 250 ml | 1 | HCL | |
| Fecal Col. Bact. | HDPE | 250 ml | 1 | EDTA | |
| T. Phosphorous | HDPE | 250 ml | 1 | H ₂ SO ₄ | |
| T. Nitrogen | HDPE | 250 ml | 1 | H ₂ SO ₄ | |
| Diss. Cu and Zn * | HDPE | 250 ml | 1 | HNO ₃ | |
| Hardness, Total Cu and Zn | HDPE | 500 ml | 1 | HNO ₃ | |

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID: _____
 Filter blank sample ID: _____
 Transfer blank sample ID: _____

Visual and Olfactory Conditions:

Clarity: turbid
 Color: brown
 Odor: none
 Sheen: none
 Floatables: none

LABORATORY DELIVERY

Date: _____ Time: _____

Quality Assurance

Checked By: J. Lenth Signature: [Signature]
 Date Checked: 2-16-18 Time: _____
 Data Entered into Database? YES NO initials: _____
 Date Entered: _____ Time: _____
 Notes: _____

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

YSI Pro Plus (15D100020) _____
 YSI Pro DSS 1 _____
 YSI Pro DSS 2

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): 1.15
 Reference Point (description): 3G

Water Quality Measurements

Temperature (°C) 61°
 Specific Conductivity (µs/cm) 47.3
 Dissolved Oxygen (mg/L) 12.31

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: BB AH
 Sample Date: 12-19-17 Sample Time: 7:00 PDT
 Base Flow or Storm Event? Field Filtered Time: 7:05 PST
 (Must filter within 15 minutes of collection)

SITE ID: TOSMO

Project Number: 14-05806-000

Project Name: Redmond Paired Watershed Study

Current Weather and Temp:



Water Quality Sampling

Sample ID: TOSMO-20171219

| Parameter | Bottle Type | Bottle Volume | # Bottles | Preservative | Duplicated? |
|---------------------------|-------------|---------------|-----------|--------------------------------|-------------------------------------|
| TSS and Turbidity | HDPE | 1L | 1 | NA | <input checked="" type="checkbox"/> |
| DOC * | HDPE | 250 ml | 1 | HCL | <input checked="" type="checkbox"/> |
| Fecal Col. Bact. | HDPE | 250 ml | 1 | EDTA | <input checked="" type="checkbox"/> |
| T. Phosphorous | HDPE | 250 ml | 1 | H ₂ SO ₄ | <input checked="" type="checkbox"/> |
| T. Nitrogen | HDPE | 250 ml | 1 | H ₂ SO ₄ | <input checked="" type="checkbox"/> |
| Diss. Cu and Zn * | HDPE | 250 ml | 1 | HNO ₃ | <input checked="" type="checkbox"/> |
| Hardness, Total Cu and Zn | HDPE | 500 ml | 1 | HNO ₃ | <input checked="" type="checkbox"/> |

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID:
 Filter blank sample ID:
 Transfer blank sample ID:

Visual and Olfactory Conditions:

Clarity: cloudy
 Color: brown
 Odor: none
 Sheen: none
 Floatables: ova debris, susp sed

LABORATORY DELIVERY

Date: Time:

Quality Assurance

Checked By: S. Lenth Signature: [Signature]
 Date Checked: 2-10-18 Time:
 Data Entered into Database? YES NO initials:
 Date Entered: Time:
 Notes:

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

YSI Pro Plus (15D100020)

YSI Pro DSS 1

YSI Pro DSS 2

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): 1.03

Reference Point (description): SG

Water Quality Measurements

Temperature (°C) 6.6

Specific Conductivity (µs/cm) 73.4

Dissolved Oxygen (mg/L) 12.15

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: BB AH

Sample Date: 12.19.17

Sample Time: 8:15

PDT:

SITE

ID:

TYLMI

Base Flow or Storm Event?

Field Filtered Time: 8:20

PST:

Project Number: 14-05806-000

(Must filter within 15 minutes of collection)

Project Name: Redmond Paired Watershed Study



Current Weather and Temp: Rain 44°F

Water Quality Sampling

Sample ID: TYLMI-20171219

| Parameter | Bottle Type | Bottle Volume | # Bottles | Preservative | Duplicated? |
|---------------------------|-------------|---------------|-----------|--------------------------------|-------------------------------------|
| TSS and Turbidity | HDPE | 1L | 1 | NA | <input checked="" type="checkbox"/> |
| DOC * | HDPE | 250 ml | 1 | HCL | <input type="checkbox"/> |
| Fecal Col. Bact. | HDPE | 250 ml | 1 | EDTA | <input type="checkbox"/> |
| T. Phosphorous | HDPE | 250 ml | 1 | H ₂ SO ₄ | <input type="checkbox"/> |
| T. Nitrogen | HDPE | 250 ml | 1 | H ₂ SO ₄ | <input type="checkbox"/> |
| Diss. Cu and Zn * | HDPE | 250 ml | 1 | HNO ₃ | <input type="checkbox"/> |
| Hardness, Total Cu and Zn | HDPE | 500 ml | 1 | HNO ₃ | <input checked="" type="checkbox"/> |

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID:

Filter blank sample ID:

Transfer blank sample ID:

Visual and Olfactory Conditions:

Clarity: cloudy
 Color: yellow
 Odor: none
 Sheen: none
 Floatables: org debris

LABORATORY DELIVERY

Date:

Time:

Quality Assurance

Checked By: S. Lenth

Signature: 

Date Checked: 2-16-18

Time:

Data Entered into Database?

YES

NO

initials:

Date Entered:

Time:

Notes:

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

YSI Pro Plus (15D100020)

YSI Pro DSS 1

YSI Pro DSS 2

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): ~~4.25~~ 4.22'

Reference Point (description): top of culvert 1

Water Quality Measurements

Temperature (°C) 6.4

Specific Conductivity (µs/cm) 82.0

Dissolved Oxygen (mg/L) 11.00

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: BB AH
 Sample Date: 12-19-17 Sample Time: 7:45 PDT:
 Base Flow or Storm Event? Storm Field Filtered Time: 7:50 AST:
(Must filter within 15 minutes of collection)

SITE ID: TYLMO

Project Number: 14-05806-000



Project Name: Redmond Paired Watershed Study

Current Weather and Temp: Rain 44°F

Water Quality Sampling

Sample ID: TYLMO-20171219

| Parameter | Bottle Type | Bottle Volume | # Bottles | Preservative | Duplicated? |
|---------------------------|-------------|---------------|-----------|--------------------------------|-------------|
| TSS and Turbidity | HDPE | 1L | 1 | NA | N |
| DOC * | HDPE | 250 ml | 1 | HCL | |
| Fecal Col. Bact. | HDPE | 250 ml | 1 | EDTA | |
| T. Phosphorous | HDPE | 250 ml | 1 | H ₂ SO ₄ | |
| T. Nitrogen | HDPE | 250 ml | 1 | H ₂ SO ₄ | |
| Diss. Cu and Zn * | HDPE | 250 ml | 1 | HNO ₃ | |
| Hardness, Total Cu and Zn | HDPE | 500 ml | 1 | HNO ₃ | |

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID: _____
 Filter blank sample ID: _____
 Transfer blank sample ID: _____

Visual and Olfactory Conditions:

Clarity: cloudy
 Color: yellow
 Odor: fish
 Sheen: none
 Floatables: org debris

LABORATORY DELIVERY

Date: _____ Time: _____

Quality Assurance

Checked By: J. Leuth Signature: _____
 Date Checked: 12-16-18 Time: _____
 Data Entered into Database? YES NO initials: _____
 Date Entered: _____ Time: _____
 Notes: _____

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

YSI Pro Plus (15D100020) _____
 YSI Pro DSS 1 _____
 YSI Pro DSS 2

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): 2.45'
 Reference Point (description): top of culvert ↓

Water Quality Measurements

Temperature (°C) 10.5
 Specific Conductivity (µs/cm) 100.0
 Dissolved Oxygen (mg/L) 11.97



HERRERA

Data Quality Assurance Worksheet

Project Name/No./Client: Redmond Paired Watershed Study / 14-05806-000 / City of Redmond

Laboratory/Parameters: OnSite Environmental : TSS, turbidity, hardness, DOC, TP, Dissolved & Total Cu, Zn / AmTest: Total nitrogen, fecal coliform bacteria

Sample Date/Sample ID: 12/19/2017 / All sites, 1 FD (QA39) at EVAMS

By G. Catarra

Date 1/9/2018 Page 1 of 2

Checked: initials
JL

date 2/6/2018

| Parameter | Completeness/ Methodology | Pre-preservation Holding Times (minutes) | | Total Holding Times (days) | | Method Blanks Reporting Limit | Matrix Spikes/ Surrogate Recovery (%) | | Lab Control Samples Recovery (%) | | Lab Duplicates RPD (%) | | Field Duplicates RPD (%) | | Instrument Calibration/ Performance | ACTION |
|-------------------------------------|------------------------------|--|------|-------------------------------|------|--|---|-------------------|--|-------------------|---------------------------|-------------------|-----------------------------|-------------------|---|-----------------------------|
| | | Reported | Goal | Reported | Goal | | Reported | Goal ¹ | Reported | Goal ¹ | Reported | Goal ¹ | Reported | Goal ¹ | | |
| TSS | OK / SM 2540D | NA | NA | 2 | ≤7 | ≤1.0 mg/L 1.0 mg/L | NA | NA | 89 | ±20 | 15 | ≤25 | 10 | ≤25 | OK | NONE |
| Turbidity | OK / EPA 180.1 | NA | NA | 1 | ≤2 | ≤0.1 NTU 0.1 NTU | NA | NA | NA | ±10 | 1 | ≤25 | 63 | ≤25 | OK | FLAG EVAMS DUE TO FD RPD |
| Hardness | OK / SM 2340B | NA | NA | 2 | ≤180 | ≤1.0 mg/L 1.0 mg/L | 108,104 | ±25 | 96 | ±15 | 1 | ≤20 | 7.6 | ≤20 | OK | NONE |
| DOC | OK / SM 5310B | <15 | ≤15 | 9 | ≤28 | ≤1.0 mg/L 1.0 mg/L | 98 | ±25 | 101 | ±15 | 0 | ≤20 | 0 | ≤20 | OK | NONE |
| Total Phosphorus | OK / EPA 365.1 | NA | NA | 14 | ≤28 | ≤0.01 mg/L 0.01 mg/L | 97 | ±25 | 101 | ±20 | NC | ≤20 | 30 | ≤20 | OK | FLAG EVAMS DUE TO FD RPD |
| Total Nitrogen (TKN + N+N) | OK/ SM 4500 N-B | NA | NA | 8,10 | ≤28 | ≤0.1 mg/L 0.1 mg/L | 98,104 | ±25 | 88-110 | ±20 | 2.1,6.3 | ≤20 | 8.7, 15 | ≤20 | OK | NONE |

¹ If the sample or duplicate value is less than five times the reporting limit, the difference is calculated rather than the relative percent difference (RPD). The QA goal is a difference <2 times the detection limit instead of the number indicated in the goal column.

NA – not applicable or not available; NC – not calculable due to one or more values below the detection limit; NS – field duplicate not sampled.



Data Quality Assurance Worksheet

By G. Catarra

Project Name/No./Client: Redmond Paired Watershed Study / 14-05806-000 / City of Redmond

Date 1/09/2018 Page 2 of 2

Laboratory/Parameters: OnSite Environmental : TSS, turbidity, hardness, DOC, TP, Dissolved & Total Cu, Zn / AmTest: total nitrogen, fecal coliform bacteria

Checked: initials
JL

Sample Date/Sample ID: 12/19/2017 / All sites, 1 FD (QA39) at EVAMS

date 2/6/2018

| Parameter | Completeness/ Methodology | Pre-preservation Holding Times (minutes) | | Total Holding Times (days) | | Method Blanks Reporting Limit | Matrix Spikes/ Surrogate Recovery (%) | | Lab Control Samples Recovery (%) | | Lab Duplicates RPD (%) | | Field Duplicates RPD (%) | | Instrument Calibration/ Performance | ACTION |
|------------------|------------------------------|--|------|-------------------------------|------|--|---|-------------------|--|------|---------------------------|-------------------|-----------------------------|-------------------|---|--------|
| | | Reported | Goal | Reported | Goal | | Reported | Goal ¹ | Reported | Goal | Reported | Goal ¹ | Reported | Goal ¹ | | |
| Total Copper | OK/ EPA 200.8 | NA | NA | 14 | ≤180 | ≤1.0 µg/L 1.0 µg/L | 107,110 | ±25 | NR | ±15 | NC | ≤20 | 0 | ≤20 | OK | NONE |
| Total Zinc | OK/ EPA 200.8 | NA | NA | 14 | ≤180 | ≤5.0 µg/L 5.0 µg/L | 109,116 | ±25 | NR | ±15 | NC | ≤20 | D=0.6 | ≤20 | OK | NONE |
| Dissolved Copper | OK/ EPA 200.8 | <15 | ≤15 | 14 | ≤180 | ≤1.0 µg/L 1.0 µg/L | 94,94 | ±25 | NR | ±15 | 2 | ≤20 | D=0.8 | ≤20 | OK | NONE |
| Dissolved Zinc | OK/ EPA 200.8 | <15 | ≤15 | 14 | ≤180 | ≤5.0 µg/L 5.0 µg/L | 106,105 | ±25 | NR | ±15 | NC | ≤20 | NC | ≤20 | OK | NONE |
| Fecal Coliform | OK/ SM 9222D | NA | NA | <1 | ≤1 | ≤1.0 cfu/ 100mL 10 cfu/ 100mL | NA | NA | NA | NA | 21,47 | ≤35 | 44 | ≤50 | OK | NONE |

¹ If the sample or duplicate value is less than five times the reporting limit, the difference is calculated rather than the relative percent difference (RPD). The QA goal is a difference <2 times the detection limit instead of the number indicated in the goal column.

NA – not applicable or not available; NC – not calculable due to one or more values below the detection limit; NS – field duplicate not sampled.



14648 NE 95th Street, Redmond, WA 98052 • (425) 883-3881

January 30, 2018

George Iftner
Herrera Environmental Consultants, Inc.
2200 6th Avenue, Suite 1100
Seattle, WA 98121

Re: Analytical Data for Project 14-05806-000
Laboratory Reference No. 1801-103

Dear George:

Enclosed are the analytical results and associated quality control data for samples submitted on January 11, 2018.

The standard policy of OnSite Environmental, Inc. is to store your samples for 30 days from the date of receipt. If you require longer storage, please contact the laboratory.

We appreciate the opportunity to be of service to you on this project. If you have any questions concerning the data, or need additional information, please feel free to call me.

Sincerely,

A handwritten signature in black ink, appearing to read "Blair Goodrow", enclosed within a large, loopy, circular scribble.

Blair Goodrow
Project Manager

Enclosures



Date of Report: January 30, 2018
Samples Submitted: January 11, 2018
Laboratory Reference: 1801-103
Project: 14-05806-000

Case Narrative

Samples were collected on January 11, 2018 and received by the laboratory on January 11, 2018. They were maintained at the laboratory at a temperature of 2°C to 6°C.

Please note that any and all soil sample results are reported on a dry-weight basis, unless otherwise noted below.

General QA/QC issues associated with the analytical data enclosed in this laboratory report will be indicated with a reference to a comment or explanation on the Data Qualifier page. More complex and involved QA/QC issues will be discussed in detail below.



Date of Report: January 30, 2018
 Samples Submitted: January 11, 2018
 Laboratory Reference: 1801-103
 Project: 14-05806-000

**TOTAL SUSPENDED SOLIDS
 SM 2540D**

Matrix: Water
 Units: mg/L

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|------------------------|----------------------|-----|----------|---------------|---------------|-------|
| Client ID: | COLM-20180111 | | | | | |
| Laboratory ID: | 01-103-01 | | | | | |
| Total Suspended Solids | 17 | 1.0 | SM 2540D | 1-16-18 | 1-16-18 | |

| | | | | | | |
|------------------------|-----------------------|-----|----------|---------|---------|--|
| Client ID: | COUMI-20180111 | | | | | |
| Laboratory ID: | 01-103-02 | | | | | |
| Total Suspended Solids | 33 | 1.0 | SM 2540D | 1-16-18 | 1-16-18 | |

| | | | | | | |
|------------------------|-----------------------|-----|----------|---------|---------|--|
| Client ID: | COUMO-20180111 | | | | | |
| Laboratory ID: | 01-103-03 | | | | | |
| Total Suspended Solids | 15 | 1.0 | SM 2540D | 1-16-18 | 1-16-18 | |

| | | | | | | |
|------------------------|-----------------------|-----|----------|---------|---------|--|
| Client ID: | EVAMS-20180111 | | | | | |
| Laboratory ID: | 01-103-04 | | | | | |
| Total Suspended Solids | 11 | 1.0 | SM 2540D | 1-16-18 | 1-16-18 | |

| | | | | | | |
|------------------------|------------------------|-----|----------|---------|---------|--|
| Client ID: | EVALSS-20180111 | | | | | |
| Laboratory ID: | 01-103-05 | | | | | |
| Total Suspended Solids | 30 | 1.0 | SM 2540D | 1-16-18 | 1-16-18 | |

| | | | | | | |
|------------------------|-----------------------|-----|----------|---------|---------|--|
| Client ID: | MONMN-20180111 | | | | | |
| Laboratory ID: | 01-103-06 | | | | | |
| Total Suspended Solids | 22 | 1.0 | SM 2540D | 1-16-18 | 1-16-18 | |

| | | | | | | |
|------------------------|-----------------------|-----|----------|---------|---------|--|
| Client ID: | MONMS-20180111 | | | | | |
| Laboratory ID: | 01-103-07 | | | | | |
| Total Suspended Solids | 6.6 | 1.0 | SM 2540D | 1-16-18 | 1-16-18 | |



Date of Report: January 30, 2018
 Samples Submitted: January 11, 2018
 Laboratory Reference: 1801-103
 Project: 14-05806-000

**TOTAL SUSPENDED SOLIDS
 SM 2540D**

Matrix: Water
 Units: mg/L

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|------------------------|----------------------|-----|----------|---------------|---------------|-------|
| Client ID: | MONM-20180111 | | | | | |
| Laboratory ID: | 01-103-08 | | | | | |
| Total Suspended Solids | 25 | 1.0 | SM 2540D | 1-16-18 | 1-16-18 | |

| | | | | | | |
|------------------------|-----------------------|-----|----------|---------|---------|--|
| Client ID: | SEIMN-20180111 | | | | | |
| Laboratory ID: | 01-103-09 | | | | | |
| Total Suspended Solids | 130 | 1.7 | SM 2540D | 1-16-18 | 1-16-18 | |

| | | | | | | |
|------------------------|-----------------------|-----|----------|---------|---------|--|
| Client ID: | SEIMS-20180111 | | | | | |
| Laboratory ID: | 01-103-10 | | | | | |
| Total Suspended Solids | 40 | 1.0 | SM 2540D | 1-16-18 | 1-16-18 | |

| | | | | | | |
|------------------------|-----------------------|-----|----------|---------|---------|--|
| Client ID: | TOSMI-20180111 | | | | | |
| Laboratory ID: | 01-103-11 | | | | | |
| Total Suspended Solids | 35 | 1.0 | SM 2540D | 1-16-18 | 1-16-18 | |

| | | | | | | |
|------------------------|-----------------------|-----|----------|---------|---------|--|
| Client ID: | TOSMO-20180111 | | | | | |
| Laboratory ID: | 01-103-12 | | | | | |
| Total Suspended Solids | 41 | 1.0 | SM 2540D | 1-16-18 | 1-16-18 | |

| | | | | | | |
|------------------------|-----------------------|-----|----------|---------|---------|--|
| Client ID: | TYLMI-20180111 | | | | | |
| Laboratory ID: | 01-103-13 | | | | | |
| Total Suspended Solids | 9.6 | 1.0 | SM 2540D | 1-16-18 | 1-16-18 | |

| | | | | | | |
|------------------------|-----------------------|-----|----------|---------|---------|--|
| Client ID: | TYLMO-20180111 | | | | | |
| Laboratory ID: | 01-103-14 | | | | | |
| Total Suspended Solids | 20 | 1.0 | SM 2540D | 1-16-18 | 1-16-18 | |



Date of Report: January 30, 2018
Samples Submitted: January 11, 2018
Laboratory Reference: 1801-103
Project: 14-05806-000

**TOTAL SUSPENDED SOLIDS
SM 2540D**

Matrix: Water
Units: mg/L

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|------------------------|-----------------------|------------|---------------|----------------------|----------------------|--------------|
| Client ID: | QA-40-20180111 | | | | | |
| Laboratory ID: | 01-103-15 | | | | | |
| Total Suspended Solids | 40 | 1.0 | SM 2540D | 1-16-18 | 1-16-18 | |



Date of Report: January 30, 2018
 Samples Submitted: January 11, 2018
 Laboratory Reference: 1801-103
 Project: 14-05806-000

**TOTAL SUSPENDED SOLIDS
 SM 2540D
 QUALITY CONTROL**

Matrix: Water
 Units: mg/L

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|------------------------|-----------|-----|----------|---------------|---------------|-------|
| METHOD BLANK | | | | | | |
| Laboratory ID: | MB0116W1 | | | | | |
| Total Suspended Solids | ND | 1.0 | SM 2540D | 1-16-18 | 1-16-18 | |

| Analyte | Result | Spike Level | Source Result | Percent Recovery | Recovery Limits | RPD | RPD Limit | Flags |
|------------------------|-------------|-------------|---------------|------------------|-----------------|-----|-----------|-------|
| DUPLICATE | | | | | | | | |
| Laboratory ID: | 01-103-06 | | | | | | | |
| | ORIG | DUP | | | | | | |
| Total Suspended Solids | 21.8 | 19.0 | NA | NA | NA | NA | 14 | 17 |

| | | | | | | | | |
|------------------------|-------------|-----|----|----|--------|----|----|--|
| SPIKE BLANK | | | | | | | | |
| Laboratory ID: | SB0116W1 | | | | | | | |
| | SB | SB | | SB | | | | |
| Total Suspended Solids | 94.0 | 100 | NA | 94 | 76-114 | NA | NA | |



Date of Report: January 30, 2018
 Samples Submitted: January 11, 2018
 Laboratory Reference: 1801-103
 Project: 14-05806-000

TURBIDITY
EPA 180.1

Matrix: Water
 Units: NTU

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|-------------------|----------------------|------|-----------|---------------|---------------|-------|
| Client ID: | COLM-20180111 | | | | | |
| Laboratory ID: | 01-103-01 | | | | | |
| Turbidity | 1.3 | 0.10 | EPA 180.1 | 1-12-18 | 1-12-18 | |

| | | | | | | |
|-------------------|-----------------------|------|-----------|---------|---------|--|
| Client ID: | COUMI-20180111 | | | | | |
| Laboratory ID: | 01-103-02 | | | | | |
| Turbidity | 5.7 | 0.10 | EPA 180.1 | 1-12-18 | 1-12-18 | |

| | | | | | | |
|-------------------|-----------------------|------|-----------|---------|---------|--|
| Client ID: | COUMO-20180111 | | | | | |
| Laboratory ID: | 01-103-03 | | | | | |
| Turbidity | 6.3 | 0.10 | EPA 180.1 | 1-12-18 | 1-12-18 | |

| | | | | | | |
|-------------------|-----------------------|------|-----------|---------|---------|--|
| Client ID: | EVAMS-20180111 | | | | | |
| Laboratory ID: | 01-103-04 | | | | | |
| Turbidity | 2.8 | 0.10 | EPA 180.1 | 1-12-18 | 1-12-18 | |

| | | | | | | |
|-------------------|------------------------|------|-----------|---------|---------|--|
| Client ID: | EVALSS-20180111 | | | | | |
| Laboratory ID: | 01-103-05 | | | | | |
| Turbidity | 8.9 | 0.10 | EPA 180.1 | 1-12-18 | 1-12-18 | |

| | | | | | | |
|-------------------|-----------------------|------|-----------|---------|---------|--|
| Client ID: | MONMN-20180111 | | | | | |
| Laboratory ID: | 01-103-06 | | | | | |
| Turbidity | 11 | 0.10 | EPA 180.1 | 1-12-18 | 1-12-18 | |

| | | | | | | |
|-------------------|-----------------------|------|-----------|---------|---------|--|
| Client ID: | MONMS-20180111 | | | | | |
| Laboratory ID: | 01-103-07 | | | | | |
| Turbidity | 4.5 | 0.10 | EPA 180.1 | 1-12-18 | 1-12-18 | |



Date of Report: January 30, 2018
 Samples Submitted: January 11, 2018
 Laboratory Reference: 1801-103
 Project: 14-05806-000

TURBIDITY
EPA 180.1

Matrix: Water
 Units: NTU

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|-------------------|----------------------|------|-----------|---------------|---------------|-------|
| Client ID: | MONM-20180111 | | | | | |
| Laboratory ID: | 01-103-08 | | | | | |
| Turbidity | 12 | 0.10 | EPA 180.1 | 1-12-18 | 1-12-18 | |

| | | | | | | |
|-------------------|-----------------------|------|-----------|---------|---------|--|
| Client ID: | SEIMN-20180111 | | | | | |
| Laboratory ID: | 01-103-09 | | | | | |
| Turbidity | 33 | 0.10 | EPA 180.1 | 1-12-18 | 1-12-18 | |

| | | | | | | |
|-------------------|-----------------------|------|-----------|---------|---------|--|
| Client ID: | SEIMS-20180111 | | | | | |
| Laboratory ID: | 01-103-10 | | | | | |
| Turbidity | 7.0 | 0.10 | EPA 180.1 | 1-12-18 | 1-12-18 | |

| | | | | | | |
|-------------------|-----------------------|------|-----------|---------|---------|--|
| Client ID: | TOSMI-20180111 | | | | | |
| Laboratory ID: | 01-103-11 | | | | | |
| Turbidity | 7.1 | 0.10 | EPA 180.1 | 1-12-18 | 1-12-18 | |

| | | | | | | |
|-------------------|-----------------------|------|-----------|---------|---------|--|
| Client ID: | TOSMO-20180111 | | | | | |
| Laboratory ID: | 01-103-12 | | | | | |
| Turbidity | 9.1 | 0.10 | EPA 180.1 | 1-12-18 | 1-12-18 | |

| | | | | | | |
|-------------------|-----------------------|------|-----------|---------|---------|--|
| Client ID: | TYLMI-20180111 | | | | | |
| Laboratory ID: | 01-103-13 | | | | | |
| Turbidity | 5.6 | 0.10 | EPA 180.1 | 1-12-18 | 1-12-18 | |

| | | | | | | |
|-------------------|-----------------------|------|-----------|---------|---------|--|
| Client ID: | TYLMO-20180111 | | | | | |
| Laboratory ID: | 01-103-14 | | | | | |
| Turbidity | 5.2 | 0.10 | EPA 180.1 | 1-12-18 | 1-12-18 | |



Date of Report: January 30, 2018
Samples Submitted: January 11, 2018
Laboratory Reference: 1801-103
Project: 14-05806-000

TURBIDITY
EPA 180.1

Matrix: Water
Units: NTU

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|-------------------|-----------------------|------------|---------------|----------------------|----------------------|--------------|
| Client ID: | QA-40-20180111 | | | | | |
| Laboratory ID: | 01-103-15 | | | | | |
| Turbidity | 8.8 | 0.10 | EPA 180.1 | 1-12-18 | 1-12-18 | |



Date of Report: January 30, 2018
 Samples Submitted: January 11, 2018
 Laboratory Reference: 1801-103
 Project: 14-05806-000

**TURBIDITY
 EPA 180.1
 QUALITY CONTROL**

Matrix: Water
 Units: NTU

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|---------------------|-----------|------|-----------|---------------|---------------|-------|
| METHOD BLANK | | | | | | |
| Laboratory ID: | MB0112W1 | | | | | |
| Turbidity | ND | 0.10 | EPA 180.1 | 1-12-18 | 1-12-18 | |

| Analyte | Result | Spike Level | Source Result | Percent Recovery | Recovery Limits | RPD | RPD Limit | Flags |
|------------------|-------------|-------------|---------------|------------------|-----------------|-----|-----------|-------|
| DUPLICATE | | | | | | | | |
| Laboratory ID: | 01-103-01 | | | | | | | |
| | ORIG | DUP | | | | | | |
| Turbidity | 1.25 | 1.26 | NA | NA | NA | NA | 1 | 15 |



Date of Report: January 30, 2018
 Samples Submitted: January 11, 2018
 Laboratory Reference: 1801-103
 Project: 14-05806-000

HARDNESS
EPA 200.7/SM 2340B

Matrix: Water
 Units: mg eqt. CaCO₃/L (ppm)

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|-------------------|----------------------|-----|----------------|---------------|---------------|-------|
| Client ID: | COLM-20180111 | | | | | |
| Laboratory ID: | 01-103-01 | | | | | |
| Hardness | 7.8 | 1.0 | 200.7/SM 2340B | 1-18-18 | 1-18-18 | |

| | | | | | | |
|-------------------|-----------------------|-----|----------------|---------|---------|--|
| Client ID: | COUMI-20180111 | | | | | |
| Laboratory ID: | 01-103-02 | | | | | |
| Hardness | 60 | 1.0 | 200.7/SM 2340B | 1-18-18 | 1-18-18 | |

| | | | | | | |
|-------------------|-----------------------|-----|----------------|---------|---------|--|
| Client ID: | COUMO-20180111 | | | | | |
| Laboratory ID: | 01-103-03 | | | | | |
| Hardness | 51 | 1.0 | 200.7/SM 2340B | 1-18-18 | 1-18-18 | |

| | | | | | | |
|-------------------|-----------------------|-----|----------------|---------|---------|--|
| Client ID: | EVAMS-20180111 | | | | | |
| Laboratory ID: | 01-103-04 | | | | | |
| Hardness | 61 | 1.0 | 200.7/SM 2340B | 1-18-18 | 1-18-18 | |

| | | | | | | |
|-------------------|------------------------|-----|----------------|---------|---------|--|
| Client ID: | EVALSS-20180111 | | | | | |
| Laboratory ID: | 01-103-05 | | | | | |
| Hardness | 53 | 1.0 | 200.7/SM 2340B | 1-18-18 | 1-18-18 | |

| | | | | | | |
|-------------------|-----------------------|-----|----------------|---------|---------|--|
| Client ID: | MONMN-20180111 | | | | | |
| Laboratory ID: | 01-103-06 | | | | | |
| Hardness | 45 | 1.0 | 200.7/SM 2340B | 1-18-18 | 1-18-18 | |

| | | | | | | |
|-------------------|-----------------------|-----|----------------|---------|---------|--|
| Client ID: | MONMS-20180111 | | | | | |
| Laboratory ID: | 01-103-07 | | | | | |
| Hardness | 60 | 1.0 | 200.7/SM 2340B | 1-18-18 | 1-18-18 | |



Date of Report: January 30, 2018
 Samples Submitted: January 11, 2018
 Laboratory Reference: 1801-103
 Project: 14-05806-000

HARDNESS
EPA 200.7/SM 2340B

Matrix: Water
 Units: mg eqt. CaCO₃/L (ppm)

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|-------------------|----------------------|-----|----------------|---------------|---------------|-------|
| Client ID: | MONM-20180111 | | | | | |
| Laboratory ID: | 01-103-08 | | | | | |
| Hardness | 19 | 1.0 | 200.7/SM 2340B | 1-18-18 | 1-18-18 | |

| | | | | | | |
|-------------------|-----------------------|-----|----------------|---------|---------|--|
| Client ID: | SEIMN-20180111 | | | | | |
| Laboratory ID: | 01-103-09 | | | | | |
| Hardness | 19 | 1.0 | 200.7/SM 2340B | 1-18-18 | 1-18-18 | |

| | | | | | | |
|-------------------|-----------------------|-----|----------------|---------|---------|--|
| Client ID: | SEIMS-20180111 | | | | | |
| Laboratory ID: | 01-103-10 | | | | | |
| Hardness | 9.1 | 1.0 | 200.7/SM 2340B | 1-18-18 | 1-18-18 | |

| | | | | | | |
|-------------------|-----------------------|-----|----------------|---------|---------|--|
| Client ID: | TOSMI-20180111 | | | | | |
| Laboratory ID: | 01-103-11 | | | | | |
| Hardness | 30 | 1.0 | 200.7/SM 2340B | 1-18-18 | 1-18-18 | |

| | | | | | | |
|-------------------|-----------------------|-----|----------------|---------|---------|--|
| Client ID: | TOSMO-20180111 | | | | | |
| Laboratory ID: | 01-103-12 | | | | | |
| Hardness | 44 | 1.0 | 200.7/SM 2340B | 1-18-18 | 1-18-18 | |

| | | | | | | |
|-------------------|-----------------------|-----|----------------|---------|---------|--|
| Client ID: | TYLMI-20180111 | | | | | |
| Laboratory ID: | 01-103-13 | | | | | |
| Hardness | 35 | 1.0 | 200.7/SM 2340B | 1-18-18 | 1-18-18 | |

| | | | | | | |
|-------------------|-----------------------|-----|----------------|---------|---------|--|
| Client ID: | TYLMO-20180111 | | | | | |
| Laboratory ID: | 01-103-14 | | | | | |
| Hardness | 29 | 1.0 | 200.7/SM 2340B | 1-18-18 | 1-18-18 | |



Date of Report: January 30, 2018
Samples Submitted: January 11, 2018
Laboratory Reference: 1801-103
Project: 14-05806-000

HARDNESS
EPA 200.7/SM 2340B

Matrix: Water
Units: mg eqt. CaCO₃/L (ppm)

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|-------------------|-----------------------|------------|----------------|----------------------|----------------------|--------------|
| Client ID: | QA-40-20180111 | | | | | |
| Laboratory ID: | 01-103-15 | | | | | |
| Hardness | 43 | 1.0 | 200.7/SM 2340B | 1-18-18 | 1-18-18 | |



Date of Report: January 30, 2018
 Samples Submitted: January 11, 2018
 Laboratory Reference: 1801-103
 Project: 14-05806-000

HARDNESS
EPA 200.7/SM 2340B
QUALITY CONTROL

Matrix: Water
 Units: mg eqt. CaCO₃/L (ppm)

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|---------------------|-----------|-----|----------------|---------------|---------------|-------|
| METHOD BLANK | | | | | | |
| Laboratory ID: | MB0118WH1 | | | | | |
| Hardness | ND | 1.0 | 200.7/SM 2340B | 1-18-18 | 1-18-18 | |

| Analyte | Result | Spike Level | Source Result | Percent Recovery | Recovery Limits | RPD | RPD Limit | Flags |
|------------------|-------------|-------------|---------------|------------------|-----------------|-----|-----------|-------|
| DUPLICATE | | | | | | | | |
| Laboratory ID: | 01-103-01 | | | | | | | |
| | ORIG | DUP | | | | | | |
| Hardness | 7.78 | 7.57 | NA | NA | NA | 3 | 20 | |

| Analyte | Result | Spike Level | Source Result | Percent Recovery | Recovery Limits | RPD | RPD Limit | Flags | | |
|----------------------|------------|-------------|---------------|------------------|-----------------|-----|-----------|--------|---|----|
| MATRIX SPIKES | | | | | | | | | | |
| Laboratory ID: | 01-103-01 | | | | | | | | | |
| | MS | MSD | MS | MSD | MS | MSD | | | | |
| Hardness | 142 | 138 | 132 | 132 | 7.78 | 102 | 99 | 75-125 | 3 | 20 |

| Analyte | Result | Spike Level | Source Result | Percent Recovery | Recovery Limits | RPD | RPD Limit | Flags |
|--------------------|------------|-------------|---------------|------------------|-----------------|-----|-----------|-------|
| SPIKE BLANK | | | | | | | | |
| Laboratory ID: | SB0118WH1 | | | | | | | |
| | SB | SB | | | SB | | | |
| Hardness | 133 | 132 | NA | 101 | 80-120 | NA | NA | |



Date of Report: January 30, 2018
 Samples Submitted: January 11, 2018
 Laboratory Reference: 1801-103
 Project: 14-05806-000

**DISSOLVED ORGANIC CARBON
 SM 5310B**

Matrix: Water
 Units: mg/L

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|--------------------------|------------------------|-----|----------|---------------|---------------|-------|
| Client ID: | COLM-20180111 | | | | | |
| Laboratory ID: | 01-103-01 | | | | | |
| Dissolved Organic Carbon | 11 | 1.0 | SM 5310B | 1-17-18 | 1-17-18 | |
| Client ID: | COUMI-20180111 | | | | | |
| Laboratory ID: | 01-103-02 | | | | | |
| Dissolved Organic Carbon | 5.0 | 1.0 | SM 5310B | 1-17-18 | 1-17-18 | |
| Client ID: | COUMO-20180111 | | | | | |
| Laboratory ID: | 01-103-03 | | | | | |
| Dissolved Organic Carbon | 4.3 | 1.0 | SM 5310B | 1-17-18 | 1-17-18 | |
| Client ID: | EVAMS-20180111 | | | | | |
| Laboratory ID: | 01-103-04 | | | | | |
| Dissolved Organic Carbon | 6.8 | 1.0 | SM 5310B | 1-17-18 | 1-17-18 | |
| Client ID: | EVALSS-20180111 | | | | | |
| Laboratory ID: | 01-103-05 | | | | | |
| Dissolved Organic Carbon | 7.2 | 1.0 | SM 5310B | 1-17-18 | 1-17-18 | |
| Client ID: | MONMN-20180111 | | | | | |
| Laboratory ID: | 01-103-06 | | | | | |
| Dissolved Organic Carbon | 5.2 | 1.0 | SM 5310B | 1-17-18 | 1-17-18 | |
| Client ID: | MONMS-20180111 | | | | | |
| Laboratory ID: | 01-103-07 | | | | | |
| Dissolved Organic Carbon | 5.6 | 1.0 | SM 5310B | 1-17-18 | 1-17-18 | |



Date of Report: January 30, 2018
 Samples Submitted: January 11, 2018
 Laboratory Reference: 1801-103
 Project: 14-05806-000

**DISSOLVED ORGANIC CARBON
 SM 5310B**

Matrix: Water
 Units: mg/L

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|--------------------------|-----------------------|-----|----------|---------------|---------------|-------|
| Client ID: | MONM-20180111 | | | | | |
| Laboratory ID: | 01-103-08 | | | | | |
| Dissolved Organic Carbon | 5.6 | 1.0 | SM 5310B | 1-17-18 | 1-17-18 | |
| Client ID: | SEIMN-20180111 | | | | | |
| Laboratory ID: | 01-103-09 | | | | | |
| Dissolved Organic Carbon | 7.9 | 1.0 | SM 5310B | 1-17-18 | 1-17-18 | |
| Client ID: | SEIMS-20180111 | | | | | |
| Laboratory ID: | 01-103-10 | | | | | |
| Dissolved Organic Carbon | 8.0 | 1.0 | SM 5310B | 1-17-18 | 1-17-18 | |
| Client ID: | TOSMI-20180111 | | | | | |
| Laboratory ID: | 01-103-11 | | | | | |
| Dissolved Organic Carbon | 3.5 | 1.0 | SM 5310B | 1-17-18 | 1-17-18 | |
| Client ID: | TOSMO-20180111 | | | | | |
| Laboratory ID: | 01-103-12 | | | | | |
| Dissolved Organic Carbon | 4.3 | 1.0 | SM 5310B | 1-17-18 | 1-17-18 | |
| Client ID: | TYLMI-20180111 | | | | | |
| Laboratory ID: | 01-103-13 | | | | | |
| Dissolved Organic Carbon | 6.3 | 1.0 | SM 5310B | 1-17-18 | 1-17-18 | |
| Client ID: | TYLMO-20180111 | | | | | |
| Laboratory ID: | 01-103-14 | | | | | |
| Dissolved Organic Carbon | 4.1 | 1.0 | SM 5310B | 1-17-18 | 1-17-18 | |



Date of Report: January 30, 2018
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Laboratory Reference: 1801-103
Project: 14-05806-000

**DISSOLVED ORGANIC CARBON
SM 5310B**

Matrix: Water
Units: mg/L

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|--------------------------|-----------------------|------------|---------------|----------------------|----------------------|--------------|
| Client ID: | QA-40-20180111 | | | | | |
| Laboratory ID: | 01-103-15 | | | | | |
| Dissolved Organic Carbon | 4.2 | 1.0 | SM 5310B | 1-17-18 | 1-17-18 | |



Date of Report: January 30, 2018
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 Project: 14-05806-000

**DISSOLVED ORGANIC CARBON
 SM 5310B
 QUALITY CONTROL**

Matrix: Water
 Units: mg/L

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|--------------------------|-----------|-----|----------|---------------|---------------|-------|
| METHOD BLANK | | | | | | |
| Laboratory ID: | MB0117D1 | | | | | |
| Dissolved Organic Carbon | ND | 1.0 | SM 5310B | 1-17-18 | 1-17-18 | |

| Analyte | Result | Spike Level | Source Result | Percent Recovery | Recovery Limits | RPD | RPD Limit | Flags |
|--------------------------|-------------|-------------|---------------|------------------|-----------------|-----|-----------|-------|
| DUPLICATE | | | | | | | | |
| Laboratory ID: | 01-103-01 | | | | | | | |
| | ORIG | DUP | | | | | | |
| Dissolved Organic Carbon | 10.5 | 10.7 | NA | NA | NA | 2 | 15 | |

MATRIX SPIKE

| | | | | | | | | |
|--------------------------|-------------|------|------|----|--------|----|----|--|
| Laboratory ID: | 01-103-01 | | | | | | | |
| | MS | MS | | MS | | | | |
| Dissolved Organic Carbon | 19.9 | 10.0 | 10.5 | 94 | 75-125 | NA | NA | |

SPIKE BLANK

| | | | | | | | | |
|--------------------------|-------------|------|----|----|--------|----|----|--|
| Laboratory ID: | SB0117D1 | | | | | | | |
| | SB | SB | | SB | | | | |
| Dissolved Organic Carbon | 9.92 | 10.0 | NA | 99 | 80-120 | NA | NA | |



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 Project: 14-05806-000

TOTAL PHOSPHORUS
EPA 365.1

Matrix: Water
 Units: mg/L

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|-------------------|----------------------|-------|-----------|---------------|---------------|-------|
| Client ID: | COLM-20180111 | | | | | |
| Laboratory ID: | 01-103-01 | | | | | |
| Total Phosphorus | 0.013 | 0.010 | EPA 365.1 | 1-18-18 | 1-18-18 | |

| | | | | | | |
|-------------------|-----------------------|-------|-----------|---------|---------|--|
| Client ID: | COUMI-20180111 | | | | | |
| Laboratory ID: | 01-103-02 | | | | | |
| Total Phosphorus | 0.055 | 0.010 | EPA 365.1 | 1-18-18 | 1-18-18 | |

| | | | | | | |
|-------------------|-----------------------|-------|-----------|---------|---------|--|
| Client ID: | COUMO-20180111 | | | | | |
| Laboratory ID: | 01-103-03 | | | | | |
| Total Phosphorus | 0.046 | 0.010 | EPA 365.1 | 1-18-18 | 1-18-18 | |

| | | | | | | |
|-------------------|-----------------------|-------|-----------|---------|---------|--|
| Client ID: | EVAMS-20180111 | | | | | |
| Laboratory ID: | 01-103-04 | | | | | |
| Total Phosphorus | 0.019 | 0.010 | EPA 365.1 | 1-18-18 | 1-18-18 | |

| | | | | | | |
|-------------------|------------------------|-------|-----------|---------|---------|--|
| Client ID: | EVALSS-20180111 | | | | | |
| Laboratory ID: | 01-103-05 | | | | | |
| Total Phosphorus | 0.034 | 0.010 | EPA 365.1 | 1-18-18 | 1-18-18 | |

| | | | | | | |
|-------------------|-----------------------|-------|-----------|---------|---------|--|
| Client ID: | MONMN-20180111 | | | | | |
| Laboratory ID: | 01-103-06 | | | | | |
| Total Phosphorus | 0.037 | 0.010 | EPA 365.1 | 1-18-18 | 1-18-18 | |

| | | | | | | |
|-------------------|-----------------------|-------|-----------|---------|---------|--|
| Client ID: | MONMS-20180111 | | | | | |
| Laboratory ID: | 01-103-07 | | | | | |
| Total Phosphorus | 0.025 | 0.010 | EPA 365.1 | 1-18-18 | 1-18-18 | |



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TOTAL PHOSPHORUS
EPA 365.1

Matrix: Water
 Units: mg/L

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|-------------------|----------------------|-------|-----------|---------------|---------------|-------|
| Client ID: | MONM-20180111 | | | | | |
| Laboratory ID: | 01-103-08 | | | | | |
| Total Phosphorus | 0.091 | 0.010 | EPA 365.1 | 1-18-18 | 1-18-18 | |

| | | | | | | |
|-------------------|-----------------------|-------|-----------|---------|---------|--|
| Client ID: | SEIMN-20180111 | | | | | |
| Laboratory ID: | 01-103-09 | | | | | |
| Total Phosphorus | 0.087 | 0.010 | EPA 365.1 | 1-18-18 | 1-18-18 | |

| | | | | | | |
|-------------------|-----------------------|-------|-----------|---------|---------|--|
| Client ID: | SEIMS-20180111 | | | | | |
| Laboratory ID: | 01-103-10 | | | | | |
| Total Phosphorus | 0.049 | 0.010 | EPA 365.1 | 1-18-18 | 1-18-18 | |

| | | | | | | |
|-------------------|-----------------------|-------|-----------|---------|---------|--|
| Client ID: | TOSMI-20180111 | | | | | |
| Laboratory ID: | 01-103-11 | | | | | |
| Total Phosphorus | 0.048 | 0.010 | EPA 365.1 | 1-18-18 | 1-18-18 | |

| | | | | | | |
|-------------------|-----------------------|-------|-----------|---------|---------|--|
| Client ID: | TOSMO-20180111 | | | | | |
| Laboratory ID: | 01-103-12 | | | | | |
| Total Phosphorus | 0.045 | 0.010 | EPA 365.1 | 1-18-18 | 1-18-18 | |

| | | | | | | |
|-------------------|-----------------------|-------|-----------|---------|---------|--|
| Client ID: | TYLMI-20180111 | | | | | |
| Laboratory ID: | 01-103-13 | | | | | |
| Total Phosphorus | 0.040 | 0.010 | EPA 365.1 | 1-18-18 | 1-18-18 | |

| | | | | | | |
|-------------------|-----------------------|-------|-----------|---------|---------|--|
| Client ID: | TYLMO-20180111 | | | | | |
| Laboratory ID: | 01-103-14 | | | | | |
| Total Phosphorus | 0.032 | 0.010 | EPA 365.1 | 1-18-18 | 1-18-18 | |



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TOTAL PHOSPHORUS
EPA 365.1

Matrix: Water
Units: mg/L

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|-------------------|-----------------------|------------|---------------|----------------------|----------------------|--------------|
| Client ID: | QA-40-20180111 | | | | | |
| Laboratory ID: | 01-103-15 | | | | | |
| Total Phosphorus | 0.061 | 0.010 | EPA 365.1 | 1-18-18 | 1-18-18 | |



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**TOTAL PHOSPHORUS
 EPA 365.1
 QUALITY CONTROL**

Matrix: Water
 Units: mg/L

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|---------------------|-----------|-------|-----------|---------------|---------------|-------|
| METHOD BLANK | | | | | | |
| Laboratory ID: | MB0118W1 | | | | | |
| Total Phosphorus | ND | 0.010 | EPA 365.1 | 1-18-18 | 1-18-18 | |

| Analyte | Result | Spike Level | Source Result | Percent Recovery | Recovery Limits | RPD | RPD Limit | Flags |
|------------------|---------------|---------------|---------------|------------------|-----------------|-----|-----------|-------|
| DUPLICATE | | | | | | | | |
| Laboratory ID: | 01-103-01 | | | | | | | |
| | ORIG | DUP | | | | | | |
| Total Phosphorus | 0.0130 | 0.0140 | NA | NA | NA | 7 | 11 | |

| | | | | | | | | |
|---------------------|--------------|-------|--------|----|--------|----|----|--|
| MATRIX SPIKE | | | | | | | | |
| Laboratory ID: | 01-103-01 | | | | | | | |
| | MS | MS | | MS | | | | |
| Total Phosphorus | 0.236 | 0.250 | 0.0130 | 89 | 82-124 | NA | NA | |

| | | | | | | | | |
|--------------------|--------------|-------|----|-----|--------|----|----|--|
| SPIKE BLANK | | | | | | | | |
| Laboratory ID: | SB0118W1 | | | | | | | |
| | SB | SB | | SB | | | | |
| Total Phosphorus | 0.263 | 0.250 | NA | 105 | 87-114 | NA | NA | |



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TOTAL METALS
EPA 200.8

Matrix: Water
 Units: ug/L (ppb)

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|-------------------|----------------------|-----|-----------|---------------|---------------|-------|
| Client ID: | COLM-20180111 | | | | | |
| Laboratory ID: | 01-103-01 | | | | | |
| Copper | ND | 1.0 | EPA 200.8 | 1-16-18 | 1-17-18 | |
| Zinc | ND | 5.0 | EPA 200.8 | 1-16-18 | 1-17-18 | |

| | | | | | | |
|-------------------|-----------------------|-----|-----------|---------|---------|--|
| Client ID: | COUMI-20180111 | | | | | |
| Laboratory ID: | 01-103-02 | | | | | |
| Copper | 2.7 | 1.0 | EPA 200.8 | 1-16-18 | 1-17-18 | |
| Zinc | 16 | 5.0 | EPA 200.8 | 1-16-18 | 1-17-18 | |

| | | | | | | |
|-------------------|-----------------------|-----|-----------|---------|---------|--|
| Client ID: | COUMO-20180111 | | | | | |
| Laboratory ID: | 01-103-03 | | | | | |
| Copper | 2.3 | 1.0 | EPA 200.8 | 1-16-18 | 1-17-18 | |
| Zinc | 17 | 5.0 | EPA 200.8 | 1-16-18 | 1-17-18 | |

| | | | | | | |
|-------------------|-----------------------|-----|-----------|---------|---------|--|
| Client ID: | EVAMS-20180111 | | | | | |
| Laboratory ID: | 01-103-04 | | | | | |
| Copper | 1.2 | 1.0 | EPA 200.8 | 1-16-18 | 1-17-18 | |
| Zinc | ND | 5.0 | EPA 200.8 | 1-16-18 | 1-17-18 | |



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**TOTAL METALS
 EPA 200.8**

Matrix: Water
 Units: ug/L (ppb)

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|-------------------|------------------------|-----|-----------|---------------|---------------|-------|
| Client ID: | EVALSS-20180111 | | | | | |
| Laboratory ID: | 01-103-05 | | | | | |
| Copper | 1.6 | 1.0 | EPA 200.8 | 1-16-18 | 1-17-18 | |
| Zinc | ND | 5.0 | EPA 200.8 | 1-16-18 | 1-17-18 | |

| | | | | | | |
|-------------------|-----------------------|-----|-----------|---------|---------|--|
| Client ID: | MONMN-20180111 | | | | | |
| Laboratory ID: | 01-103-06 | | | | | |
| Copper | 2.4 | 1.0 | EPA 200.8 | 1-16-18 | 1-17-18 | |
| Zinc | 11 | 5.0 | EPA 200.8 | 1-16-18 | 1-17-18 | |

| | | | | | | |
|-------------------|-----------------------|-----|-----------|---------|---------|--|
| Client ID: | MONMS-20180111 | | | | | |
| Laboratory ID: | 01-103-07 | | | | | |
| Copper | 2.1 | 1.0 | EPA 200.8 | 1-16-18 | 1-17-18 | |
| Zinc | ND | 5.0 | EPA 200.8 | 1-16-18 | 1-17-18 | |

| | | | | | | |
|-------------------|----------------------|-----|-----------|---------|---------|--|
| Client ID: | MONM-20180111 | | | | | |
| Laboratory ID: | 01-103-08 | | | | | |
| Copper | 2.5 | 1.0 | EPA 200.8 | 1-16-18 | 1-17-18 | |
| Zinc | 17 | 5.0 | EPA 200.8 | 1-16-18 | 1-17-18 | |



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TOTAL METALS
EPA 200.8

Matrix: Water
 Units: ug/L (ppb)

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|-------------------|-----------------------|-----|-----------|---------------|---------------|-------|
| Client ID: | SEIMN-20180111 | | | | | |
| Laboratory ID: | 01-103-09 | | | | | |
| Copper | 5.2 | 1.0 | EPA 200.8 | 1-16-18 | 1-17-18 | |
| Zinc | 8.5 | 5.0 | EPA 200.8 | 1-16-18 | 1-17-18 | |

| | | | | | | |
|-------------------|-----------------------|-----|-----------|---------|---------|--|
| Client ID: | SEIMS-20180111 | | | | | |
| Laboratory ID: | 01-103-10 | | | | | |
| Copper | 1.2 | 1.0 | EPA 200.8 | 1-16-18 | 1-17-18 | |
| Zinc | ND | 5.0 | EPA 200.8 | 1-16-18 | 1-17-18 | |

| | | | | | | |
|-------------------|-----------------------|-----|-----------|---------|---------|--|
| Client ID: | TOSMI-20180111 | | | | | |
| Laboratory ID: | 01-103-11 | | | | | |
| Copper | 4.1 | 1.0 | EPA 200.8 | 1-16-18 | 1-17-18 | |
| Zinc | 47 | 5.0 | EPA 200.8 | 1-16-18 | 1-17-18 | |

| | | | | | | |
|-------------------|-----------------------|-----|-----------|---------|---------|--|
| Client ID: | TOSMO-20180111 | | | | | |
| Laboratory ID: | 01-103-12 | | | | | |
| Copper | 4.3 | 1.0 | EPA 200.8 | 1-16-18 | 1-17-18 | |
| Zinc | 50 | 5.0 | EPA 200.8 | 1-16-18 | 1-17-18 | |



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TOTAL METALS
EPA 200.8

Matrix: Water
 Units: ug/L (ppb)

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|-------------------|-----------------------|-----|-----------|---------------|---------------|-------|
| Client ID: | TYLMI-20180111 | | | | | |
| Laboratory ID: | 01-103-13 | | | | | |
| Copper | 3.0 | 1.0 | EPA 200.8 | 1-16-18 | 1-17-18 | |
| Zinc | 12 | 5.0 | EPA 200.8 | 1-16-18 | 1-17-18 | |

| | | | | | | |
|-------------------|-----------------------|-----|-----------|---------|---------|--|
| Client ID: | TYLMO-20180111 | | | | | |
| Laboratory ID: | 01-103-14 | | | | | |
| Copper | 3.6 | 1.0 | EPA 200.8 | 1-16-18 | 1-17-18 | |
| Zinc | 20 | 5.0 | EPA 200.8 | 1-16-18 | 1-17-18 | |

| | | | | | | |
|-------------------|-----------------------|-----|-----------|---------|---------|--|
| Client ID: | QA-40-20180111 | | | | | |
| Laboratory ID: | 01-103-15 | | | | | |
| Copper | 4.9 | 1.0 | EPA 200.8 | 1-16-18 | 1-17-18 | |
| Zinc | 49 | 5.0 | EPA 200.8 | 1-16-18 | 1-17-18 | |



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**TOTAL METALS
 EPA 200.8
 QUALITY CONTROL**

Matrix: Water
 Units: ug/L (ppb)

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|---------------------|-----------|-----|-----------|---------------|---------------|-------|
| METHOD BLANK | | | | | | |
| Laboratory ID: | MB0116WH1 | | | | | |
| Copper | ND | 1.0 | EPA 200.8 | 1-16-18 | 1-17-18 | |
| Zinc | ND | 5.0 | EPA 200.8 | 1-16-18 | 1-17-18 | |

| Analyte | Result | Spike Level | Source Result | Percent Recovery | Recovery Limits | RPD | RPD Limit | Flags |
|------------------|-------------|-------------|---------------|------------------|-----------------|-----|-----------|-------|
| DUPLICATE | | | | | | | | |
| Laboratory ID: | 01-103-15 | | | | | | | |
| | ORIG | DUP | | | | | | |
| Copper | 4.92 | 4.82 | NA | NA | NA | NA | 2 | 20 |
| Zinc | 49.4 | 48.8 | NA | NA | NA | NA | 1 | 20 |

MATRIX SPIKES

| Laboratory ID: | MS | MSD | MS | MSD | MS | MSD | MS | MSD | RPD | RPD Limit | Flags |
|----------------|------------|------------|-----|-----|------|------------|------------|--------|-----|-----------|-------|
| Laboratory ID: | 01-103-15 | | | | | | | | | | |
| Copper | 105 | 105 | 100 | 100 | 4.92 | 100 | 100 | 75-125 | 0 | 20 | |
| Zinc | 166 | 166 | 100 | 100 | 49.4 | 117 | 116 | 75-125 | 0 | 20 | |



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DISSOLVED METALS
EPA 200.8

Matrix: Water
 Units: ug/L (ppb)

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|-------------------|----------------------|-----|-----------|---------------|---------------|-------|
| Client ID: | COLM-20180111 | | | | | |
| Laboratory ID: | 01-103-01 | | | | | |
| Copper | ND | 1.0 | EPA 200.8 | | 1-17-18 | |
| Zinc | ND | 5.0 | EPA 200.8 | | 1-17-18 | |

| | | | | | | |
|-------------------|-----------------------|-----|-----------|--|---------|--|
| Client ID: | COUMI-20180111 | | | | | |
| Laboratory ID: | 01-103-02 | | | | | |
| Copper | 1.5 | 1.0 | EPA 200.8 | | 1-17-18 | |
| Zinc | 8.6 | 5.0 | EPA 200.8 | | 1-17-18 | |

| | | | | | | |
|-------------------|-----------------------|-----|-----------|--|---------|--|
| Client ID: | COUMO-20180111 | | | | | |
| Laboratory ID: | 01-103-03 | | | | | |
| Copper | 1.5 | 1.0 | EPA 200.8 | | 1-17-18 | |
| Zinc | 12 | 5.0 | EPA 200.8 | | 1-17-18 | |

| | | | | | | |
|-------------------|-----------------------|-----|-----------|--|---------|--|
| Client ID: | EVAMS-20180111 | | | | | |
| Laboratory ID: | 01-103-04 | | | | | |
| Copper | ND | 1.0 | EPA 200.8 | | 1-17-18 | |
| Zinc | ND | 5.0 | EPA 200.8 | | 1-17-18 | |



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DISSOLVED METALS
EPA 200.8

Matrix: Water
 Units: ug/L (ppb)

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|-------------------|------------------------|-----|-----------|---------------|---------------|-------|
| Client ID: | EVALSS-20180111 | | | | | |
| Laboratory ID: | 01-103-05 | | | | | |
| Copper | 1.2 | 1.0 | EPA 200.8 | | 1-17-18 | |
| Zinc | ND | 5.0 | EPA 200.8 | | 1-17-18 | |

| | | | | | | |
|-------------------|-----------------------|-----|-----------|--|---------|--|
| Client ID: | MONMN-20180111 | | | | | |
| Laboratory ID: | 01-103-06 | | | | | |
| Copper | 1.4 | 1.0 | EPA 200.8 | | 1-17-18 | |
| Zinc | 6.1 | 5.0 | EPA 200.8 | | 1-17-18 | |

| | | | | | | |
|-------------------|-----------------------|-----|-----------|--|---------|--|
| Client ID: | MONMS-20180111 | | | | | |
| Laboratory ID: | 01-103-07 | | | | | |
| Copper | 1.5 | 1.0 | EPA 200.8 | | 1-17-18 | |
| Zinc | ND | 5.0 | EPA 200.8 | | 1-17-18 | |

| | | | | | | |
|-------------------|----------------------|-----|-----------|--|---------|--|
| Client ID: | MONM-20180111 | | | | | |
| Laboratory ID: | 01-103-08 | | | | | |
| Copper | 1.3 | 1.0 | EPA 200.8 | | 1-17-18 | |
| Zinc | 6.4 | 5.0 | EPA 200.8 | | 1-17-18 | |



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DISSOLVED METALS
EPA 200.8

Matrix: Water
 Units: ug/L (ppb)

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|-------------------|-----------------------|-----|-----------|---------------|---------------|-------|
| Client ID: | SEIMN-20180111 | | | | | |
| Laboratory ID: | 01-103-09 | | | | | |
| Copper | ND | 1.0 | EPA 200.8 | | 1-17-18 | |
| Zinc | ND | 5.0 | EPA 200.8 | | 1-17-18 | |

| | | | | | | |
|-------------------|-----------------------|-----|-----------|--|---------|--|
| Client ID: | SEIMS-20180111 | | | | | |
| Laboratory ID: | 01-103-10 | | | | | |
| Copper | ND | 1.0 | EPA 200.8 | | 1-17-18 | |
| Zinc | ND | 5.0 | EPA 200.8 | | 1-17-18 | |

| | | | | | | |
|-------------------|-----------------------|-----|-----------|--|---------|--|
| Client ID: | TOSMI-20180111 | | | | | |
| Laboratory ID: | 01-103-11 | | | | | |
| Copper | 2.8 | 1.0 | EPA 200.8 | | 1-17-18 | |
| Zinc | 35 | 5.0 | EPA 200.8 | | 1-17-18 | |

| | | | | | | |
|-------------------|-----------------------|-----|-----------|--|---------|--|
| Client ID: | TOSMO-20180111 | | | | | |
| Laboratory ID: | 01-103-12 | | | | | |
| Copper | 2.7 | 1.0 | EPA 200.8 | | 1-17-18 | |
| Zinc | 28 | 5.0 | EPA 200.8 | | 1-17-18 | |



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DISSOLVED METALS
EPA 200.8

Matrix: Water
 Units: ug/L (ppb)

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|-------------------|-----------------------|-----|-----------|---------------|---------------|-------|
| Client ID: | TYLMI-20180111 | | | | | |
| Laboratory ID: | 01-103-13 | | | | | |
| Copper | 4.0 | 1.0 | EPA 200.8 | | 1-17-18 | |
| Zinc | 11 | 5.0 | EPA 200.8 | | 1-17-18 | |

| | | | | | | |
|-------------------|-----------------------|-----|-----------|--|---------|--|
| Client ID: | TYLMO-20180111 | | | | | |
| Laboratory ID: | 01-103-14 | | | | | |
| Copper | 2.0 | 1.0 | EPA 200.8 | | 1-17-18 | |
| Zinc | 10 | 5.0 | EPA 200.8 | | 1-17-18 | |

| | | | | | | |
|-------------------|-----------------------|-----|-----------|--|---------|--|
| Client ID: | QA-40-20180111 | | | | | |
| Laboratory ID: | 01-103-15 | | | | | |
| Copper | 2.6 | 1.0 | EPA 200.8 | | 1-17-18 | |
| Zinc | 29 | 5.0 | EPA 200.8 | | 1-17-18 | |



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**DISSOLVED METALS
 EPA 200.8
 QUALITY CONTROL**

Matrix: Water
 Units: ug/L (ppb)

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|---------------------|-----------|-----|-----------|---------------|---------------|-------|
| METHOD BLANK | | | | | | |
| Laboratory ID: | MB0117D1 | | | | | |
| Copper | ND | 1.0 | EPA 200.8 | | 1-17-18 | |
| Zinc | ND | 5.0 | EPA 200.8 | | 1-17-18 | |

| Analyte | Result | Spike Level | Source Result | Percent Recovery | Recovery Limits | RPD | RPD Limit | Flags |
|------------------|-------------|-------------|---------------|------------------|-----------------|-----|-----------|-------|
| DUPLICATE | | | | | | | | |
| Laboratory ID: | 01-103-15 | | | | | | | |
| | ORIG | DUP | | | | | | |
| Copper | 2.64 | 2.60 | NA | NA | NA | NA | 2 | 20 |
| Zinc | 29.2 | 29.0 | NA | NA | NA | NA | 1 | 20 |

MATRIX SPIKES

| | | | | | | | | | | |
|----------------|-------------|-------------|------|------|------|------------|------------|--------|---|----|
| Laboratory ID: | 01-103-15 | | | | | | | | | |
| | MS | MSD | MS | MSD | | MS | MSD | | | |
| Copper | 73.0 | 78.2 | 80.0 | 80.0 | 2.64 | 88 | 95 | 75-125 | 7 | 20 |
| Zinc | 115 | 118 | 80.0 | 80.0 | 29.2 | 107 | 111 | 75-125 | 3 | 20 |





Data Qualifiers and Abbreviations

- A - Due to a high sample concentration, the amount spiked is insufficient for meaningful MS/MSD recovery data.
 - B - The analyte indicated was also found in the blank sample.
 - C - The duplicate RPD is outside control limits due to high result variability when analyte concentrations are within five times the quantitation limit.
 - E - The value reported exceeds the quantitation range and is an estimate.
 - F - Surrogate recovery data is not available due to the high concentration of coeluting target compounds.
 - H - The analyte indicated is a common laboratory solvent and may have been introduced during sample preparation, and be impacting the sample result.
 - I - Compound recovery is outside of the control limits.
 - J - The value reported was below the practical quantitation limit. The value is an estimate.
 - K - Sample duplicate RPD is outside control limits due to sample inhomogeneity. The sample was re-extracted and re-analyzed with similar results.
 - L - The RPD is outside of the control limits.
 - M - Hydrocarbons in the gasoline range are impacting the diesel range result.
 - M1 - Hydrocarbons in the gasoline range (toluene-naphthalene) are present in the sample.
 - N - Hydrocarbons in the lube oil range are impacting the diesel range result.
 - N1 - Hydrocarbons in diesel range are impacting lube oil range results.
 - O - Hydrocarbons indicative of heavier fuels are present in the sample and are impacting the gasoline result.
 - P - The RPD of the detected concentrations between the two columns is greater than 40.
 - Q - Surrogate recovery is outside of the control limits.
 - S - Surrogate recovery data is not available due to the necessary dilution of the sample.
 - T - The sample chromatogram is not similar to a typical _____.
 - U - The analyte was analyzed for, but was not detected above the reported sample quantitation limit.
 - U1 - The practical quantitation limit is elevated due to interferences present in the sample.
 - V - Matrix Spike/Matrix Spike Duplicate recoveries are outside control limits due to matrix effects.
 - W - Matrix Spike/Matrix Spike Duplicate RPD are outside control limits due to matrix effects.
 - X - Sample extract treated with a mercury cleanup procedure.
 - X1 - Sample extract treated with a sulfuric acid/silica gel cleanup procedure.
 - Y - The calibration verification for this analyte exceeded the 20% drift specified in method 8260C, and therefore the reported result should be considered an estimate. The overall performance of the calibration verification standard met the acceptance criteria of the method.
 - Z -
- ND - Not Detected at PQL
 PQL - Practical Quantitation Limit
 RPD - Relative Percent Difference





Am Test Inc.
13600 NE 126TH PL
Suite C
Kirkland, WA 98034
(425) 885-1664

**Professional
Analytical
Services**

Jan 30 2018
On-Site Environmental
14648 NE 95th ST
Redmond, WA 98052
Attention: David Baumeister

Dear David Baumeister:

Enclosed please find the analytical data for your REDMOND PAIRED WATERSHED STUDY project.

The following is a cross correlation of client and laboratory identifications for your convenience.

| CLIENT ID | MATRIX | AMTEST ID | TEST |
|-----------------|--------|------------|------------|
| COLM-20180111 | Water | 18-A000585 | Micro, NUT |
| COUMI-20180111 | Water | 18-A000586 | Micro, NUT |
| COUMO-20180111 | Water | 18-A000587 | Micro, NUT |
| EVAMS-20180111 | Water | 18-A000588 | Micro, NUT |
| EVALSS-20180111 | Water | 18-A000589 | Micro, NUT |
| MONMN-20180111 | Water | 18-A000590 | Micro, NUT |
| MONMS-20180111 | Water | 18-A000591 | Micro, NUT |
| MONM-20180111 | Water | 18-A000592 | Micro, NUT |
| SEIMN-20180111 | Water | 18-A000593 | Micro, NUT |
| SEIMS-20180111 | Water | 18-A000594 | Micro, NUT |
| TOSMI-20180111 | Water | 18-A000595 | Micro, NUT |
| TOSMO-20180111 | Water | 18-A000596 | Micro, NUT |
| TYLMI-20180111 | Water | 18-A000597 | Micro, NUT |
| TYLMO-20180111 | Water | 18-A000598 | Micro, NUT |
| QA-40-20180111 | Water | 18-A000599 | Micro, NUT |

Your samples were received on Thursday, January 11, 2018. At the time of receipt, the samples were logged in and properly maintained prior to the subsequent analysis.

The analytical procedures used at AmTest are well documented and are typically derived from the protocols of the EPA, USDA, FDA or the Army Corps of Engineers.

Following the analytical data you will find the Quality Control (QC) results.

Please note that the detection limits that are listed in the body of the report refer to the Practical Quantitation Limits (PQL's), as opposed to the Method Detection Limits (MDL's).

Am Test Inc.
13600 NE 126TH PL
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Kirkland, WA 98034
(425) 885-1664

**Professional
Analytical
Services**

Jan 30 2018
On-Site Environmental
continued . . .

If you should have any questions pertaining to the data package, please feel free to contact me.

Sincerely,


Aaron W. Young
Laboratory Manager

Project #: 14-05806-000
PO Number: 01-103

BACT = Bacteriological
CONV = Conventional

MET = Metals
ORG = Organics

NUT=Nutrients
DEM=Demand

MIN=Minerals

Am Test Inc.
13600 NE 126TH PL
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www.amtestlab.com



*Professional
Analytical
Services*

ANALYSIS REPORT

On-Site Environmental
14648 NE 95th ST
Redmond, WA 98052
Attention: David Baumeister
Project Name: REDMOND PAIRED WATERSHED STUDY
Project #: 14-05806-000
PO Number: 01-103
All results reported on an as received basis.

Date Received: 01/11/18
Date Reported: 1/30/18

AMTEST Identification Number **18-A000585**
Client Identification **COLM-20180111**
Sampling Date **01/11/18, 10:20**

Results

| PARAMETER | RESULT | UNITS | Q | D.L. | METHOD | ANALYST | DATE |
|--------------------------|--------|------------|---|------|-----------|---------|----------|
| Fecal Coliform | 48. | CFU/100 ml | | 1 | SM 9222D | JM | 01/11/18 |
| Total Nitrogen (NOX&TKN) | 0.58 | mg/l | | 0.1 | | | |
| Total Nitrogen (TKN) | 0.495 | mg/l | | 0.1 | SM4500N | JC | 01/23/18 |
| Nitrate + Nitrite | 0.082 | mg/l | | 0.01 | SM4500NO3 | JC | 01/22/18 |

AMTEST Identification Number **18-A000586**
Client Identification **COUMI-20180111**
Sampling Date **01/11/18, 07:30**

Results

| PARAMETER | RESULT | UNITS | Q | D.L. | METHOD | ANALYST | DATE |
|--------------------------|--------|------------|---|------|-----------|---------|----------|
| Fecal Coliform | 76. | CFU/100 ml | | 1 | SM 9222D | JM | 01/11/18 |
| Total Nitrogen (NOX&TKN) | 0.91 | mg/l | | 0.1 | | | |
| Total Nitrogen (TKN) | 0.441 | mg/l | | 0.1 | SM4500N | JC | 01/23/18 |
| Nitrate + Nitrite | 0.47 | mg/l | | 0.01 | SM4500NO3 | JC | 01/22/18 |

AMTEST Identification Number **18-A000587**
Client Identification **COUMO-20180111**
Sampling Date **01/11/18, 07:15**

Results

| PARAMETER | RESULT | UNITS | Q | D.L. | METHOD | ANALYST | DATE |
|--------------------------|--------|------------|---|------|-----------|---------|----------|
| Fecal Coliform | 430 | CFU/100 ml | | 1 | SM 9222D | JM | 01/11/18 |
| Total Nitrogen (NOX&TKN) | 0.92 | mg/l | | 0.1 | | | |
| Total Nitrogen (TKN) | 0.407 | mg/l | | 0.1 | SM4500N | JC | 01/23/18 |
| Nitrate + Nitrite | 0.51 | mg/l | | 0.01 | SM4500NO3 | JC | 01/22/18 |

AMTEST Identification Number **18-A000588**
Client Identification **EVAMS-20180111**
Sampling Date **01/11/18, 08:20**

Results

| PARAMETER | RESULT | UNITS | Q | D.L. | METHOD | ANALYST | DATE |
|--------------------------|--------|------------|---|------|-----------|---------|----------|
| Fecal Coliform | 28. | CFU/100 ml | | 1 | SM 9222D | JM | 01/11/18 |
| Total Nitrogen (NOX&TKN) | 1.94 | mg/l | | 0.1 | | | |
| Total Nitrogen (TKN) | 0.535 | mg/l | | 0.1 | SM4500N | JC | 01/23/18 |
| Nitrate + Nitrite | 1.4 | mg/l | | 0.01 | SM4500NO3 | JC | 01/22/18 |

AMTEST Identification Number **18-A000589**
Client Identification **EVALSS-20180111**
Sampling Date **01/11/18, 08:40**

Results

| PARAMETER | RESULT | UNITS | Q | D.L. | METHOD | ANALYST | DATE |
|--------------------------|--------|------------|---|------|-----------|---------|----------|
| Fecal Coliform | 130 | CFU/100 ml | | 1 | SM 9222D | JM | 01/11/18 |
| Total Nitrogen (NOX&TKN) | 1.90 | mg/l | | 0.1 | | | |
| Total Nitrogen (TKN) | 0.699 | mg/l | | 0.1 | SM4500N | JC | 01/23/18 |
| Nitrate + Nitrite | 1.2 | mg/l | | 0.01 | SM4500NO3 | JC | 01/22/18 |

AMTEST Identification Number **18-A000590**
Client Identification **MONMN-20180111**
Sampling Date **01/11/18, 09:00**

Results

| PARAMETER | RESULT | UNITS | Q | D.L. | METHOD | ANALYST | DATE |
|--------------------------|--------|------------|---|------|-----------|---------|----------|
| Fecal Coliform | 42. | CFU/100 ml | | 1 | SM 9222D | JM | 01/11/18 |
| Total Nitrogen (NOX&TKN) | 1.32 | mg/l | | 0.1 | | | |
| Total Nitrogen (TKN) | 0.505 | mg/l | | 0.1 | SM4500N | JC | 01/23/18 |
| Nitrate + Nitrite | 0.81 | mg/l | | 0.01 | SM4500NO3 | JC | 01/22/18 |

AMTEST Identification Number **18-A000591**
Client Identification **MONMS-20180111**
Sampling Date **01/11/18, 09:15**

Results

| PARAMETER | RESULT | UNITS | Q | D.L. | METHOD | ANALYST | DATE |
|--------------------------|--------|------------|---|------|-----------|---------|----------|
| Fecal Coliform | 98. | CFU/100 ml | | 1 | SM 9222D | JM | 01/11/18 |
| Total Nitrogen (NOX&TKN) | 1.16 | mg/l | | 0.1 | | | |
| Total Nitrogen (TKN) | 0.530 | mg/l | | 0.1 | SM4500N | JC | 01/23/18 |
| Nitrate + Nitrite | 0.63 | mg/l | | 0.01 | SM4500NO3 | JC | 01/22/18 |

AMTEST Identification Number **18-A000592**
Client Identification **MONM-20180111**
Sampling Date **01/11/18, 10:10**

Results

| PARAMETER | RESULT | UNITS | Q | D.L. | METHOD | ANALYST | DATE |
|--------------------------|--------|------------|---|------|-----------|---------|----------|
| Fecal Coliform | 190 | CFU/100 ml | | 1 | SM 9222D | JM | 01/11/18 |
| Total Nitrogen (NOX&TKN) | 0.99 | mg/l | | 0.1 | | | |
| Total Nitrogen (TKN) | 0.520 | mg/l | | 0.1 | SM4500N | JC | 01/23/18 |
| Nitrate + Nitrite | 0.47 | mg/l | | 0.01 | SM4500NO3 | JC | 01/22/18 |

AMTEST Identification Number **18-A000593**
Client Identification **SEIMN-20180111**
Sampling Date **01/11/18, 09:50**

Results

| PARAMETER | RESULT | UNITS | Q | D.L. | METHOD | ANALYST | DATE |
|--------------------------|--------|------------|---|------|-----------|---------|----------|
| Fecal Coliform | 20. | CFU/100 ml | | 1 | SM 9222D | JM | 01/11/18 |
| Total Nitrogen (NOX&TKN) | 0.95 | mg/l | | 0.1 | | | |
| Total Nitrogen (TKN) | 0.609 | mg/l | | 0.1 | SM4500N | JC | 01/23/18 |
| Nitrate + Nitrite | 0.34 | mg/l | | 0.01 | SM4500NO3 | JC | 01/22/18 |

AMTEST Identification Number **18-A000594**
Client Identification **SEIMS-20180111**
Sampling Date **01/11/18, 09:50**

Results

| PARAMETER | RESULT | UNITS | Q | D.L. | METHOD | ANALYST | DATE |
|--------------------------|--------|------------|---|------|-----------|---------|----------|
| Fecal Coliform | 140 | CFU/100 ml | | 1 | SM 9222D | JM | 01/11/18 |
| Total Nitrogen (NOX&TKN) | 0.88 | mg/l | | 0.1 | | | |
| Total Nitrogen (TKN) | 0.665 | mg/l | | 0.1 | SM4500N | JC | 01/23/18 |
| Nitrate + Nitrite | 0.21 | mg/l | | 0.01 | SM4500NO3 | JC | 01/22/18 |

AMTEST Identification Number **18-A000595**
Client Identification **TOSMI-20180111**
Sampling Date **01/11/18, 07:45**

Results

| PARAMETER | RESULT | UNITS | Q | D.L. | METHOD | ANALYST | DATE |
|--------------------------|--------|------------|---|------|-----------|---------|----------|
| Fecal Coliform | 740 | CFU/100 ml | | 1 | SM 9222D | JM | 01/11/18 |
| Total Nitrogen (NOX&TKN) | 0.67 | mg/l | | 0.1 | | | |
| Total Nitrogen (TKN) | 0.387 | mg/l | | 0.1 | SM4500N | JC | 01/23/18 |
| Nitrate + Nitrite | 0.28 | mg/l | | 0.01 | SM4500NO3 | JC | 01/22/18 |

AMTEST Identification Number **18-A000596**
Client Identification **TOSMO-20180111**
Sampling Date **01/11/18, 07:30**

Results

| PARAMETER | RESULT | UNITS | Q | D.L. | METHOD | ANALYST | DATE |
|--------------------------|--------|------------|---|------|-----------|---------|----------|
| Fecal Coliform | 670 | CFU/100 ml | | 1 | SM 9222D | JM | 01/11/18 |
| Total Nitrogen (NOX&TKN) | 0.80 | mg/l | | 0.1 | | | |
| Total Nitrogen (TKN) | 0.444 | mg/l | | 0.1 | SM4500N | JC | 01/23/18 |
| Nitrate + Nitrite | 0.36 | mg/l | | 0.01 | SM4500NO3 | JC | 01/22/18 |

AMTEST Identification Number **18-A000597**
Client Identification **TYLMI-20180111**
Sampling Date **01/11/18, 08:30**

Results

| PARAMETER | RESULT | UNITS | Q | D.L. | METHOD | ANALYST | DATE |
|--------------------------|--------|------------|---|------|-----------|---------|----------|
| Fecal Coliform | 190 | CFU/100 ml | | 1 | SM 9222D | JM | 01/11/18 |
| Total Nitrogen (NOX&TKN) | 1.02 | mg/l | | 0.1 | | | |
| Total Nitrogen (TKN) | 0.585 | mg/l | | 0.1 | SM4500N | JC | 01/23/18 |
| Nitrate + Nitrite | 0.44 | mg/l | | 0.01 | SM4500NO3 | JC | 01/22/18 |

AMTEST Identification Number 18-A000598
Client Identification TYLMO-20180111
Sampling Date 01/11/18, 08:15


Results

| PARAMETER | RESULT | UNITS | Q | D.L. | METHOD | ANALYST | DATE |
|--------------------------|--------|------------|---|------|-----------|---------|----------|
| Fecal Coliform | 650 | CFU/100 ml | | 1 | SM 9222D | JM | 01/11/18 |
| Total Nitrogen (NOX&TKN) | 0.78 | mg/l | | 0.1 | | | |
| Total Nitrogen (TKN) | 0.416 | mg/l | | 0.1 | SM4500N | JC | 01/23/18 |
| Nitrate + Nitrite | 0.36 | mg/l | | 0.01 | SM4500NO3 | JC | 01/22/18 |

AMTEST Identification Number 18-A000599
Client Identification QA-40-20180111
Sampling Date 01/11/18, 07:55

Results

| PARAMETER | RESULT | UNITS | Q | D.L. | METHOD | ANALYST | DATE |
|--------------------------|--------|------------|---|------|-----------|---------|----------|
| Fecal Coliform | 780 | CFU/100 ml | | 1 | SM 9222D | JM | 01/11/18 |
| Total Nitrogen (NOX&TKN) | 0.78 | mg/l | | 0.1 | | | |
| Total Nitrogen (TKN) | 0.442 | mg/l | | 0.1 | SM4500N | JC | 01/23/18 |
| Nitrate + Nitrite | 0.34 | mg/l | | 0.01 | SM4500NO3 | JC | 01/22/18 |


Aaron W. Young
Laboratory Manager

QC Summary for sample numbers: 18-A000585 to 18-A000599

DUPLICATES

| SAMPLE # | ANALYTE | UNITS | SAMPLE VALUE | DUP VALUE | RPD |
|------------|----------------------|------------|--------------|-----------|------|
| 18-A000585 | Fecal Coliform | CFU/100 ml | 48. | 25. | 63. |
| 18-A000599 | Fecal Coliform | CFU/100 ml | 780 | 580 | 29. |
| 18-A000473 | Total Nitrogen (TKN) | mg/l | 33.0 | 36.1 | 9.0 |
| 18-A000593 | Total Nitrogen (TKN) | mg/l | 0.609 | 0.700 | 14. |
| 18-A000652 | Total Nitrogen (TKN) | mg/l | < 0.1 | < 0.1 | |
| 18-A000661 | Total Nitrogen (TKN) | mg/l | 0.134 | 0.125 | 6.9 |
| 18-A000331 | Nitrate + Nitrite | mg/l | 4.6 | 5.4 | 16. |
| 18-A000478 | Nitrate + Nitrite | mg/l | 0.37 | 0.38 | 2.7 |
| 18-A000586 | Nitrate + Nitrite | mg/l | 0.47 | 0.47 | 0.00 |
| 18-A000596 | Nitrate + Nitrite | mg/l | 0.36 | 0.35 | 2.8 |
| 18-A000629 | Nitrate + Nitrite | mg/l | 0.58 | 0.58 | 0.00 |
| 18-A000895 | Nitrate + Nitrite | mg/l | 1.3 | 1.3 | 0.00 |
| 18-A000905 | Nitrate + Nitrite | mg/l | 1.3 | 1.3 | 0.00 |
| 18-A000949 | Nitrate + Nitrite | mg/l | 0.18 | 0.18 | 0.00 |
| 18-A000959 | Nitrate + Nitrite | mg/l | 0.027 | 0.030 | 11. |

MATRIX SPIKES

| SAMPLE # | ANALYTE | UNITS | SAMPLE VALUE | SMPL+ SPK | SPK AMT | RECOVERY |
|------------|----------------------|-------|--------------|-----------|---------|----------|
| 18-A000473 | Total Nitrogen (TKN) | mg/l | 33.0 | 57.5 | 25.0 | 98.00 % |
| 18-A000652 | Total Nitrogen (TKN) | mg/l | < 0.1 | 1.90 | 2.00 | 95.00 % |
| 18-A000661 | Total Nitrogen (TKN) | mg/l | 0.134 | 2.05 | 2.00 | 95.80 % |
| 18-A000331 | Nitrate + Nitrite | mg/l | 4.6 | 9.6 | 5.0 | 100.00 % |
| 18-A000478 | Nitrate + Nitrite | mg/l | 0.37 | 1.4 | 1.0 | 103.00 % |
| 18-A000586 | Nitrate + Nitrite | mg/l | 0.47 | 1.4 | 1.0 | 93.00 % |
| 18-A000596 | Nitrate + Nitrite | mg/l | 0.36 | 1.3 | 1.0 | 94.00 % |
| 18-A000629 | Nitrate + Nitrite | mg/l | 0.58 | 1.5 | 1.0 | 92.00 % |
| 18-A000895 | Nitrate + Nitrite | mg/l | 1.3 | 2.3 | 1.0 | 100.00 % |
| 18-A000905 | Nitrate + Nitrite | mg/l | 1.3 | 2.2 | 1.0 | 90.00 % |
| 18-A000949 | Nitrate + Nitrite | mg/l | 0.18 | 1.1 | 1.0 | 92.00 % |
| 18-A000959 | Nitrate + Nitrite | mg/l | 0.027 | 0.94 | 1.0 | 91.30 % |

QC Summary for sample numbers: 18-A000585 to 18-A000599...

STANDARD REFERENCE MATERIALS

| ANALYTE | UNITS | TRUE VALUE | MEASURED VALUE | RECOVERY |
|----------------------|-------|------------|----------------|----------|
| Total Nitrogen (TKN) | mg/l | 1.00 | 1.01 | 101. % |
| Total Nitrogen (TKN) | mg/l | 1.00 | 0.981 | 98.1 % |
| Nitrate + Nitrite | mg/l | 1.0 | 0.98 | 98.0 % |
| Nitrate + Nitrite | mg/l | 1.0 | 1.0 | 100. % |
| Nitrate + Nitrite | mg/l | 1.0 | 0.96 | 96.0 % |

BLANKS

| ANALYTE | UNITS | RESULT |
|----------------------|------------|--------|
| Fecal Coliform | CFU/100 ml | < 1 |
| Fecal Coliform | CFU/100 ml | < 1 |
| Total Nitrogen (TKN) | mg/l | < 0.1 |
| Total Nitrogen (TKN) | mg/l | < 0.1 |
| Nitrate + Nitrite | mg/l | < 0.01 |
| Nitrate + Nitrite | mg/l | < 0.01 |
| Nitrate + Nitrite | mg/l | < 0.01 |



14648 NE 95th Street, Redmond, WA 98052 · (425) 383-3881

Laboratory: AmTest Laboratories

Attention: Aaron Young

13600 NE 126th PI Kirkland, WA 98034

Phone Number: (425) 885-1664

Turnaround Request

1 Day 2 Day 3 Day

Standard

Other: _____

Laboratory Reference #: 01-103

Project Manager: Blair Goodrow

email: bgoodrow@onsite-env.com

Project Number: 14-05806-000

Project Name: Redmond Paired Watershed Study

| Lab ID | Sample Identification | Date Sampled | Time Sampled | Matrix | # of Cont. | Requested Analyses |
|---|-----------------------|-------------------|--------------|----------------|-------------|--|
| 585 586 587 588 89 90 91 92 93 94 1 | COLM-20180111 | 1/11/18 | 10:20 | Water | 2 | Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N |
| 2 | COUMI-20180111 | 1/11/18 | 7:30 | Water | 2 | Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N |
| 3 | COUMO-20180111 | 1/11/18 | 7:15 | Water | 2 | Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N |
| 4 | EVAMS-20180111 | 1/11/18 | 8:20 | Water | 2 | Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N |
| 5 | EVALSS-20180111 | 1/11/18 | 8:40 | Water | 2 | Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N |
| 6 | MONMN-20180111 | 1/11/18 | 9:00 | Water | 2 | Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N |
| 7 | MONMS-20180111 | 1/11/18 | 9:15 | Water | 2 | Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N |
| 8 | MONM-20180111 | 1/11/18 | 10:10 | Water | 2 | Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N |
| 9 | SEIMN-20180111 | 1/11/18 | 9:50 | Water | 2 | Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N |
| 10 | SEIMS-20180111 | 1/11/18 | 9:50 | Water | 2 | Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N |
| Signature | | Company | | Date | Time | Comments/Special Instructions |
| Relinquished by: <i>[Signature]</i> | | <i>OnSite Env</i> | | <i>1/11/18</i> | <i>1220</i> | |
| Received by: <i>[Signature]</i> | | <i>T=4.8</i> | | <i>1/11/18</i> | <i>1250</i> | |
| Relinquished by: | | | | | | |
| Received by: | | | | | | |
| Relinquished by: | | | | | | EDDs - CSV Reporting Limits: Fecal Coliform - 1.0 cfu/100ml Total Nitrogen - .10 mg/L |
| Received by: | | | | | | |



14648 NE 95th Street, Redmond, WA 98052 · (425) 883-3881

Laboratory: AmTest Laboratories

Attention: Aaron Young

13600 NE 126th PI Kirkland, WA 98034

Phone Number: (425) 885-1664

Turnaround Request

1 Day 2 Day 3 Day

Standard

Other: _____

Laboratory Reference #: 01-103

Project Manager: Blair Goodrow

email: bgoodrow@onsite-env.com

Project Number: 14-05806-000

Project Name: Redmond Paired Watershed Study

| Lab ID | Sample Identification | Date Sampled | Time Sampled | Matrix | # of Cont. | Requested Analyses |
|-----------|-----------------------|--------------|--------------|--------|------------|---|
| 595 11 | TOSMI-20180111 | 1/11/18 | 7:45 | Water | 2 | Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N |
| 96 12 | TOSMC-20180111 | 1/11/18 | 7:30 | Water | 2 | Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N |
| 97 13 | TYLMI-20180111 | 1/11/18 | 8:30 | Water | 2 | Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N |
| 98 14 | TYLMO-20180111 | 1/11/18 | 8:15 | Water | 2 | Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N |
| 99 15 | QA-40-20180111 | 1/11/18 | 7:55 | Water | 2 | Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |

| Signature | Company | Date | Time | Comments/Special Instructions |
|------------------|---------------------|---------|-------|--|
| Relinquished by: | AmTest Laboratories | 1/11/18 | 12:25 | EDDs - CSV Reporting Limits: Fecal Coliform - 1.0 cfu/100ml Total Nitrogen - .10 mg/L |
| Received by: | T=4.8 | 1/11/18 | 12:50 | |
| Relinquished by: | | | | |
| Received by: | | | | |
| Relinquished by: | | | | |
| Received by: | | | | |



14648 NE 95th Street, Redmond, WA 98052
Telephone: 425.883.3881

Company: Herrera Environmental Consultants

Project No.: 14-05806-000

Project Name: Redmond Paired Watershed Study

Project Manager: George Iftner

CHAIN OF CUSTODY

Turnaround Requested:

_____ 1 Day

_____ 2 Day

_____ 3 Day

X Standard

Laboratory No. **01-103**

Requested Analyses

| | | | | | | | | | | | | | | | | | | |
|-----------------------------------|-----------------------|---------------------------------|-------------------------------------|---------------------------|------------------------------|------------------------------|-----------------------------|-----------------------------------|--|--|--|--|--|--|--|--|--|--|
| Total Suspended Solids (SM 2540D) | Turbidity (EPA 181.1) | Hardness (EPA 200.7 / SM 2340B) | Dissolved Organ Carbon (SM 5310B) * | Fecal Coliform (SM 9222D) | Total Phosphorus (EPA 365.1) | Total Nitrogen (SM 4500 N-B) | Total Cu and Zn (EPA 200.8) | Dissolved Cu and Zn (EPA 200.8) * | | | | | | | | | | |
|-----------------------------------|-----------------------|---------------------------------|-------------------------------------|---------------------------|------------------------------|------------------------------|-----------------------------|-----------------------------------|--|--|--|--|--|--|--|--|--|--|

| Lab ID | Sample Identification | Date Sampled | Time Sampled | Matrix | # of Cont. | Total Suspended Solids (SM 2540D) | Turbidity (EPA 181.1) | Hardness (EPA 200.7 / SM 2340B) | Dissolved Organ Carbon (SM 5310B) * | Fecal Coliform (SM 9222D) | Total Phosphorus (EPA 365.1) | Total Nitrogen (SM 4500 N-B) | Total Cu and Zn (EPA 200.8) | Dissolved Cu and Zn (EPA 200.8) * | | | | |
|--------|-----------------------|--------------|--------------|--------|------------|-----------------------------------|-----------------------|---------------------------------|-------------------------------------|---------------------------|------------------------------|------------------------------|-----------------------------|-----------------------------------|--|--|--|--|
| 1 | COLM-2018 0111 | 1-11-18 | 10:20 | Water | 7 | X | X | X | X | X | X | X | X | X | | | | |
| 2 | COUMI-2018 0111 | | 7:30 | Water | 7 | X | X | X | X | X | X | X | X | X | | | | |
| 3 | COUMO-2018 0111 | | 7:15 | Water | 7 | X | X | X | X | X | X | X | X | X | | | | |
| 4 | EVAMS-2018 0111 | | 8:20 | Water | 7 | X | X | X | X | X | X | X | X | X | | | | |
| 5 | EVALSS-2018 0111 | | 8:40 | Water | 7 | X | X | X | X | X | X | X | X | X | | | | |
| 6 | MONMN-2018 0111 | | 9:00 | Water | 7 | X | X | X | X | X | X | X | X | X | | | | |
| 7 | MONMS-2018 0111 | | 9:15 | Water | 7 | X | X | X | X | X | X | X | X | X | | | | |
| 8 | MONM-2018 0111 | | 10:10 | Water | 7 | X | X | X | X | X | X | X | X | X | | | | |
| 9 | SEIMN-2018 0111 | | 9:50 | Water | 7 | X | X | X | X | X | X | X | X | X | | | | |
| 10 | SEIMS-2018 0111 | | 9:50 | Water | 7 | X | X | X | X | X | X | X | X | X | | | | |
| 11 | TOSMI-2018 0111 | | 7:45 | Water | 7 | X | X | X | X | X | X | X | X | X | | | | |
| 12 | TOSMO-2018 0111 | | 7:30 | Water | 7 | X | X | X | X | X | X | X | X | X | | | | |
| 13 | TYLMI-2018 0111 | | 8:30 | Water | 7 | X | X | X | X | X | X | X | X | X | | | | |
| 14 | TYLMO-2018 0111 | | 8:15 | Water | 7 | X | X | X | X | X | X | X | X | X | | | | |
| 15 | QA 40-20180111 | | 7:55 | Water | 7 | X | X | X | X | X | X | X | X | X | | | | |

Relinquished by Miamulhu Date 1-11-18 Received by [Signature] Date 1/11/18

Firm HEC Time 10:55 Firm CE Time 10:55

Relinquished by _____ Date _____ Received by _____ Date _____

Firm _____ Time _____ Firm _____ Time _____

Comments:
* - field filtered with 0.45 µm filter within 15 minutes of collecting sample

CHAIN OF CUSTODY

14648 NE 95th Street, Redmond, WA 98052
Telephone: 425.883.3881

Company: Herrera Environmental Consultants
Project No.: 14-05806-000
Project Name: Redmond Paired Watershed Study
Project Manager: George Iftner

Turnaround Requested:

 1 Day
 2 Day
 3 Day
 Standard

Laboratory No. **01-103**
Requested Analyses

| | | | | | | | | | | | | | | | | | | |
|-----------------------------------|-----------------------|---------------------------------|-------------------------------------|---------------------------|------------------------------|------------------------------|-----------------------------|-----------------------------------|--|--|--|--|--|--|--|--|--|--|
| Total Suspended Solids (SM 2540D) | Turbidity (EPA 181.1) | Hardness (EPA 200.7 / SM 2340B) | Dissolved Organ Carbon (SM 5310B) * | Fecal Coliform (SM 9222D) | Total Phosphorus (EPA 365.1) | Total Nitrogen (SM 4500 N-B) | Total Cu and Zn (EPA 200.8) | Dissolved Cu and Zn (EPA 200.8) * | | | | | | | | | | |
|-----------------------------------|-----------------------|---------------------------------|-------------------------------------|---------------------------|------------------------------|------------------------------|-----------------------------|-----------------------------------|--|--|--|--|--|--|--|--|--|--|

| Lab ID | Sample Identification | Date Sampled | Time Sampled | Matrix | # of Cont. | Total Suspended Solids (SM 2540D) | Turbidity (EPA 181.1) | Hardness (EPA 200.7 / SM 2340B) | Dissolved Organ Carbon (SM 5310B) * | Fecal Coliform (SM 9222D) | Total Phosphorus (EPA 365.1) | Total Nitrogen (SM 4500 N-B) | Total Cu and Zn (EPA 200.8) | Dissolved Cu and Zn (EPA 200.8) * | | | | |
|--------|-----------------------|--------------|--------------|--------|------------|-----------------------------------|-----------------------|---------------------------------|-------------------------------------|---------------------------|------------------------------|------------------------------|-----------------------------|-----------------------------------|--|--|--|--|
| 1 | COLM-2018 0111 | 1-11-18 | 10:20 | Water | 7 | X | X | X | X | X | X | X | X | X | | | | |
| 2 | COUMI-2018 0111 | | 7:30 | Water | 7 | X | X | X | X | X | X | X | X | X | | | | |
| 3 | COUMO-2018 0111 | | 7:15 | Water | 7 | X | X | X | X | X | X | X | X | X | | | | |
| 4 | EVAMS-2018 0111 | | 8:20 | Water | 7 | X | X | X | X | X | X | X | X | X | | | | |
| 5 | EVALSS-2018 0111 | | 8:40 | Water | 7 | X | X | X | X | X | X | X | X | X | | | | |
| 6 | MONMN-2018 0111 | | 9:00 | Water | 7 | X | X | X | X | X | X | X | X | X | | | | |
| 7 | MONMS-2018 0111 | | 9:15 | Water | 7 | X | X | X | X | X | X | X | X | X | | | | |
| 8 | MONM-2018 0111 | | 10:10 | Water | 7 | X | X | X | X | X | X | X | X | X | | | | |
| 9 | SEIMN-2018 0111 | | 9:50 | Water | 7 | X | X | X | X | X | X | X | X | X | | | | |
| 10 | SEIMS-2018 0111 | | 9:50 | Water | 7 | X | X | X | X | X | X | X | X | X | | | | |
| 11 | TOSMI-2018 0111 | 7:30 | 7:45 | Water | 7 | X | X | X | X | X | X | X | X | X | | | | |
| 12 | TOSMO-2018 0111 | 7:45 | 7:30 | Water | 7 | X | X | X | X | X | X | X | X | X | | | | |
| 13 | TYLMI-2018 0111 | | 8:30 | Water | 7 | X | X | X | X | X | X | X | X | X | | | | |
| 14 | TYLMO-2018 0111 | | 8:15 | Water | 7 | X | X | X | X | X | X | X | X | X | | | | |
| 15 | QA 40-20180111 | | 7:55 | Water | 7 | X | X | X | X | X | X | X | X | X | | | | |

Relinquished by miam/huo Date 1-11-18 Received by [Signature] Date 1/11/18
 Firm HEC Time 10:55 Firm CBE Time 1055
 Relinquished by _____ Date _____ Received by _____ Date _____
 Firm _____ Time _____ Firm _____ Time _____

Comments:
* - field filtered with 0.45 µm filter within 15 minutes of collecting sample

METER CALIBRATION LOG - Redmond Paired Watershed Study

| | | | |
|--|-----------------|-------|-------|
| Project Number: | 14-05806-000 | | |
| Personnel Performing Calibration: | Megan M. Alex J | | |
| Meter: | V Pro DSS II | | |
| Date/Time: | 1.10.10 16:30 | | |
| Barometric Pressure Start of Day: | mmHg: 759.8 | Time: | 10:30 |
| Barometric Pressure End of Day: | mmHg: 751.1 | Time: | 11:30 |

| |
|---|
| Calibration Procedures: |
| Rinse Multimeter Sonde Between Each Operation |
| Rinse 3 times with tap water, 3 times with deionized water, then 3 times with the solution to be used for calibrating or testing. |
| Conductivity Calibration Notes: |



| PRE Field Run CALIBRATION | Meter Reading | Buffer / Cal Std | Temp °C | Comments |
|---------------------------|-------------------------|------------------|---------|-----------------------|
| Conductivity (µS/cm) | 5.2 | 0 | 23.4 | lab DI water |
| Conductivity (µS/cm) | 1000 1001 | 1,000 | 23.6 | |
| Conductivity (µS/cm) | 100.0 | 100 | 23.2 | |
| DO % Saturation | 100.0 | 100 | 19.5 | calibrated, reads 100 |

| POST Field Run CHECK | Meter Reading | Buffer / Cal Std | Temp °C | Comments |
|----------------------|---------------|------------------|---------|--------------|
| Conductivity (µS/cm) | 1.0 | 0 | 22.7 | lab DI water |
| Conductivity (µS/cm) | 99.8 | 100 | 22.5 | |
| DO % Saturation | 100.0 | 100 | 21.8 | |

1. Dry the conductivity probe with a lab tissue (e.g., KimWipes®) and DI water.
2. Fill calibration cup to within a centimeter of the top of the calibration cup with DI water (0 µS).
3. Fill the calibration cup with 1,000 µS standard so that the temperature/conductivity probe is submerged.
4. Make sure there are no bubbles in the cell; wait 2 minutes.
5. Enter the appropriate standard value (1,000 µS/cm or 1.0 mS/cm) for Sp Cond.
6. Check conductivity using 100 µS/cm standard.

- Dissolved Oxygen Calibration Notes:**
1. Fill the calibration cup with about 1/2 inch of DI; it should be below the sensor cap.
 2. Use KimWipes® to dry any droplets from the sensor cap.
 3. Invert calibration cup's cap and gently rest it on the cup.
 4. Wait 5 minutes, making sure that temperature stabilizes.
 5. Determine local barometric pressure (mm Hg) and enter this value into the meter.
 6. Click "Calibrate". "Calibrate Successful" will be displayed.
 7. To retain calibration accuracy between measurements, store with the sensor immersed in water or within a water-saturated air environment such as a sealed storage cup with at least 10 ml of water.
 8. It is important to have the water-saturated air and the sensor at the same temperature. Therefore, store a jar of DI in the same environment as the sonde and calibrate in a similar air temperature as the water and sonde.
 9. Keep probe out of direct sun or wind.

METER CALIBRATION LOG - Redmond Paired Watershed Study



| | | | |
|-----------------------------------|-------------------|-------|-------|
| Project Number: | 14-05806-000 | | |
| Personnel Performing Calibration: | Michael M. ALEX S | | |
| Meter: | Pro DSS 2 | | |
| Date/Time: | 11-10-12 10:30 | | |
| Barometric Pressure Start of Day: | mmHg: 759.2 | Time: | 10:30 |
| Barometric Pressure End of Day: | mmHg: 751.1 | Time: | 11:30 |

| |
|---|
| Calibration Procedures: |
| Rinse Multimeter Sonde Between Each Operation |
| Rinse 3 times with tap water, 3 times with deionized water, then 3 times with the solution to be used for calibrating or testing. |
| Conductivity Calibration Notes: |

| PRE Field Run CALIBRATION | Meter Reading | Buffer / Cal Std | Temp °C | Comments |
|---------------------------|---------------|------------------|---------|--------------|
| Conductivity (µS/cm) | 4.0 | 0 | 23.7 | 100 DI water |
| Conductivity (µS/cm) | 1002 | 1,000 | 23.7 | |
| Conductivity (µS/cm) | 100.3 | 100 | 23.2 | |
| DO % Saturation | 100.0 | 100 | 20.2 | calibrated |

1. Dry the conductivity probe with a lab tissue (e.g., KimWipes®) and DI water.
2. Fill calibration cup to within a centimeter of the top of the calibration cup with DI water (0 µS).
3. Fill the calibration cup with 1,000 µS standard so that the temperature/conductivity probe is submerged.
4. Make sure there are no bubbles in the cell; wait 2 minutes.
5. Enter the appropriate standard value (1,000 µS/cm or 1.0 mS/cm) for Sp Cond.
6. Check conductivity using 100 µS/cm standard.

| POST Field Run CHECK | Meter Reading | Buffer / Cal Std | Temp °C | Comments |
|----------------------|---------------|------------------|---------|--------------|
| Conductivity (µS/cm) | 3.9 | 0 | 23.0 | 100 DI water |
| Conductivity (µS/cm) | 99.8 | 100 | 22.8 | |
| DO % Saturation | 98.8 | 100 | 22.0 | |

- Dissolved Oxygen Calibration Notes:**
1. Fill the calibration cup with about 1/2 inch of DI; it should be below the sensor cap.
 2. Use KimWipes® to dry any droplets from the sensor cap.
 3. Invert calibration cup's cap and gently rest it on the cup.
 4. Wait 5 minutes, making sure that temperature stabilizes.
 5. Determine local barometric pressure (mm Hg) and enter this value into the meter.
 6. Click "Calibrate". "Calibrate Successful" will be displayed.
 7. To retain calibration accuracy between measurements, store with the sensor immersed in water or within a water-saturated air environment such as a sealed storage cup with at least 10 ml of water.
 8. It is important to have the water-saturated air and the sensor at the same temperature. Therefore, store a jar of DI in the same environment as the sonde and calibrate in a similar air temperature as the water and sonde.
 9. Keep probe out of direct sun or wind.

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: M. MULLEN M. FELLER

Sample Date: 1.11.2018 Sample Time: 10:20

Base Flow or Storm Event? Field Filtered Time: 10:25
(Must filter within 15 minutes of collection)

SITE ID: COLM

Project Number: 14-05806-000

Project Name: Redmond Paired Watershed Study

Current Weather and Temp: RAINY 45°



Water Quality Sampling

Sample ID: COLM 2018 0111

| Parameter | Bottle Type | Bottle Volume | # Bottles | Preservative | Duplicated? |
|---------------------------|-------------|---------------|-----------|--------------------------------|-------------|
| TSS and Turbidity | HDPE | 1L | 1 | NA | No |
| DOC * | HDPE | 250 ml | 1 | HCL | |
| Fecal Col. Bact. | HDPE | 250 ml | 1 | EDTA | |
| T. Phosphorous | HDPE | 250 ml | 1 | H ₂ SO ₄ | |
| T. Nitrogen | HDPE | 250 ml | 1 | H ₂ SO ₄ | |
| Diss. Cu and Zn * | HDPE | 250 ml | 1 | HNO ₃ | |
| Hardness, Total Cu and Zn | HDPE | 500 ml | 1 | HNO ₃ | |

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID: _____
Filter blank sample ID: _____
Transfer blank sample ID: _____

Visual and Olfactory Conditions:

Clarity: CLEAR
Color: SLIGHT YELLOW / ORANGE
Odor: NO
Sheen: NO
Floatables: MINOR FOAM

LABORATORY DELIVERY

Date: _____ Time: _____

Quality Assurance

Checked By: J. Lantz Signature: [Signature]
Date Checked: 2-16-18 Time: _____
Data Entered into Database? YES NO Initials: _____
Date Entered: _____ Time: _____
Notes: _____

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

YSI Pro Plus (15D100020) _____
YSI Pro DSS 1 _____
YSI Pro DSS 2 _____

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): 6.43
Reference Point (description): SG

Water Quality Measurements

Temperature (°C) 4.9
Specific Conductivity (µs/cm) 25.2
Dissolved Oxygen (mg/L) 11.72

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: BB, JM

Sample Date: 1.11.18

Sample Time: 7:30

PDT:

SITE ID: WUM1

Base Flow or Storm Event? (circled)

Field Filtered Time: 7:35
(Must filter within 15 minutes of collection)

PST: X

Project Number: 14-05806-000



Project Name: Redmond Paired Watershed Study

Current Weather and Temp: Rain 43°F

Water Quality Sampling

Sample ID: WUM1-20180911

| Parameter | Bottle Type | Bottle Volume | # Bottles | Preservative | Duplicated? |
|---------------------------|-------------|---------------|-----------|--------------------------------|-------------|
| TSS and Turbidity | HDPE | 1L | 1 | NA | <u>N</u> |
| DOC * | HDPE | 250 ml | 1 | HCL | |
| Fecal Col. Bact. | HDPE | 250 ml | 1 | EDTA | |
| T. Phosphorous | HDPE | 250 ml | 1 | H ₂ SO ₄ | |
| T. Nitrogen | HDPE | 250 ml | 1 | H ₂ SO ₄ | |
| Diss. Cu and Zn * | HDPE | 250 ml | 1 | HNO ₃ | |
| Hardness, Total Cu and Zn | HDPE | 500 ml | 1 | HNO ₃ | |

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID: _____
 Filter blank sample ID: _____
 Transfer blank sample ID: _____

Visual and Olfactory Conditions:

Clarity: clear
 Color: none
 Odor: _____
 Sheen: _____
 Floatables: _____

LABORATORY DELIVERY

Date: _____ Time: _____

Quality Assurance

Checked By: S. Louch Signature: _____

Date Checked: 2-16-18 Time: _____

Data Entered into Database? YES / NO _____ initials: _____

Date Entered: _____ Time: _____

Notes: _____

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

YSI Pro Plus (15D100020) _____
 YSI Pro DSS 1 _____
 YSI Pro DSS 2 X

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): 2.83

Reference Point (description): SG

Water Quality Measurements

Temperature (°C) 7.1

Specific Conductivity (µs/cm) 131.9

Dissolved Oxygen (mg/L) 11.94

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: BB JM
 Sample Date: 1.11.18 Sample Time: 7:15 PDT:
 Base Flow or Storm Event? Field Filtered Time: 7:20 PST:
(Must filter within 15 minutes of collection)

SITE ID: WUUMO
 Project Number: 14-05806-000



Project Name: Redmond Paired Watershed Study
 Current Weather and Temp: Rain 42°F

Water Quality Sampling

Sample ID: WUUMO-2017011

| Parameter | Bottle Type | Bottle Volume | # Bottles | Preservative | Duplicated? |
|---------------------------|-------------|---------------|-----------|--------------------------------|-------------|
| TSS and Turbidity | HDPE | 1L | 1 | NA | ↕ |
| DOC * | HDPE | 250 ml | 1 | HCL | ↕ |
| Fecal Col. Bact. | HDPE | 250 ml | 1 | EDTA | ↕ |
| T. Phosphorous | HDPE | 250 ml | 1 | H ₂ SO ₄ | ↕ |
| T. Nitrogen | HDPE | 250 ml | 1 | H ₂ SO ₄ | ↕ |
| Diss. Cu and Zn * | HDPE | 250 ml | 1 | HNO ₃ | ↕ |
| Hardness, Total Cu and Zn | HDPE | 500 ml | 1 | HNO ₃ | ↕ |

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID: _____
 Filter blank sample ID: _____
 Transfer blank sample ID: _____

Visual and Olfactory Conditions:

Clarity: clear
 Color: none
 Odor: _____
 Sheen: _____
 Floatables: _____

LABORATORY DELIVERY

Date: _____ Time: _____

Quality Assurance

Checked By: S. Leuth Signature: [Signature]
 Date Checked: 2-16-18 Time: _____
 Data Entered into Database? YES / NO initials: _____
 Date Entered: _____ Time: _____
 Notes: _____

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

YSI Pro Plus (15D100020) _____
 YSI Pro DSS 1 _____
 YSI Pro DSS 2

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): 1.48
 Reference Point (description): SG

Water Quality Measurements

Temperature (°C) 7.1
 Specific Conductivity (µs/cm) 120.2
 Dissolved Oxygen (mg/L) 11.86

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: M. MULLEN, M. FEUER

Sample Date: 1.11.18

Sample Time: 8:20

PDT:

SITE ID: EVAMS

Base Flow or Storm Event?

Field Filtered Time: 8:25

PST:

Project Number: 14-05806-000

(Must filter within 15 minutes of collection)



Project Name: Redmond Paired Watershed Study

Current Weather and Temp: RAINY 43°

Water Quality Sampling

Sample ID: EVAMS 20180111

| Parameter | Bottle Type | Bottle Volume | # Bottles | Preservative | Duplicated? |
|---------------------------|-------------|---------------|-----------|--------------------------------|-------------|
| TSS and Turbidity | HDPE | 1L | 1 | NA | <u>No</u> |
| DOC * | HDPE | 250 ml | 1 | HCL | |
| Fecal Col. Bact. | HDPE | 250 ml | 1 | EDTA | |
| T. Phosphorous | HDPE | 250 ml | 1 | H ₂ SO ₄ | |
| T. Nitrogen | HDPE | 250 ml | 1 | H ₂ SO ₄ | |
| Diss. Cu and Zn * | HDPE | 250 ml | 1 | HNO ₃ | |
| Hardness, Total Cu and Zn | HDPE | 500 ml | 1 | HNO ₃ | |

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID:

Filter blank sample ID:

Transfer blank sample ID:

Visual and Olfactory Conditions:

Clarity: CLEAR

Color: SLIGHT YELLOW/TANNERS

Odor: NO

Sheen: NO

Floatables: SOME FOAM

LABORATORY DELIVERY

Date:

Time:

Quality Assurance

Checked By: J. Lenth

Signature: 

Date Checked: 2-16-18

Time:

Data Entered into Database?

YES

NO

initials:

Date Entered:

Time:

Notes:

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

YSI Pro Plus (15D100020)

YSI Pro DSS 1

YSI Pro DSS 2

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): 4.00

Reference Point (description): SG

Water Quality Measurements

Temperature (°C) 6.7

Specific Conductivity (µs/cm) 139.3

Dissolved Oxygen (mg/L) 11.84

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: M. MILLER, M. FRUIT

Sample Date: 1-11-18

Sample Time: 8:40

PDT:

SITE ID: EVALLS

Base Flow or Storm Event? Storm

Field Filtered Time: 8:45

PST: X

Project Number: 14-05806-000

(Must filter within 15 minutes of collection)



Project Name: Redmond Paired Watershed Study

Current Weather and Temp: RAINY 43°

Water Quality Sampling

Sample ID: EVALLS20180111

| Parameter | Bottle Type | Bottle Volume | # Bottles | Preservative | Duplicated? |
|---------------------------|-------------|---------------|-----------|--------------------------------|-------------|
| TSS and Turbidity | HDPE | 1L | 1 | NA | No |
| DOC * | HDPE | 250 ml | 1 | HCL | |
| Fecal Col. Bact. | HDPE | 250 ml | 1 | EDTA | |
| T. Phosphorous | HDPE | 250 ml | 1 | H ₂ SO ₄ | |
| T. Nitrogen | HDPE | 250 ml | 1 | H ₂ SO ₄ | |
| Diss. Cu and Zn * | HDPE | 250 ml | 1 | HNO ₃ | |
| Hardness, Total Cu and Zn | HDPE | 500 ml | 1 | HNO ₃ | |

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID:

Filter blank sample ID:

Transfer blank sample ID:

Visual and Olfactory Conditions:

Clarity: Clear
 Color: Slight Yellow
 Odor: No
 Sheen: No
 Floatables: No

LABORATORY DELIVERY

Date: _____ Time: _____

Quality Assurance

Checked By: J. Lenth

Signature: [Signature]

Date Checked: 2-16-18

Time:

Data Entered into Database? YES NO initials:

Date Entered: _____ Time: _____

Notes:

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

YSI Pro Plus (15D100020) _____

YSI Pro DSS 1 X _____

YSI Pro DSS 2 _____

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): 2.47

Reference Point (description): SA

Water Quality Measurements

Temperature (°C) 6.7

Specific Conductivity (µs/cm) 125.5

Dissolved Oxygen (mg/L) 12.17

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: BB JM
 Sample Date: 1.11.18 Sample Time: 9:00 PDT:
 Base Flow or Storm Event? Storm Event? Field Filtered Time: 9:05 PST: X
 (Must filter within 15 minutes of collection)

SITE ID: MONMN
 Project Number: 14-05806-000



Project Name: Redmond Paired Watershed Study
 Current Weather and Temp: Rain 43°F

Water Quality Sampling

Sample ID: MONMN-20180111

| Parameter | Bottle Type | Bottle Volume | # Bottles | Preservative | Duplicated? |
|---------------------------|-------------|---------------|-----------|--------------------------------|-------------|
| TSS and Turbidity | HDPE | 1L | 1 | NA | <u>N</u> |
| DOC * | HDPE | 250 ml | 1 | HCL | <u>N</u> |
| Fecal Col. Bact. | HDPE | 250 ml | 1 | EDTA | <u>N</u> |
| T. Phosphorous | HDPE | 250 ml | 1 | H ₂ SO ₄ | <u>N</u> |
| T. Nitrogen | HDPE | 250 ml | 1 | H ₂ SO ₄ | <u>N</u> |
| Diss. Cu and Zn * | HDPE | 250 ml | 1 | HNO ₃ | <u>N</u> |
| Hardness, Total Cu and Zn | HDPE | 500 ml | 1 | HNO ₃ | <u>N</u> |

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID: _____
 Filter blank sample ID: _____
 Transfer blank sample ID: _____

Visual and Olfactory Conditions:

Clarity: cloudy
 Color: none
 Odor: _____
 Sheen: _____
 Floatables: susp sed, org debris

LABORATORY DELIVERY

Date: _____ Time: _____

Quality Assurance

Checked By: S. Lenth Signature: [Signature]
 Date Checked: 2-10-18 Time: _____
 Data Entered into Database? YES NO initials: _____
 Date Entered: _____ Time: _____
 Notes: _____

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

YSI Pro Plus (15D100020) _____
 YSI Pro DSS 1 _____
 YSI Pro DSS 2 X

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): 9.52
 Reference Point (description): SG

Water Quality Measurements

Temperature (°C) 4.7
 Specific Conductivity (µs/cm) 110.4
 Dissolved Oxygen (mg/L) 11.78

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: BPB JMN
 Sample Date: 1.11.18 Sample Time: 9:15 PDT:
 Base Flow or Storm Event? Field Filtered Time: 9:20 PST:
(Must filter within 15 minutes of collection)

SITE ID: MONMS
 Project Number: 14-05806-000



Project Name: Redmond Paired Watershed Study

Current Weather and Temp: Rain 43°F

Water Quality Sampling

Sample ID: MONMS-20180111

| Parameter | Bottle Type | Bottle Volume | # Bottles | Preservative | Duplicated? |
|---------------------------|-------------|---------------|-----------|--------------------------------|-------------------------------------|
| TSS and Turbidity | HDPE | 1L | 1 | NA | <input checked="" type="checkbox"/> |
| DOC * | HDPE | 250 ml | 1 | HCL | <input checked="" type="checkbox"/> |
| Fecal Col. Bact. | HDPE | 250 ml | 1 | EDTA | <input checked="" type="checkbox"/> |
| T. Phosphorous | HDPE | 250 ml | 1 | H ₂ SO ₄ | <input checked="" type="checkbox"/> |
| T. Nitrogen | HDPE | 250 ml | 1 | H ₂ SO ₄ | <input checked="" type="checkbox"/> |
| Diss. Cu and Zn * | HDPE | 250 ml | 1 | HNO ₃ | <input checked="" type="checkbox"/> |
| Hardness, Total Cu and Zn | HDPE | 500 ml | 1 | HNO ₃ | <input checked="" type="checkbox"/> |

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter pad vacuum hand pump

Duplicate sample ID: _____
 Filter blank sample ID: _____
 Transfer blank sample ID: _____

Visual and Olfactory Conditions:

Clarity: clear
 Color: none
 Odor: _____
 Sheen: _____
 Floatables: _____

LABORATORY DELIVERY

Date: _____ Time: _____

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

YSI Pro Plus (15D100020) _____
 YSI Pro DSS 1 _____
 YSI Pro DSS 2

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): 0.37

Reference Point (description): vault

Water Quality Measurements

Temperature (°C) 6.5

Specific Conductivity (µs/cm) 151.8

Dissolved Oxygen (mg/L) 0.62

Quality Assurance

Checked By: [Signature] Signature: _____
 Date Checked: 2-16-18 Time: _____
 Data Entered into Database? YES NO initials: _____
 Date Entered: _____ Time: _____
 Notes: _____

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: BB JM
 Sample Date: 1.11.18 Sample Time: 10:10 PDT:
 Base Flow or Storm Event? Field Filtered Time: 10:15 PST:
 (Must filter within 15 minutes of collection)

SITE ID: MONM
 Project Number: 14-05806-000



Project Name: Redmond Paired Watershed Study
 Current Weather and Temp: Rain 43°F

Water Quality Sampling

Sample ID: MONM-20180111

| Parameter | Bottle Type | Bottle Volume | # Bottles | Preservative | Duplicated? |
|---------------------------|-------------|---------------|-----------|--------------------------------|-------------|
| TSS and Turbidity | HDPE | 1L | 1 | NA | N ↓ V |
| DOC * | HDPE | 250 ml | 1 | HCL | |
| Fecal Col. Bact. | HDPE | 250 ml | 1 | EDTA | |
| T. Phosphorous | HDPE | 250 ml | 1 | H ₂ SO ₄ | |
| T. Nitrogen | HDPE | 250 ml | 1 | H ₂ SO ₄ | |
| Diss. Cu and Zn * | HDPE | 250 ml | 1 | HNO ₃ | |
| Hardness, Total Cu and Zn | HDPE | 500 ml | 1 | HNO ₃ | |

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID:
 Filter blank sample ID:
 Transfer blank sample ID:

Visual and Olfactory Conditions:

Clarity: cloudy
 Color: none
 Odor:
 Sheen:
 Floatables: 250 µg sed

LABORATORY DELIVERY

Date: Time:

Quality Assurance

Checked By: J. Leuth Signature: [Signature]
 Date Checked: 2-16-18 Time:
 Data Entered into Database? YES NO initials:
 Date Entered: Time:
 Notes:

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

YSI Pro Plus (15D100020)
 YSI Pro DSS 1
 YSI Pro DSS 2

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): NA
 Reference Point (description): NA

Water Quality Measurements

Temperature (°C) 10.7
 Specific Conductivity (µs/cm) 114.0
 Dissolved Oxygen (mg/L) 12.16

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: M. MULLER, M. FELLER

Sample Date: 1.11.18

Sample Time: 9:50

PDT:

SITE

ID: SEIMN

Base Flow or Storm Event?

Field Filtered Time: 9:55

PST:

Project Number: 14-05806-000

(Must filter within 15 minutes of collection)

Project Name: Redmond Paired Watershed Study



Current Weather and Temp: RAINY 43°

Water Quality Sampling

Sample ID: SEIMN20180111

| Parameter | Bottle Type | Bottle Volume | # Bottles | Preservative | Duplicated? |
|---------------------------|-------------|---------------|-----------|--------------------------------|-------------|
| TSS and Turbidity | HDPE | 1L | 1 | NA | <u>NO</u> |
| DOC * | HDPE | 250 ml | 1 | HCL | |
| Fecal Col. Bact. | HDPE | 250 ml | 1 | EDTA | |
| T. Phosphorous | HDPE | 250 ml | 1 | H ₂ SO ₄ | |
| T. Nitrogen | HDPE | 250 ml | 1 | H ₂ SO ₄ | |
| Diss. Cu and Zn * | HDPE | 250 ml | 1 | HNO ₃ | |
| Hardness, Total Cu and Zn | HDPE | 500 ml | 1 | HNO ₃ | |

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID:

Filter blank sample ID:

Transfer blank sample ID:

Visual and Olfactory Conditions:

Clarity: SLIGHTLY TURBID/CLOUDY

Color: CLEAR

Odor: NO

Sheen: NO

Floatables: NO

LABORATORY DELIVERY

Date:

Time:

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

YSI Pro Plus (15D100020)

YSI Pro DSS 1

YSI Pro DSS 2

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): 5.25"

Reference Point (description): TOP OF GOLT

Water Quality Measurements

Temperature (°C) 6.0

Specific Conductivity (µs/cm) 37.5

Dissolved Oxygen (mg/L) 12.19

Quality Assurance

Checked By: S. Lentz

Signature:

Date Checked: 2-16-19

Time:

Data Entered into Database?

YES

NO

initials:

Date Entered:

Time:

Notes:

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: BB JM
 Sample Date: 1.11.18 Sample Time: 9:50 PDT: _____
 Base Flow or Storm Event? _____ Field Filtered Time: 9:55 PST:
 (Must filter within 15 minutes of collection)

SITE ID: SEIMS
 Project Number: 14-05806-000



Project Name: Redmond Paired Watershed Study
 Current Weather and Temp: Rain 42°F

Water Quality Sampling

Sample ID: SEIMS-20180111

| Parameter | Bottle Type | Bottle Volume | # Bottles | Preservative | Duplicated? |
|---------------------------|-------------|---------------|-----------|--------------------------------|-------------|
| TSS and Turbidity | HDPE | 1L | 1 | NA | N |
| DOC * | HDPE | 250 ml | 1 | HCL | |
| Fecal Col. Bact. | HDPE | 250 ml | 1 | EDTA | |
| T. Phosphorous | HDPE | 250 ml | 1 | H ₂ SO ₄ | |
| T. Nitrogen | HDPE | 250 ml | 1 | H ₂ SO ₄ | |
| Diss. Cu and Zn * | HDPE | 250 ml | 1 | HNO ₃ | |
| Hardness, Total Cu and Zn | HDPE | 500 ml | 1 | HNO ₃ | |

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID: _____
 Filter blank sample ID: _____
 Transfer blank sample ID: _____

Visual and Olfactory Conditions:

Clarity: cloudy
 Color: light brown
 Odor: none
 Sheen: _____
 Floatables: ↓ susp sed, org debris
 LABORATORY DELIVERY

Date: _____ Time: _____

Quality Assurance

Checked By: S. Lenth Signature: [Signature]
 Date Checked: 2-16-18 Time: _____
 Data Entered into Database? YES NO initials: _____
 Date Entered: _____ Time: _____
 Notes: _____

Field Meter Calibration

Check which field meter was used and complete the meter calibration form
 YSI Pro Plus (15D100020) _____
 YSI Pro DSS 1 _____
 YSI Pro DSS 2

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)
 Stream Stage (ft): 1.00
 Reference Point (description): SG

Water Quality Measurements

Temperature (°C) 10.4
 Specific Conductivity (µs/cm) 58.3
 Dissolved Oxygen (mg/L) 11.53

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: M. Miller, M. Feller
 Sample Date: 1-11-18 Sample Time: 7:30 PDT:
 Base Flow or Storm Event? Field Filtered Time: 7:35 PST:
 (Must filter within 15 minutes of collection)

SITE ID: TOSM1
 Project Number: 14-05806-000



Project Name: Redmond Paired Watershed Study
 Current Weather and Temp: rainy 43°

Water Quality Sampling

Sample ID: TOSM1 201811

| Parameter | Bottle Type | Bottle Volume | # Bottles | Preservative | Duplicated? |
|---------------------------|-------------|---------------|-----------|--------------------------------|-------------|
| TSS and Turbidity | HDPE | 1L | 1 | NA | NO |
| DOC * | HDPE | 250 ml | 1 | HCL | |
| Fecal Col. Bact. | HDPE | 250 ml | 1 | EDTA | |
| T. Phosphorous | HDPE | 250 ml | 1 | H ₂ SO ₄ | |
| T. Nitrogen | HDPE | 250 ml | 1 | H ₂ SO ₄ | |
| Diss. Cu and Zn * | HDPE | 250 ml | 1 | HNO ₃ | |
| Hardness, Total Cu and Zn | HDPE | 500 ml | 1 | HNO ₃ | |

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID: _____
 Filter blank sample ID: _____
 Transfer blank sample ID: _____

Visual and Olfactory Conditions:

Clarity: clear
 Color: no
 Odor: no
 Sheen: no
 Floatables: no

LABORATORY DELIVERY

Date: _____ Time: _____

Quality Assurance

Checked By: S. Lenth Signature: [Signature]
 Date Checked: 2-16-18 Time: _____
 Data Entered into Database? YES NO initials: _____
 Date Entered: _____ Time: _____
 Notes: _____

Field Meter Calibration

Check which field meter was used and complete the meter calibration form
YSI Pro Plus (15D100020)
YSI Pro DSS 1
YSI Pro DSS 2

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)
 Stream Stage (ft): 0.96
 Reference Point (description): SG

Water Quality Measurements

Temperature (°C) 6.8
 Specific Conductivity (µs/cm) 729
 Dissolved Oxygen (mg/L) 12.09

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: BAB JM
 Sample Date: 1.11.18 Sample Time: 7:45 PDT
 Base Flow or Storm Event? Field Filtered Time: 7:50 PST:
 (Must filter within 15 minutes of collection)

SITE ID: TOSMO
 Project Number: 14-05806-000



Project Name: Redmond Paired Watershed Study
 Current Weather and Temp: Rain 43°F

Water Quality Sampling

Sample ID: TOSMO-20180111

| Parameter | Bottle Type | Bottle Volume | # Bottles | Preservative | Duplicated? |
|---------------------------|-------------|---------------|-----------|--------------------------------|-------------------------------------|
| TSS and Turbidity | HDPE | 1L | 1 | NA | <input checked="" type="checkbox"/> |
| DOC * | HDPE | 250 ml | 1 | HCL | <input checked="" type="checkbox"/> |
| Fecal Col. Bact. | HDPE | 250 ml | 1 | EDTA | <input checked="" type="checkbox"/> |
| T. Phosphorous | HDPE | 250 ml | 1 | H ₂ SO ₄ | <input checked="" type="checkbox"/> |
| T. Nitrogen | HDPE | 250 ml | 1 | H ₂ SO ₄ | <input checked="" type="checkbox"/> |
| Diss. Cu and Zn * | HDPE | 250 ml | 1 | HNO ₃ | <input checked="" type="checkbox"/> |
| Hardness, Total Cu and Zn | HDPE | 500 ml | 1 | HNO ₃ | <input checked="" type="checkbox"/> |

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID: QA40-20180111 @ 7:55
 Filter blank sample ID: NA
 Transfer blank sample ID: NA

Visual and Olfactory Conditions:
 Clarity: clear cloudy
 Color: none
 Odor:
 Sheen:
 Floatables: ↓ susp sed, org debris
LABORATORY DELIVERY

Date: _____ Time: _____

Quality Assurance

Checked By: Z. Lenth Signature: [Signature]
 Date Checked: 2-16-18 Time: _____
 Data Entered into Database? YES NO initials:
 Date Entered: _____ Time: _____
 Notes: _____

Field Meter Calibration

Check which field meter was used and complete the meter calibration form
 YSI Pro Plus (15D100020) _____
 YSI Pro DSS 1 _____
 YSI Pro DSS 2

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)
 Stream Stage (ft): 0.83
 Reference Point (description): SG

Water Quality Measurements

Temperature (°C) 7.2
 Specific Conductivity (µs/cm) 98.0
 Dissolved Oxygen (mg/L) 12.02

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: BB JM
 Sample Date: 1.11.18 Sample Time: 7:30 PDT:
 Base Flow or Storm Event? Storm Event? Field Filtered Time: 7:35 PST:
(Must filter within 15 minutes of collection)

SITE ID: TYLMI
 Project Number: 14-05806-000



Water Quality Sampling

Sample ID: TYLMI-20180111

Project Name: Redmond Paired Watershed Study
 Current Weather and Temp: Rain 43°F

| Parameter | Bottle Type | Bottle Volume | # Bottles | Preservative | Duplicated? |
|---------------------------|-------------|---------------|-----------|--------------------------------|-------------------------------------|
| TSS and Turbidity | HDPE | 1L | 1 | NA | <input checked="" type="checkbox"/> |
| DOC * | HDPE | 250 ml | 1 | HCL | <input checked="" type="checkbox"/> |
| Fecal Col. Bact. | HDPE | 250 ml | 1 | EDTA | <input checked="" type="checkbox"/> |
| T. Phosphorous | HDPE | 250 ml | 1 | H ₂ SO ₄ | <input checked="" type="checkbox"/> |
| T. Nitrogen | HDPE | 250 ml | 1 | H ₂ SO ₄ | <input checked="" type="checkbox"/> |
| Diss. Cu and Zn * | HDPE | 250 ml | 1 | HNO ₃ | <input checked="" type="checkbox"/> |
| Hardness, Total Cu and Zn | HDPE | 500 ml | 1 | HNO ₃ | <input checked="" type="checkbox"/> |

Field Meter Calibration

Check which field meter was used and complete the meter calibration form
 YSI Pro Plus (15D100020) _____
 YSI Pro DSS 1 _____
 YSI Pro DSS 2

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)
 Stream Stage (ft): 4.45
 Reference Point (description): top of culvert

Water Quality Measurements

Temperature (°C) 6.5
 Specific Conductivity (µs/cm) 83.2
 Dissolved Oxygen (mg/L) 11.77

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID: _____
 Filter blank sample ID: _____
 Transfer blank sample ID: _____

Visual and Olfactory Conditions:
 Clarity: clear
 Color: none
 Odor: _____
 Sheen: _____
 Floatables: _____

LABORATORY DELIVERY

Date: _____ Time: _____

Quality Assurance

Checked By: J. Lenth Signature: _____
 Date Checked: 2-16-18 Time: _____
 Data Entered into Database? YES NO initials: _____
 Date Entered: _____ Time: _____
 Notes: _____

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: BB JM
 Sample Date: 1.11.18 Sample Time: 8:15 PDT:
 Base Flow or Storm Event? (Storm Event?) Field Filtered Time: 8:20 PST:
 (Must filter within 15 minutes of collection)

SITE ID: TYLMO
 Project Number: 14-05806-000



Project Name: Redmond Paired Watershed Study
 Current Weather and Temp: Rain 43°F

Water Quality Sampling

Sample ID: TYLMO-20180111

| Parameter | Bottle Type | Bottle Volume | # Bottles | Preservative | Duplicated? |
|---------------------------|-------------|---------------|-----------|--------------------------------|-------------|
| TSS and Turbidity | HDPE | 1L | 1 | NA | <u>N</u> |
| DOC * | HDPE | 250 ml | 1 | HCL | <u>Y</u> |
| Fecal Col. Bact. | HDPE | 250 ml | 1 | EDTA | <u>Y</u> |
| T. Phosphorous | HDPE | 250 ml | 1 | H ₂ SO ₄ | <u>Y</u> |
| T. Nitrogen | HDPE | 250 ml | 1 | H ₂ SO ₄ | <u>Y</u> |
| Diss. Cu and Zn * | HDPE | 250 ml | 1 | HNO ₃ | <u>Y</u> |
| Hardness, Total Cu and Zn | HDPE | 500 ml | 1 | HNO ₃ | <u>Y</u> |

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID: _____
 Filter blank sample ID: _____
 Transfer blank sample ID: _____

Visual and Olfactory Conditions:

Clarity: clear
 Color: none
 Odor: _____
 Sheen: _____
 Floatables: _____

LABORATORY DELIVERY

Date: _____ Time: _____

Quality Assurance

Checked By: [Signature] Signature: _____
 Date Checked: 2-16-18 Time: _____
 Data Entered into Database? YES NO initials: _____
 Date Entered: _____ Time: _____
 Notes: _____

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

YSI Pro Plus (15D100020) _____
 YSI Pro DSS 1 _____
 YSI Pro DSS 2

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): 2.78
 Reference Point (description): 3 top of culvert 1

Water Quality Measurements

Temperature (°C) 10.7
 Specific Conductivity (µs/cm) 70.0
 Dissolved Oxygen (mg/L) 12.02



HERRERA

Data Quality Assurance Worksheet

Project Name/No./Client: Redmond Paired Watershed Study / 14-05806-000 / City of Redmond

Laboratory/Parameters: OnSite Environmental : TSS, turbidity, hardness, DOC, TP, Dissolved & Total Cu, Zn / AmTest: Total nitrogen, fecal coliform bacteria

Sample Date/Sample ID: 1/11/2018 / All sites, 1 FD (QA40) at TOSMI

By G. Catarra

Date 2/7/2018 Page 1 of 2

Checked: initials JL

date 2/16/2048

| Parameter | Completeness/ Methodology | Pre-preservation Holding Times (minutes) | | Total Holding Times (days) | | Method Blanks Reporting Limit | Matrix Spikes/ Surrogate Recovery (%) | | Lab Control Samples Recovery (%) | | Lab Duplicates RPD (%) | | Field Duplicates RPD (%) | | Instrument Calibration/ Performance | ACTION |
|-------------------------------------|------------------------------|--|------|-------------------------------|------|--|---|-------------------|--|-------------------|---------------------------|-------------------|-----------------------------|-------------------|---|--------|
| | | Reported | Goal | Reported | Goal | | Reported | Goal ¹ | Reported | Goal ¹ | Reported | Goal ¹ | Reported | Goal ¹ | | |
| TSS | OK / SM 2540D | NA | NA | 5 | ≤7 | ≤1.0 mg/L 1.0 mg/L | NA | NA | 94 | ±20 | 14 | ≤25 | 2.5 | ≤25 | OK | NONE |
| Turbidity | OK / EPA 180.1 | NA | NA | 1 | ≤2 | ≤0.1 NTU 0.1 NTU | NA | NA | NA | ±10 | 1 | ≤25 | 21 | ≤25 | OK | NONE |
| Hardness | OK / SM 2340B | NA | NA | 7 | ≤180 | ≤1.0 mg/L 1.0 mg/L | 102,99 | ±25 | 101 | ±15 | 3 | ≤20 | 2.3 | ≤20 | OK | NONE |
| DOC | OK / SM 5310B | <15 | ≤15 | 6 | ≤28 | ≤1.0 mg/L 1.0 mg/L | 94 | ±25 | 99 | ±15 | 2 | ≤20 | 2.4 | ≤20 | OK | NONE |
| Total Phosphorus | OK / EPA 365.1 | NA | NA | 7 | ≤28 | ≤0.01 mg/L 0.01 mg/L | 89 | ±25 | 105 | ±20 | 7 | ≤20 | D=0.016 | ≤20 | OK | NONE |
| Total Nitrogen (TKN + N+N) | OK/ SM 4500 N-B | NA | NA | 11,12 | ≤28 | ≤0.1 mg/L 0.1 mg/L | 93,94 | ±25 | 96-100 | ±20 | 0-14 | ≤20 | 0, 5.7 | ≤20 | OK | NONE |

¹ If the sample or duplicate value is less than five times the reporting limit, the difference is calculated rather than the relative percent difference (RPD). The QA goal is a difference <2 times the detection limit instead of the number indicated in the goal column.

NA – not applicable or not available; NC – not calculable due to one or more values below the detection limit; NS – field duplicate not sampled.



Data Quality Assurance Worksheet

By G. Catarra

Project Name/No./Client: Redmond Paired Watershed Study / 14-05806-000 / City of Redmond

Date 2/07/2018 Page 2 of 2

Laboratory/Parameters: OnSite Environmental : TSS, turbidity, hardness, DOC, TP, Dissolved & Total Cu, Zn / AmTest: total nitrogen, fecal coliform bacteria

Checked: initials
JL

Sample Date/Sample ID: 1/11/2018 / All sites, 1 FD (QA40) at TOSMI

date 2/16/2018

| Parameter | Completeness/ Methodology | Pre-preservation Holding Times (minutes) | | Total Holding Times (days) | | Method Blanks Reporting Limit | Matrix Spikes/ Surrogate Recovery (%) | | Lab Control Samples Recovery (%) | | Lab Duplicates RPD (%) | | Field Duplicates RPD (%) | | Instrument Calibration/ Performance | ACTION |
|------------------|------------------------------|--|------|-------------------------------|------|--|---|-------------------|--|------|---------------------------|-------------------|-----------------------------|-------------------|---|---|
| | | Reported | Goal | Reported | Goal | | Reported | Goal ¹ | Reported | Goal | Reported | Goal ¹ | Reported | Goal ¹ | | |
| Total Copper | OK/ EPA 200.8 | NA | NA | 6 | ≤180 | ≤1.0 µg/L 1.0 µg/L | 100,100 | ±25 | NR | ±15 | 2 | ≤20 | D=0.6 | ≤20 | OK | NONE |
| Total Zinc | OK/ EPA 200.8 | NA | NA | 6 | ≤180 | ≤5.0 µg/L 5.0 µg/L | 117,116 | ±25 | NR | ±15 | 1 | ≤20 | 2.0 | ≤20 | OK | NONE |
| Dissolved Copper | OK/ EPA 200.8 | <15 | ≤15 | 6 | ≤180 | ≤1.0 µg/L 1.0 µg/L | 88,95 | ±25 | NR | ±15 | 2 | ≤20 | D=0.1 | ≤20 | OK | NONE |
| Dissolved Zinc | OK/ EPA 200.8 | <15 | ≤15 | 6 | ≤180 | ≤5.0 µg/L 5.0 µg/L | 107,111 | ±25 | NR | ±15 | 1 | ≤20 | 12 | ≤20 | OK | NONE |
| Fecal Coliform | OK/ SM 9222D | NA | NA | <1 | ≤1 | ≤1.0 cfu/ 100mL 10 cfu/ 100mL | NA | NA | NA | NA | 63,29 | ≤35 | 15 | ≤50 | OK | FLAG COLM "J" DUE TO LAB DUPLICATE RPD |

¹ If the sample or duplicate value is less than five times the reporting limit, the difference is calculated rather than the relative percent difference (RPD). The QA goal is a difference <2 times the detection limit instead of the number indicated in the goal column.

NA – not applicable or not available; NC – not calculable due to one or more values below the detection limit; NS – field duplicate not sampled.



14648 NE 95th Street, Redmond, WA 98052 • (425) 883-3881

February 9, 2018

George Iftner
Herrera Environmental Consultants, Inc.
2200 6th Avenue, Suite 1100
Seattle, WA 98121

Re: Analytical Data for Project 14-05806-000
Laboratory Reference No. 1801-190

Dear George:

Enclosed are the analytical results and associated quality control data for samples submitted on January 17, 2018.

The standard policy of OnSite Environmental, Inc. is to store your samples for 30 days from the date of receipt. If you require longer storage, please contact the laboratory.

We appreciate the opportunity to be of service to you on this project. If you have any questions concerning the data, or need additional information, please feel free to call me.

Sincerely,

A handwritten signature in black ink, appearing to read "Blair Goodrow", enclosed within a large, loopy circular flourish.

Blair Goodrow
Project Manager

Enclosures



OnSite Environmental, Inc. 14648 NE 95th Street, Redmond, WA 98052 (425) 883-3881

This report pertains to the samples analyzed in accordance with the chain of custody, and is intended only for the use of the individual or company to whom it is addressed.

Date of Report: February 9, 2018
Samples Submitted: January 17, 2018
Laboratory Reference: 1801-190
Project: 14-05806-000

Case Narrative

Samples were collected on January 17, 2018 and received by the laboratory on January 17, 2018. They were maintained at the laboratory at a temperature of 2°C to 6°C.

Please note that any and all soil sample results are reported on a dry-weight basis, unless otherwise noted below.

General QA/QC issues associated with the analytical data enclosed in this laboratory report will be indicated with a reference to a comment or explanation on the Data Qualifier page. More complex and involved QA/QC issues will be discussed in detail below.



Date of Report: February 9, 2018
 Samples Submitted: January 17, 2018
 Laboratory Reference: 1801-190
 Project: 14-05806-000

**TOTAL SUSPENDED SOLIDS
SM 2540D**

Matrix: Water
 Units: mg/L

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|------------------------|----------------------|-----|----------|---------------|---------------|-------|
| Client ID: | COLM-20180117 | | | | | |
| Laboratory ID: | 01-190-01 | | | | | |
| Total Suspended Solids | 4.4 | 1.0 | SM 2540D | 1-24-18 | 1-25-18 | |

| | | | | | | |
|------------------------|-----------------------|-----|----------|---------|---------|--|
| Client ID: | COUMI-20180117 | | | | | |
| Laboratory ID: | 01-190-02 | | | | | |
| Total Suspended Solids | 73 | 1.7 | SM 2540D | 1-24-18 | 1-25-18 | |

| | | | | | | |
|------------------------|-----------------------|-----|----------|---------|---------|--|
| Client ID: | COUMO-20180117 | | | | | |
| Laboratory ID: | 01-190-03 | | | | | |
| Total Suspended Solids | 99 | 1.7 | SM 2540D | 1-24-18 | 1-25-18 | |

| | | | | | | |
|------------------------|-----------------------|-----|----------|---------|---------|--|
| Client ID: | EVAMS-20180117 | | | | | |
| Laboratory ID: | 01-190-04 | | | | | |
| Total Suspended Solids | 15 | 1.0 | SM 2540D | 1-24-18 | 1-25-18 | |

| | | | | | | |
|------------------------|------------------------|-----|----------|---------|---------|--|
| Client ID: | EVALSS-20180117 | | | | | |
| Laboratory ID: | 01-190-05 | | | | | |
| Total Suspended Solids | 20 | 1.0 | SM 2540D | 1-24-18 | 1-25-18 | |

| | | | | | | |
|------------------------|-----------------------|-----|----------|---------|---------|--|
| Client ID: | MONMN-20180117 | | | | | |
| Laboratory ID: | 01-190-06 | | | | | |
| Total Suspended Solids | 43 | 1.7 | SM 2540D | 1-24-18 | 1-25-18 | |

| | | | | | | |
|------------------------|-----------------------|-----|----------|---------|---------|--|
| Client ID: | MONMS-20180117 | | | | | |
| Laboratory ID: | 01-190-07 | | | | | |
| Total Suspended Solids | 13 | 1.0 | SM 2540D | 1-24-18 | 1-25-18 | |



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**TOTAL SUSPENDED SOLIDS
 SM 2540D**

Matrix: Water
 Units: mg/L

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|------------------------|----------------------|-----|----------|---------------|---------------|-------|
| Client ID: | MONM-20180117 | | | | | |
| Laboratory ID: | 01-190-08 | | | | | |
| Total Suspended Solids | 33 | 1.0 | SM 2540D | 1-24-18 | 1-25-18 | |

| | | | | | | |
|------------------------|-----------------------|-----|----------|---------|---------|--|
| Client ID: | SEIMN-20180117 | | | | | |
| Laboratory ID: | 01-190-09 | | | | | |
| Total Suspended Solids | 80 | 1.7 | SM 2540D | 1-24-18 | 1-25-18 | |

| | | | | | | |
|------------------------|-----------------------|-----|----------|---------|---------|--|
| Client ID: | SEIMS-20180117 | | | | | |
| Laboratory ID: | 01-190-10 | | | | | |
| Total Suspended Solids | 49 | 1.7 | SM 2540D | 1-24-18 | 1-25-18 | |

| | | | | | | |
|------------------------|-----------------------|-----|----------|---------|---------|--|
| Client ID: | TOSMI-20180117 | | | | | |
| Laboratory ID: | 01-190-11 | | | | | |
| Total Suspended Solids | 250 | 1.7 | SM 2540D | 1-24-18 | 1-25-18 | |

| | | | | | | |
|------------------------|-----------------------|-----|----------|---------|---------|--|
| Client ID: | TOSMO-20180117 | | | | | |
| Laboratory ID: | 01-190-12 | | | | | |
| Total Suspended Solids | 370 | 2.5 | SM 2540D | 1-24-18 | 1-25-18 | |

| | | | | | | |
|------------------------|-----------------------|-----|----------|---------|---------|--|
| Client ID: | TYLMI-20180117 | | | | | |
| Laboratory ID: | 01-190-13 | | | | | |
| Total Suspended Solids | 35 | 1.0 | SM 2540D | 1-24-18 | 1-25-18 | |

| | | | | | | |
|------------------------|-----------------------|-----|----------|---------|---------|--|
| Client ID: | TYLMO-20180117 | | | | | |
| Laboratory ID: | 01-190-14 | | | | | |
| Total Suspended Solids | 55 | 1.7 | SM 2540D | 1-24-18 | 1-25-18 | |



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TOTAL SUSPENDED SOLIDS
SM 2540D

Matrix: Water
Units: mg/L

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|------------------------|-----------------------|------------|---------------|----------------------|----------------------|--------------|
| Client ID: | QA-41-20180117 | | | | | |
| Laboratory ID: | 01-190-15 | | | | | |
| Total Suspended Solids | 23 | 1.0 | SM 2540D | 1-24-18 | 1-25-18 | |



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**TOTAL SUSPENDED SOLIDS
 SM 2540D
 QUALITY CONTROL**

Matrix: Water
 Units: mg/L

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|------------------------|-----------|-----|----------|---------------|---------------|-------|
| METHOD BLANK | | | | | | |
| Laboratory ID: | MB0124W1 | | | | | |
| Total Suspended Solids | ND | 1.0 | SM 2540D | 1-24-18 | 1-25-18 | |

| Analyte | Result | Spike Level | Source Result | Percent Recovery | Recovery Limits | RPD | RPD Limit | Flags |
|------------------------|-------------|-------------|---------------|------------------|-----------------|-----|-----------|-------|
| DUPLICATE | | | | | | | | |
| Laboratory ID: | 01-198-01 | | | | | | | |
| | ORIG | DUP | | | | | | |
| Total Suspended Solids | 11.0 | 11.0 | NA | NA | NA | NA | 0 | 17 |

| | | | | | | | | |
|------------------------|-------------|-----|----|----|--------|----|----|--|
| SPIKE BLANK | | | | | | | | |
| Laboratory ID: | SB0124W1 | | | | | | | |
| | SB | SB | | SB | | | | |
| Total Suspended Solids | 96.0 | 100 | NA | 96 | 76-114 | NA | NA | |



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TURBIDITY
EPA 180.1

Matrix: Water
 Units: NTU

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|-------------------|----------------------|------|-----------|---------------|---------------|-------|
| Client ID: | COLM-20180117 | | | | | |
| Laboratory ID: | 01-190-01 | | | | | |
| Turbidity | 1.1 | 0.10 | EPA 180.1 | 1-18-18 | 1-18-18 | |

| | | | | | | |
|-------------------|-----------------------|------|-----------|---------|---------|--|
| Client ID: | COUMI-20180117 | | | | | |
| Laboratory ID: | 01-190-02 | | | | | |
| Turbidity | 15 | 0.10 | EPA 180.1 | 1-18-18 | 1-18-18 | |

| | | | | | | |
|-------------------|-----------------------|------|-----------|---------|---------|--|
| Client ID: | COUMO-20180117 | | | | | |
| Laboratory ID: | 01-190-03 | | | | | |
| Turbidity | 19 | 0.10 | EPA 180.1 | 1-18-18 | 1-18-18 | |

| | | | | | | |
|-------------------|-----------------------|------|-----------|---------|---------|--|
| Client ID: | EVAMS-20180117 | | | | | |
| Laboratory ID: | 01-190-04 | | | | | |
| Turbidity | 3.1 | 0.10 | EPA 180.1 | 1-18-18 | 1-18-18 | |

| | | | | | | |
|-------------------|------------------------|------|-----------|---------|---------|--|
| Client ID: | EVALSS-20180117 | | | | | |
| Laboratory ID: | 01-190-05 | | | | | |
| Turbidity | 4.8 | 0.10 | EPA 180.1 | 1-18-18 | 1-18-18 | |

| | | | | | | |
|-------------------|-----------------------|------|-----------|---------|---------|--|
| Client ID: | MONMN-20180117 | | | | | |
| Laboratory ID: | 01-190-06 | | | | | |
| Turbidity | 24 | 0.10 | EPA 180.1 | 1-18-18 | 1-18-18 | |

| | | | | | | |
|-------------------|-----------------------|------|-----------|---------|---------|--|
| Client ID: | MONMS-20180117 | | | | | |
| Laboratory ID: | 01-190-07 | | | | | |
| Turbidity | 5.6 | 0.10 | EPA 180.1 | 1-18-18 | 1-18-18 | |



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TURBIDITY
EPA 180.1

Matrix: Water
 Units: NTU

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|-------------------|----------------------|------|-----------|---------------|---------------|-------|
| Client ID: | MONM-20180117 | | | | | |
| Laboratory ID: | 01-190-08 | | | | | |
| Turbidity | 11 | 0.10 | EPA 180.1 | 1-18-18 | 1-18-18 | |

| | | | | | | |
|-------------------|-----------------------|------|-----------|---------|---------|--|
| Client ID: | SEIMN-20180117 | | | | | |
| Laboratory ID: | 01-190-09 | | | | | |
| Turbidity | 13 | 0.10 | EPA 180.1 | 1-18-18 | 1-18-18 | |

| | | | | | | |
|-------------------|-----------------------|------|-----------|---------|---------|--|
| Client ID: | SEIMS-20180117 | | | | | |
| Laboratory ID: | 01-190-10 | | | | | |
| Turbidity | 6.4 | 0.10 | EPA 180.1 | 1-18-18 | 1-18-18 | |

| | | | | | | |
|-------------------|-----------------------|------|-----------|---------|---------|--|
| Client ID: | TOSMI-20180117 | | | | | |
| Laboratory ID: | 01-190-11 | | | | | |
| Turbidity | 31 | 0.10 | EPA 180.1 | 1-18-18 | 1-18-18 | |

| | | | | | | |
|-------------------|-----------------------|------|-----------|---------|---------|--|
| Client ID: | TOSMO-20180117 | | | | | |
| Laboratory ID: | 01-190-12 | | | | | |
| Turbidity | 45 | 0.10 | EPA 180.1 | 1-18-18 | 1-18-18 | |

| | | | | | | |
|-------------------|-----------------------|------|-----------|---------|---------|--|
| Client ID: | TYLMI-20180117 | | | | | |
| Laboratory ID: | 01-190-13 | | | | | |
| Turbidity | 8.9 | 0.10 | EPA 180.1 | 1-18-18 | 1-18-18 | |

| | | | | | | |
|-------------------|-----------------------|------|-----------|---------|---------|--|
| Client ID: | TYLMO-20180117 | | | | | |
| Laboratory ID: | 01-190-14 | | | | | |
| Turbidity | 14 | 0.10 | EPA 180.1 | 1-18-18 | 1-18-18 | |



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TURBIDITY
EPA 180.1

Matrix: Water
Units: NTU

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|-------------------|-----------------------|------------|---------------|----------------------|----------------------|--------------|
| Client ID: | QA-41-20180117 | | | | | |
| Laboratory ID: | 01-190-15 | | | | | |
| Turbidity | 4.2 | 0.10 | EPA 180.1 | 1-18-18 | 1-18-18 | |



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**TURBIDITY
 EPA 180.1
 QUALITY CONTROL**

Matrix: Water
 Units: NTU

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|---------------------|-----------|------|-----------|---------------|---------------|-------|
| METHOD BLANK | | | | | | |
| Laboratory ID: | MB0118W1 | | | | | |
| Turbidity | ND | 0.10 | EPA 180.1 | 1-18-18 | 1-18-18 | |

| Analyte | Result | Spike Level | Source Result | Percent Recovery | Recovery Limits | RPD | RPD Limit | Flags |
|------------------|-------------|-------------|---------------|------------------|-----------------|-----|-----------|-------|
| DUPLICATE | | | | | | | | |
| Laboratory ID: | 01-185-01 | | | | | | | |
| | ORIG | DUP | | | | | | |
| Turbidity | 8.08 | 8.09 | NA | NA | NA | NA | 0 | 15 |



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HARDNESS
EPA 200.7/SM 2340B

Matrix: Water
 Units: mg eqt. CaCO₃/L (ppm)

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|-------------------|----------------------|-----|----------------|---------------|---------------|-------|
| Client ID: | COLM-20180117 | | | | | |
| Laboratory ID: | 01-190-01 | | | | | |
| Hardness | 8.1 | 1.0 | 200.7/SM 2340B | 1-26-18 | 1-29-18 | |

| | | | | | | |
|-------------------|-----------------------|-----|----------------|---------|---------|--|
| Client ID: | COUMI-20180117 | | | | | |
| Laboratory ID: | 01-190-02 | | | | | |
| Hardness | 52 | 1.0 | 200.7/SM 2340B | 1-26-18 | 1-29-18 | |

| | | | | | | |
|-------------------|-----------------------|-----|----------------|---------|---------|--|
| Client ID: | COUMO-20180117 | | | | | |
| Laboratory ID: | 01-190-03 | | | | | |
| Hardness | 52 | 1.0 | 200.7/SM 2340B | 1-26-18 | 1-29-18 | |

| | | | | | | |
|-------------------|-----------------------|-----|----------------|---------|---------|--|
| Client ID: | EVAMS-20180117 | | | | | |
| Laboratory ID: | 01-190-04 | | | | | |
| Hardness | 69 | 1.0 | 200.7/SM 2340B | 1-26-18 | 1-29-18 | |

| | | | | | | |
|-------------------|------------------------|-----|----------------|---------|---------|--|
| Client ID: | EVALSS-20180117 | | | | | |
| Laboratory ID: | 01-190-05 | | | | | |
| Hardness | 67 | 1.0 | 200.7/SM 2340B | 1-26-18 | 1-29-18 | |

| | | | | | | |
|-------------------|-----------------------|-----|----------------|---------|---------|--|
| Client ID: | MONMN-20180117 | | | | | |
| Laboratory ID: | 01-190-06 | | | | | |
| Hardness | 46 | 1.0 | 200.7/SM 2340B | 1-26-18 | 1-29-18 | |

| | | | | | | |
|-------------------|-----------------------|-----|----------------|---------|---------|--|
| Client ID: | MONMS-20180117 | | | | | |
| Laboratory ID: | 01-190-07 | | | | | |
| Hardness | 68 | 1.0 | 200.7/SM 2340B | 1-26-18 | 1-29-18 | |



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HARDNESS
EPA 200.7/SM 2340B

Matrix: Water
 Units: mg eqt. CaCO₃/L (ppm)

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|-------------------|----------------------|-----|----------------|---------------|---------------|-------|
| Client ID: | MONM-20180117 | | | | | |
| Laboratory ID: | 01-190-08 | | | | | |
| Hardness | 52 | 1.0 | 200.7/SM 2340B | 1-26-18 | 1-29-18 | |

| | | | | | | |
|-------------------|-----------------------|-----|----------------|---------|---------|--|
| Client ID: | SEIMN-20180117 | | | | | |
| Laboratory ID: | 01-190-09 | | | | | |
| Hardness | 21 | 1.0 | 200.7/SM 2340B | 1-26-18 | 1-29-18 | |

| | | | | | | |
|-------------------|-----------------------|-----|----------------|---------|---------|--|
| Client ID: | SEIMS-20180117 | | | | | |
| Laboratory ID: | 01-190-10 | | | | | |
| Hardness | 32 | 1.0 | 200.7/SM 2340B | 1-26-18 | 1-29-18 | |

| | | | | | | |
|-------------------|-----------------------|-----|----------------|---------|---------|--|
| Client ID: | TOSMI-20180117 | | | | | |
| Laboratory ID: | 01-190-11 | | | | | |
| Hardness | 74 | 1.0 | 200.7/SM 2340B | 1-26-18 | 1-29-18 | |

| | | | | | | |
|-------------------|-----------------------|-----|----------------|---------|---------|--|
| Client ID: | TOSMO-20180117 | | | | | |
| Laboratory ID: | 01-190-12 | | | | | |
| Hardness | 98 | 1.0 | 200.7/SM 2340B | 1-26-18 | 1-29-18 | |

| | | | | | | |
|-------------------|-----------------------|-----|----------------|---------|---------|--|
| Client ID: | TYLMI-20180117 | | | | | |
| Laboratory ID: | 01-190-13 | | | | | |
| Hardness | 59 | 1.0 | 200.7/SM 2340B | 1-26-18 | 1-29-18 | |

| | | | | | | |
|-------------------|-----------------------|-----|----------------|---------|---------|--|
| Client ID: | TYLMO-20180117 | | | | | |
| Laboratory ID: | 01-190-14 | | | | | |
| Hardness | 21 | 1.0 | 200.7/SM 2340B | 1-26-18 | 1-29-18 | |



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HARDNESS
EPA 200.7/SM 2340B

Matrix: Water
Units: mg eqt. CaCO₃/L (ppm)

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|-------------------|-----------------------|------------|----------------|----------------------|----------------------|--------------|
| Client ID: | QA-41-20180117 | | | | | |
| Laboratory ID: | 01-190-15 | | | | | |
| Hardness | 66 | 1.0 | 200.7/SM 2340B | 1-26-18 | 1-29-18 | |



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**HARDNESS
 EPA 200.7/SM 2340B
 QUALITY CONTROL**

Matrix: Water
 Units: mg eqt. CaCO₃/L (ppm)

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|---------------------|-----------|-----|----------------|---------------|---------------|-------|
| METHOD BLANK | | | | | | |
| Laboratory ID: | MB0126WH2 | | | | | |
| Hardness | ND | 1.0 | 200.7/SM 2340B | 1-26-18 | 1-29-18 | |

| Analyte | Result | Spike Level | Source Result | Percent Recovery | Recovery Limits | RPD | RPD Limit | Flags |
|------------------|-------------|-------------|---------------|------------------|-----------------|-----|-----------|-------|
| DUPLICATE | | | | | | | | |
| Laboratory ID: | 01-190-01 | | | | | | | |
| | ORIG | DUP | | | | | | |
| Hardness | 8.12 | 7.70 | NA | NA | NA | 5 | 20 | |

| Analyte | Result | Spike Level | Source Result | Percent Recovery | Recovery Limits | RPD | RPD Limit | Flags | | |
|----------------------|------------|-------------|---------------|------------------|-----------------|-----|-----------|--------|---|----|
| MATRIX SPIKES | | | | | | | | | | |
| Laboratory ID: | 01-190-01 | | | | | | | | | |
| | MS | MSD | MS | MSD | MS | MSD | | | | |
| Hardness | 142 | 143 | 132 | 132 | 8.12 | 101 | 102 | 75-125 | 1 | 20 |

| Analyte | Result | Spike Level | Source Result | Percent Recovery | Recovery Limits | RPD | RPD Limit | Flags |
|--------------------|------------|-------------|---------------|------------------|-----------------|-----|-----------|-------|
| SPIKE BLANK | | | | | | | | |
| Laboratory ID: | SB0126WH2 | | | | | | | |
| | SB | SB | | | SB | | | |
| Hardness | 131 | 132 | NA | 99 | 80-120 | NA | NA | |



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**DISSOLVED ORGANIC CARBON
 SM 5310B**

Matrix: Water
 Units: mg/L

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|--------------------------|------------------------|-----|----------|---------------|---------------|-------|
| Client ID: | COLM-20180117 | | | | | |
| Laboratory ID: | 01-190-01 | | | | | |
| Dissolved Organic Carbon | 9.9 | 1.0 | SM 5310B | 1-25-18 | 1-25-18 | |
| Client ID: | COUMI-20180117 | | | | | |
| Laboratory ID: | 01-190-02 | | | | | |
| Dissolved Organic Carbon | 3.4 | 1.0 | SM 5310B | 1-25-18 | 1-25-18 | |
| Client ID: | COUMO-20180117 | | | | | |
| Laboratory ID: | 01-190-03 | | | | | |
| Dissolved Organic Carbon | 4.1 | 1.0 | SM 5310B | 1-25-18 | 1-25-18 | |
| Client ID: | EVAMS-20180117 | | | | | |
| Laboratory ID: | 01-190-04 | | | | | |
| Dissolved Organic Carbon | 4.6 | 1.0 | SM 5310B | 1-25-18 | 1-25-18 | |
| Client ID: | EVALSS-20180117 | | | | | |
| Laboratory ID: | 01-190-05 | | | | | |
| Dissolved Organic Carbon | 4.6 | 1.0 | SM 5310B | 1-25-18 | 1-25-18 | |
| Client ID: | MONMN-20180117 | | | | | |
| Laboratory ID: | 01-190-06 | | | | | |
| Dissolved Organic Carbon | 7.0 | 1.0 | SM 5310B | 1-25-18 | 1-25-18 | |
| Client ID: | MONMS-20180117 | | | | | |
| Laboratory ID: | 01-190-07 | | | | | |
| Dissolved Organic Carbon | 5.5 | 1.0 | SM 5310B | 1-25-18 | 1-25-18 | |



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**DISSOLVED ORGANIC CARBON
 SM 5310B**

Matrix: Water
 Units: mg/L

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|--------------------------|-----------------------|-----|----------|---------------|---------------|-------|
| Client ID: | MONM-20180117 | | | | | |
| Laboratory ID: | 01-190-08 | | | | | |
| Dissolved Organic Carbon | 6.5 | 1.0 | SM 5310B | 1-25-18 | 1-25-18 | |
| Client ID: | SEIMN-20180117 | | | | | |
| Laboratory ID: | 01-190-09 | | | | | |
| Dissolved Organic Carbon | 7.1 | 1.0 | SM 5310B | 1-25-18 | 1-25-18 | |
| Client ID: | SEIMS-20180117 | | | | | |
| Laboratory ID: | 01-190-10 | | | | | |
| Dissolved Organic Carbon | 8.8 | 1.0 | SM 5310B | 1-25-18 | 1-25-18 | |
| Client ID: | TOSMI-20180117 | | | | | |
| Laboratory ID: | 01-190-11 | | | | | |
| Dissolved Organic Carbon | 5.5 | 1.0 | SM 5310B | 1-25-18 | 1-25-18 | |
| Client ID: | TOSMO-20180117 | | | | | |
| Laboratory ID: | 01-190-12 | | | | | |
| Dissolved Organic Carbon | 4.9 | 1.0 | SM 5310B | 1-25-18 | 1-25-18 | |
| Client ID: | TYLMI-20180117 | | | | | |
| Laboratory ID: | 01-190-13 | | | | | |
| Dissolved Organic Carbon | 6.1 | 1.0 | SM 5310B | 1-25-18 | 1-25-18 | |
| Client ID: | TYLMO-20180117 | | | | | |
| Laboratory ID: | 01-190-14 | | | | | |
| Dissolved Organic Carbon | 3.1 | 1.0 | SM 5310B | 1-25-18 | 1-25-18 | |



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**DISSOLVED ORGANIC CARBON
SM 5310B**

Matrix: Water
Units: mg/L

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|--------------------------|-----------------------|------------|---------------|----------------------|----------------------|--------------|
| Client ID: | QA-41-20180117 | | | | | |
| Laboratory ID: | 01-190-15 | | | | | |
| Dissolved Organic Carbon | 4.3 | 1.0 | SM 5310B | 1-25-18 | 1-25-18 | |



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**DISSOLVED ORGANIC CARBON
 SM 5310B
 QUALITY CONTROL**

Matrix: Water
 Units: mg/L

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|--------------------------|-----------|-----|----------|---------------|---------------|-------|
| METHOD BLANK | | | | | | |
| Laboratory ID: | MB0125D1 | | | | | |
| Dissolved Organic Carbon | ND | 1.0 | SM 5310B | 1-25-18 | 1-25-18 | |

| Analyte | Result | Spike Level | Source Result | Percent Recovery | Recovery Limits | RPD | RPD Limit | Flags |
|--------------------------|-------------|-------------|---------------|------------------|-----------------|-----|-----------|-------|
| DUPLICATE | | | | | | | | |
| Laboratory ID: | 01-190-01 | | | | | | | |
| | ORIG | DUP | | | | | | |
| Dissolved Organic Carbon | 9.88 | 9.92 | NA | NA | NA | 0 | 15 | |

MATRIX SPIKE

| | | | | | | | | |
|--------------------------|-------------|------|------|----|--------|----|----|--|
| Laboratory ID: | 01-190-01 | | | | | | | |
| | MS | MS | | MS | | | | |
| Dissolved Organic Carbon | 19.0 | 10.0 | 9.88 | 91 | 75-125 | NA | NA | |

SPIKE BLANK

| | | | | | | | | |
|--------------------------|-------------|------|----|----|--------|----|----|--|
| Laboratory ID: | SB0125D1 | | | | | | | |
| | SB | SB | | SB | | | | |
| Dissolved Organic Carbon | 9.83 | 10.0 | NA | 98 | 80-120 | NA | NA | |



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 Samples Submitted: January 17, 2018
 Laboratory Reference: 1801-190
 Project: 14-05806-000

TOTAL PHOSPHORUS
EPA 365.1

Matrix: Water
 Units: mg/L

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|-------------------|----------------------|-------|-----------|---------------|---------------|-------|
| Client ID: | COLM-20180117 | | | | | |
| Laboratory ID: | 01-190-01 | | | | | |
| Total Phosphorus | ND | 0.010 | EPA 365.1 | 1-26-18 | 1-26-18 | |

| | | | | | | |
|-------------------|-----------------------|-------|-----------|---------|---------|--|
| Client ID: | COUMI-20180117 | | | | | |
| Laboratory ID: | 01-190-02 | | | | | |
| Total Phosphorus | 0.11 | 0.010 | EPA 365.1 | 1-26-18 | 1-26-18 | |

| | | | | | | |
|-------------------|-----------------------|-------|-----------|---------|---------|--|
| Client ID: | COUMO-20180117 | | | | | |
| Laboratory ID: | 01-190-03 | | | | | |
| Total Phosphorus | 0.096 | 0.010 | EPA 365.1 | 1-26-18 | 1-26-18 | |

| | | | | | | |
|-------------------|-----------------------|-------|-----------|---------|---------|--|
| Client ID: | EVAMS-20180117 | | | | | |
| Laboratory ID: | 01-190-04 | | | | | |
| Total Phosphorus | 0.024 | 0.010 | EPA 365.1 | 1-26-18 | 1-26-18 | |

| | | | | | | |
|-------------------|------------------------|-------|-----------|---------|---------|--|
| Client ID: | EVALSS-20180117 | | | | | |
| Laboratory ID: | 01-190-05 | | | | | |
| Total Phosphorus | 0.018 | 0.010 | EPA 365.1 | 1-26-18 | 1-26-18 | |

| | | | | | | |
|-------------------|-----------------------|-------|-----------|---------|---------|--|
| Client ID: | MONMN-20180117 | | | | | |
| Laboratory ID: | 01-190-06 | | | | | |
| Total Phosphorus | 0.051 | 0.010 | EPA 365.1 | 1-26-18 | 1-26-18 | |

| | | | | | | |
|-------------------|-----------------------|-------|-----------|---------|---------|--|
| Client ID: | MONMS-20180117 | | | | | |
| Laboratory ID: | 01-190-07 | | | | | |
| Total Phosphorus | 0.029 | 0.010 | EPA 365.1 | 1-26-18 | 1-26-18 | |



Date of Report: February 9, 2018
 Samples Submitted: January 17, 2018
 Laboratory Reference: 1801-190
 Project: 14-05806-000

TOTAL PHOSPHORUS
EPA 365.1

Matrix: Water
 Units: mg/L

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|-------------------|----------------------|-------|-----------|---------------|---------------|-------|
| Client ID: | MONM-20180117 | | | | | |
| Laboratory ID: | 01-190-08 | | | | | |
| Total Phosphorus | 0.045 | 0.010 | EPA 365.1 | 1-26-18 | 1-26-18 | |

| | | | | | | |
|-------------------|-----------------------|-------|-----------|---------|---------|--|
| Client ID: | SEIMN-20180117 | | | | | |
| Laboratory ID: | 01-190-09 | | | | | |
| Total Phosphorus | 0.040 | 0.010 | EPA 365.1 | 1-26-18 | 1-26-18 | |

| | | | | | | |
|-------------------|-----------------------|-------|-----------|---------|---------|--|
| Client ID: | SEIMS-20180117 | | | | | |
| Laboratory ID: | 01-190-10 | | | | | |
| Total Phosphorus | 0.075 | 0.010 | EPA 365.1 | 1-26-18 | 1-26-18 | |

| | | | | | | |
|-------------------|-----------------------|-------|-----------|---------|---------|--|
| Client ID: | TOSMI-20180117 | | | | | |
| Laboratory ID: | 01-190-11 | | | | | |
| Total Phosphorus | 0.092 | 0.010 | EPA 365.1 | 1-26-18 | 1-26-18 | |

| | | | | | | |
|-------------------|-----------------------|-------|-----------|---------|---------|--|
| Client ID: | TOSMO-20180117 | | | | | |
| Laboratory ID: | 01-190-12 | | | | | |
| Total Phosphorus | 0.34 | 0.010 | EPA 365.1 | 1-26-18 | 1-26-18 | |

| | | | | | | |
|-------------------|-----------------------|-------|-----------|---------|---------|--|
| Client ID: | TYLMI-20180117 | | | | | |
| Laboratory ID: | 01-190-13 | | | | | |
| Total Phosphorus | 0.066 | 0.010 | EPA 365.1 | 1-26-18 | 1-26-18 | |

| | | | | | | |
|-------------------|-----------------------|-------|-----------|---------|---------|--|
| Client ID: | TYLMO-20180117 | | | | | |
| Laboratory ID: | 01-190-14 | | | | | |
| Total Phosphorus | 0.14 | 0.010 | EPA 365.1 | 1-26-18 | 1-26-18 | |



Date of Report: February 9, 2018
Samples Submitted: January 17, 2018
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Project: 14-05806-000

TOTAL PHOSPHORUS
EPA 365.1

Matrix: Water
Units: mg/L

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|-------------------|-----------------------|------------|---------------|----------------------|----------------------|--------------|
| Client ID: | QA-41-20180117 | | | | | |
| Laboratory ID: | 01-190-15 | | | | | |
| Total Phosphorus | 0.018 | 0.010 | EPA 365.1 | 1-26-18 | 1-26-18 | |



Date of Report: February 9, 2018
 Samples Submitted: January 17, 2018
 Laboratory Reference: 1801-190
 Project: 14-05806-000

**TOTAL PHOSPHORUS
 EPA 365.1
 QUALITY CONTROL**

Matrix: Water
 Units: mg/L

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|---------------------|-----------|-------|-----------|---------------|---------------|-------|
| METHOD BLANK | | | | | | |
| Laboratory ID: | MB0126W1 | | | | | |
| Total Phosphorus | ND | 0.010 | EPA 365.1 | 1-26-18 | 1-26-18 | |

| Analyte | Result | Spike Level | Source Result | Percent Recovery | Recovery Limits | RPD | RPD Limit | Flags |
|------------------|-----------|-------------|---------------|------------------|-----------------|-----|-----------|-------|
| DUPLICATE | | | | | | | | |
| Laboratory ID: | 01-190-01 | | | | | | | |
| | ORIG | DUP | | | | | | |
| Total Phosphorus | ND | ND | NA | NA | NA | NA | 11 | |

| | | | | | | | | |
|---------------------|--------------|-------|----|----|--------|----|----|--|
| MATRIX SPIKE | | | | | | | | |
| Laboratory ID: | 01-190-01 | | | | | | | |
| | MS | MS | | MS | | | | |
| Total Phosphorus | 0.240 | 0.250 | ND | 96 | 82-124 | NA | NA | |

| | | | | | | | | |
|--------------------|--------------|-------|----|-----|--------|----|----|--|
| SPIKE BLANK | | | | | | | | |
| Laboratory ID: | SB0126W1 | | | | | | | |
| | SB | SB | | SB | | | | |
| Total Phosphorus | 0.253 | 0.250 | NA | 101 | 87-114 | NA | NA | |



Date of Report: February 9, 2018
 Samples Submitted: January 17, 2018
 Laboratory Reference: 1801-190
 Project: 14-05806-000

TOTAL METALS
EPA 200.8

Matrix: Water
 Units: ug/L (ppb)

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|-------------------|----------------------|-----|-----------|---------------|---------------|-------|
| Client ID: | COLM-20180117 | | | | | |
| Laboratory ID: | 01-190-01 | | | | | |
| Copper | ND | 1.0 | EPA 200.8 | 1-31-18 | 1-31-18 | |
| Zinc | ND | 5.0 | EPA 200.8 | 1-31-18 | 1-31-18 | |

| | | | | | | |
|-------------------|-----------------------|-----|-----------|---------|---------|--|
| Client ID: | COUMI-20180117 | | | | | |
| Laboratory ID: | 01-190-02 | | | | | |
| Copper | 8.0 | 1.0 | EPA 200.8 | 1-28-18 | 1-30-18 | |
| Zinc | 40 | 5.0 | EPA 200.8 | 1-28-18 | 1-30-18 | |

| | | | | | | |
|-------------------|-----------------------|-----|-----------|---------|---------|--|
| Client ID: | COUMO-20180117 | | | | | |
| Laboratory ID: | 01-190-03 | | | | | |
| Copper | 9.3 | 1.0 | EPA 200.8 | 1-28-18 | 1-30-18 | |
| Zinc | 55 | 5.0 | EPA 200.8 | 1-28-18 | 1-30-18 | |

| | | | | | | |
|-------------------|-----------------------|-----|-----------|---------|---------|--|
| Client ID: | EVAMS-20180117 | | | | | |
| Laboratory ID: | 01-190-04 | | | | | |
| Copper | ND | 1.0 | EPA 200.8 | 1-28-18 | 1-30-18 | |
| Zinc | ND | 5.0 | EPA 200.8 | 1-28-18 | 1-30-18 | |



Date of Report: February 9, 2018
 Samples Submitted: January 17, 2018
 Laboratory Reference: 1801-190
 Project: 14-05806-000

TOTAL METALS
EPA 200.8

Matrix: Water
 Units: ug/L (ppb)

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|-------------------|------------------------|-----|-----------|---------------|---------------|-------|
| Client ID: | EVALSS-20180117 | | | | | |
| Laboratory ID: | 01-190-05 | | | | | |
| Copper | ND | 1.0 | EPA 200.8 | 1-28-18 | 1-30-18 | |
| Zinc | ND | 5.0 | EPA 200.8 | 1-28-18 | 1-30-18 | |

| | | | | | | |
|-------------------|-----------------------|-----|-----------|---------|---------|--|
| Client ID: | MONMN-20180117 | | | | | |
| Laboratory ID: | 01-190-06 | | | | | |
| Copper | 2.2 | 1.0 | EPA 200.8 | 1-28-18 | 1-30-18 | |
| Zinc | 8.7 | 5.0 | EPA 200.8 | 1-28-18 | 1-30-18 | |

| | | | | | | |
|-------------------|-----------------------|-----|-----------|---------|---------|--|
| Client ID: | MONMS-20180117 | | | | | |
| Laboratory ID: | 01-190-07 | | | | | |
| Copper | 2.1 | 1.0 | EPA 200.8 | 1-28-18 | 1-30-18 | |
| Zinc | ND | 5.0 | EPA 200.8 | 1-28-18 | 1-30-18 | |

| | | | | | | |
|-------------------|----------------------|-----|-----------|---------|---------|--|
| Client ID: | MONM-20180117 | | | | | |
| Laboratory ID: | 01-190-08 | | | | | |
| Copper | 2.7 | 1.0 | EPA 200.8 | 1-28-18 | 1-30-18 | |
| Zinc | 20 | 5.0 | EPA 200.8 | 1-28-18 | 1-30-18 | |



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 Samples Submitted: January 17, 2018
 Laboratory Reference: 1801-190
 Project: 14-05806-000

TOTAL METALS
EPA 200.8

Matrix: Water
 Units: ug/L (ppb)

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|-------------------|-----------------------|-----|-----------|---------------|---------------|-------|
| Client ID: | SEIMN-20180117 | | | | | |
| Laboratory ID: | 01-190-09 | | | | | |
| Copper | 2.1 | 1.0 | EPA 200.8 | 1-28-18 | 1-30-18 | |
| Zinc | ND | 5.0 | EPA 200.8 | 1-28-18 | 1-30-18 | |

| | | | | | | |
|-------------------|-----------------------|-----|-----------|---------|---------|--|
| Client ID: | SEIMS-20180117 | | | | | |
| Laboratory ID: | 01-190-10 | | | | | |
| Copper | 1.0 | 1.0 | EPA 200.8 | 1-28-18 | 1-30-18 | |
| Zinc | ND | 5.0 | EPA 200.8 | 1-28-18 | 1-30-18 | |

| | | | | | | |
|-------------------|-----------------------|-----|-----------|---------|---------|--|
| Client ID: | TOSMI-20180117 | | | | | |
| Laboratory ID: | 01-190-11 | | | | | |
| Copper | 14 | 1.0 | EPA 200.8 | 1-28-18 | 1-30-18 | |
| Zinc | 86 | 5.0 | EPA 200.8 | 1-28-18 | 1-30-18 | |

| | | | | | | |
|-------------------|-----------------------|-----|-----------|---------|---------|--|
| Client ID: | TOSMO-20180117 | | | | | |
| Laboratory ID: | 01-190-12 | | | | | |
| Copper | 14 | 1.0 | EPA 200.8 | 1-28-18 | 1-30-18 | |
| Zinc | 160 | 5.0 | EPA 200.8 | 1-28-18 | 1-30-18 | |



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 Samples Submitted: January 17, 2018
 Laboratory Reference: 1801-190
 Project: 14-05806-000

TOTAL METALS
EPA 200.8

Matrix: Water
 Units: ug/L (ppb)

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|-------------------|-----------------------|-----|-----------|---------------|---------------|-------|
| Client ID: | TYLMI-20180117 | | | | | |
| Laboratory ID: | 01-190-13 | | | | | |
| Copper | 4.6 | 2.5 | EPA 200.8 | 1-28-18 | 1-30-18 | |
| Zinc | 300 | 13 | EPA 200.8 | 1-28-18 | 1-30-18 | |

| | | | | | | |
|-------------------|-----------------------|-----|-----------|---------|---------|--|
| Client ID: | TYLMO-20180117 | | | | | |
| Laboratory ID: | 01-190-14 | | | | | |
| Copper | 6.1 | 1.0 | EPA 200.8 | 1-28-18 | 1-30-18 | |
| Zinc | 28 | 5.0 | EPA 200.8 | 1-28-18 | 1-30-18 | |

| | | | | | | |
|-------------------|-----------------------|-----|-----------|---------|---------|--|
| Client ID: | QA-41-20180117 | | | | | |
| Laboratory ID: | 01-190-15 | | | | | |
| Copper | ND | 1.0 | EPA 200.8 | 1-28-18 | 1-30-18 | |
| Zinc | ND | 5.0 | EPA 200.8 | 1-28-18 | 1-30-18 | |



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 Samples Submitted: January 17, 2018
 Laboratory Reference: 1801-190
 Project: 14-05806-000

**TOTAL METALS
 EPA 200.8
 QUALITY CONTROL**

Matrix: Water
 Units: ug/L (ppb)

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|---------------------|-----------|-----|-----------|---------------|---------------|-------|
| METHOD BLANK | | | | | | |
| Laboratory ID: | MB0128WH2 | | | | | |
| Copper | ND | 1.0 | EPA 200.8 | 1-28-18 | 1-30-18 | |
| Zinc | ND | 5.0 | EPA 200.8 | 1-28-18 | 1-30-18 | |
| METHOD BLANK | | | | | | |
| Laboratory ID: | MB0131WH1 | | | | | |
| Copper | ND | 1.0 | EPA 200.8 | 1-31-18 | 1-31-18 | |
| Zinc | ND | 5.0 | EPA 200.8 | 1-31-18 | 1-31-18 | |

| Analyte | Result | Spike Level | Source Result | Percent Recovery | Recovery Limits | RPD | RPD Limit | Flags |
|------------------|-----------|-------------|---------------|------------------|-----------------|-----|-----------|-------|
| DUPLICATE | | | | | | | | |
| Laboratory ID: | 01-190-05 | | | | | | | |
| | ORIG | DUP | | | | | | |
| Copper | ND | ND | NA | NA | NA | NA | 20 | |
| Zinc | ND | ND | NA | NA | NA | NA | 20 | |
| DUPLICATE | | | | | | | | |
| Laboratory ID: | 01-103-04 | | | | | | | |
| | ORIG | DUP | | | | | | |
| Copper | 1.02 | 1.23 | NA | NA | NA | 19 | 20 | |
| Zinc | ND | ND | NA | NA | NA | NA | 20 | |

MATRIX SPIKES

| | | | | | | | | | | |
|----------------------|-----------|------|-----|-----|------|-----|-----|--------|---|----|
| Laboratory ID: | 01-190-05 | | | | | | | | | |
| | MS | MSD | MS | MSD | | MS | MSD | | | |
| Copper | 98.0 | 97.6 | 100 | 100 | ND | 98 | 98 | 75-125 | 0 | 20 |
| Zinc | 106 | 103 | 100 | 100 | ND | 106 | 103 | 75-125 | 3 | 20 |
| MATRIX SPIKES | | | | | | | | | | |
| Laboratory ID: | 01-103-04 | | | | | | | | | |
| | MS | MSD | MS | MSD | | MS | MSD | | | |
| Copper | 104 | 104 | 100 | 100 | 1.02 | 103 | 103 | 75-125 | 0 | 20 |
| Zinc | 118 | 118 | 100 | 100 | ND | 118 | 118 | 75-125 | 1 | 20 |



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 Samples Submitted: January 17, 2018
 Laboratory Reference: 1801-190
 Project: 14-05806-000

**DISSOLVED METALS
 EPA 200.8**

Matrix: Water
 Units: ug/L (ppb)

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|-------------------|----------------------|-----|-----------|---------------|---------------|-------|
| Client ID: | COLM-20180117 | | | | | |
| Laboratory ID: | 01-190-01 | | | | | |
| Copper | 11 | 1.0 | EPA 200.8 | | 1-30-18 | |
| Zinc | 9.1 | 5.0 | EPA 200.8 | | 1-30-18 | |

| | | | | | | |
|-------------------|-----------------------|-----|-----------|--|---------|--|
| Client ID: | COUMI-20180117 | | | | | |
| Laboratory ID: | 01-190-02 | | | | | |
| Copper | 1.3 | 1.0 | EPA 200.8 | | 1-30-18 | |
| Zinc | ND | 5.0 | EPA 200.8 | | 1-30-18 | |

| | | | | | | |
|-------------------|-----------------------|-----|-----------|--|---------|--|
| Client ID: | COUMO-20180117 | | | | | |
| Laboratory ID: | 01-190-03 | | | | | |
| Copper | 2.1 | 1.0 | EPA 200.8 | | 1-30-18 | |
| Zinc | 11 | 5.0 | EPA 200.8 | | 1-30-18 | |

| | | | | | | |
|-------------------|-----------------------|-----|-----------|--|---------|--|
| Client ID: | EVAMS-20180117 | | | | | |
| Laboratory ID: | 01-190-04 | | | | | |
| Copper | ND | 1.0 | EPA 200.8 | | 1-30-18 | |
| Zinc | ND | 5.0 | EPA 200.8 | | 1-30-18 | |

| | | | | | | |
|-------------------|------------------------|-----|-----------|--|---------|--|
| Client ID: | EVALSS-20180117 | | | | | |
| Laboratory ID: | 01-190-05 | | | | | |
| Copper | ND | 1.0 | EPA 200.8 | | 1-30-18 | |
| Zinc | ND | 5.0 | EPA 200.8 | | 1-30-18 | |

| | | | | | | |
|-------------------|-----------------------|-----|-----------|--|---------|--|
| Client ID: | MONMN-20180117 | | | | | |
| Laboratory ID: | 01-190-06 | | | | | |
| Copper | 2.1 | 1.0 | EPA 200.8 | | 1-30-18 | |
| Zinc | 5.4 | 5.0 | EPA 200.8 | | 1-30-18 | |

| | | | | | | |
|-------------------|-----------------------|-----|-----------|--|---------|--|
| Client ID: | MONMS-20180117 | | | | | |
| Laboratory ID: | 01-190-07 | | | | | |
| Copper | 1.5 | 1.0 | EPA 200.8 | | 1-30-18 | |
| Zinc | ND | 5.0 | EPA 200.8 | | 1-30-18 | |



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 Samples Submitted: January 17, 2018
 Laboratory Reference: 1801-190
 Project: 14-05806-000

**DISSOLVED METALS
 EPA 200.8**

Matrix: Water
 Units: ug/L (ppb)

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|-------------------|----------------------|-----|-----------|---------------|---------------|-------|
| Client ID: | MONM-20180117 | | | | | |
| Laboratory ID: | 01-190-08 | | | | | |
| Copper | 1.1 | 1.0 | EPA 200.8 | | 1-30-18 | |
| Zinc | 7.7 | 5.0 | EPA 200.8 | | 1-30-18 | |

| | | | | | | |
|-------------------|-----------------------|-----|-----------|--|---------|--|
| Client ID: | SEIMN-20180117 | | | | | |
| Laboratory ID: | 01-190-09 | | | | | |
| Copper | 1.2 | 1.0 | EPA 200.8 | | 1-30-18 | |
| Zinc | ND | 5.0 | EPA 200.8 | | 1-30-18 | |

| | | | | | | |
|-------------------|-----------------------|-----|-----------|--|---------|--|
| Client ID: | SEIMS-20180117 | | | | | |
| Laboratory ID: | 01-190-10 | | | | | |
| Copper | ND | 1.0 | EPA 200.8 | | 1-30-18 | |
| Zinc | ND | 5.0 | EPA 200.8 | | 1-30-18 | |

| | | | | | | |
|-------------------|-----------------------|-----|-----------|--|---------|--|
| Client ID: | TOSMI-20180117 | | | | | |
| Laboratory ID: | 01-190-11 | | | | | |
| Copper | 3.2 | 1.0 | EPA 200.8 | | 1-30-18 | |
| Zinc | 21 | 5.0 | EPA 200.8 | | 1-30-18 | |

| | | | | | | |
|-------------------|-----------------------|-----|-----------|--|---------|--|
| Client ID: | TOSMO-20180117 | | | | | |
| Laboratory ID: | 01-190-12 | | | | | |
| Copper | 2.3 | 1.0 | EPA 200.8 | | 1-30-18 | |
| Zinc | 17 | 5.0 | EPA 200.8 | | 1-30-18 | |

| | | | | | | |
|-------------------|-----------------------|-----|-----------|--|---------|--|
| Client ID: | TYLMI-20180117 | | | | | |
| Laboratory ID: | 01-190-13 | | | | | |
| Copper | 2.5 | 1.0 | EPA 200.8 | | 1-30-18 | |
| Zinc | 240 | 13 | EPA 200.8 | | 1-30-18 | |

| | | | | | | |
|-------------------|-----------------------|-----|-----------|--|---------|--|
| Client ID: | TYLMO-20180117 | | | | | |
| Laboratory ID: | 01-190-14 | | | | | |
| Copper | 1.9 | 1.0 | EPA 200.8 | | 1-30-18 | |
| Zinc | ND | 5.0 | EPA 200.8 | | 1-30-18 | |



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Samples Submitted: January 17, 2018
Laboratory Reference: 1801-190
Project: 14-05806-000

DISSOLVED METALS
EPA 200.8

Matrix: Water
Units: ug/L (ppb)

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|-------------------|-----------------------|------------|---------------|----------------------|----------------------|--------------|
| Client ID: | QA-41-20180117 | | | | | |
| Laboratory ID: | 01-190-15 | | | | | |
| Copper | ND | 1.0 | EPA 200.8 | | 1-30-18 | |
| Zinc | ND | 5.0 | EPA 200.8 | | 1-30-18 | |



Date of Report: February 9, 2018
 Samples Submitted: January 17, 2018
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 Project: 14-05806-000

**DISSOLVED METALS
 EPA 200.8
 QUALITY CONTROL**

Matrix: Water
 Units: ug/L (ppb)

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|---------------------|----------|-----|-----------|---------------|---------------|-------|
| METHOD BLANK | | | | | | |
| Laboratory ID: | MB0130D1 | | | | | |
| Copper | ND | 1.0 | EPA 200.8 | | 1-30-18 | |
| Zinc | ND | 5.0 | EPA 200.8 | | 1-30-18 | |

| Analyte | Result | | Spike Level | | Source Result | Percent Recovery | Recovery Limits | RPD | RPD Limit | Flags |
|------------------|-----------|-----|-------------|----|---------------|------------------|-----------------|-----|-----------|-------|
| DUPLICATE | | | | | | | | | | |
| Laboratory ID: | 01-190-15 | | | | | | | | | |
| | ORIG | DUP | | | | | | | | |
| Copper | ND | ND | NA | NA | | NA | NA | NA | 20 | |
| Zinc | ND | ND | NA | NA | | NA | NA | NA | 20 | |

MATRIX SPIKES

| | | | | | | | | | | |
|----------------|-----------|------|------|------|----|----|-----|--------|---|----|
| Laboratory ID: | 01-190-15 | | | | | | | | | |
| | MS | MSD | MS | MSD | | MS | MSD | | | |
| Copper | 69.6 | 70.0 | 80.0 | 80.0 | ND | 87 | 88 | 75-125 | 1 | 20 |
| Zinc | 79.0 | 80.8 | 80.0 | 80.0 | ND | 99 | 101 | 75-125 | 2 | 20 |





Data Qualifiers and Abbreviations

- A - Due to a high sample concentration, the amount spiked is insufficient for meaningful MS/MSD recovery data.
 - B - The analyte indicated was also found in the blank sample.
 - C - The duplicate RPD is outside control limits due to high result variability when analyte concentrations are within five times the quantitation limit.
 - E - The value reported exceeds the quantitation range and is an estimate.
 - F - Surrogate recovery data is not available due to the high concentration of coeluting target compounds.
 - H - The analyte indicated is a common laboratory solvent and may have been introduced during sample preparation, and be impacting the sample result.
 - I - Compound recovery is outside of the control limits.
 - J - The value reported was below the practical quantitation limit. The value is an estimate.
 - K - Sample duplicate RPD is outside control limits due to sample inhomogeneity. The sample was re-extracted and re-analyzed with similar results.
 - L - The RPD is outside of the control limits.
 - M - Hydrocarbons in the gasoline range are impacting the diesel range result.
 - M1 - Hydrocarbons in the gasoline range (toluene-naphthalene) are present in the sample.
 - N - Hydrocarbons in the lube oil range are impacting the diesel range result.
 - N1 - Hydrocarbons in diesel range are impacting lube oil range results.
 - O - Hydrocarbons indicative of heavier fuels are present in the sample and are impacting the gasoline result.
 - P - The RPD of the detected concentrations between the two columns is greater than 40.
 - Q - Surrogate recovery is outside of the control limits.
 - S - Surrogate recovery data is not available due to the necessary dilution of the sample.
 - T - The sample chromatogram is not similar to a typical _____.
 - U - The analyte was analyzed for, but was not detected above the reported sample quantitation limit.
 - U1 - The practical quantitation limit is elevated due to interferences present in the sample.
 - V - Matrix Spike/Matrix Spike Duplicate recoveries are outside control limits due to matrix effects.
 - W - Matrix Spike/Matrix Spike Duplicate RPD are outside control limits due to matrix effects.
 - X - Sample extract treated with a mercury cleanup procedure.
 - X1 - Sample extract treated with a sulfuric acid/silica gel cleanup procedure.
 - Y - The calibration verification for this analyte exceeded the 20% drift specified in method 8260C, and therefore the reported result should be considered an estimate. The overall performance of the calibration verification standard met the acceptance criteria of the method.
 - Z -
- ND - Not Detected at PQL
 PQL - Practical Quantitation Limit
 RPD - Relative Percent Difference





Am Test Inc.
13600 NE 126TH PL
Suite C
Kirkland, WA 98034
(425) 885-1664

**Professional
Analytical
Services**

Feb 9 2018
On-Site Environmental
14648 NE 95th ST
Redmond, WA 98052
Attention: David Baumeister

Dear David Baumeister:

Enclosed please find the analytical data for your REDMOND PAIRED WATERSHED STUDY project.

The following is a cross correlation of client and laboratory identifications for your convenience.

| CLIENT ID | MATRIX | AMTEST ID | TEST |
|-----------------|--------|------------|------------|
| COLM-20180117 | Water | 18-A000891 | Micro, NUT |
| COUMI-20180117 | Water | 18-A000892 | Micro, NUT |
| COUMO-20180117 | Water | 18-A000893 | Micro, NUT |
| EVAMS-20180117 | Water | 18-A000894 | Micro, NUT |
| EVALSS-20180117 | Water | 18-A000895 | Micro, NUT |
| MONMN-20180117 | Water | 18-A000896 | Micro, NUT |
| MONMS-20180117 | Water | 18-A000897 | Micro, NUT |
| MONM-20180117 | Water | 18-A000898 | Micro, NUT |
| SEIMN-20180117 | Water | 18-A000899 | Micro, NUT |
| SEIMS-20180117 | Water | 18-A000900 | Micro, NUT |
| TOSMI-20180117 | Water | 18-A000901 | Micro, NUT |
| TOSMO-20180117 | Water | 18-A000902 | Micro, NUT |
| TYLMI-20180117 | Water | 18-A000903 | Micro, NUT |
| TYLMO-20180117 | Water | 18-A000904 | Micro, NUT |
| QA-41-20180117 | Water | 18-A000905 | Micro, NUT |

Your samples were received on Thursday, January 18, 2018. At the time of receipt, the samples were logged in and properly maintained prior to the subsequent analysis.

The analytical procedures used at AmTest are well documented and are typically derived from the protocols of the EPA, USDA, FDA or the Army Corps of Engineers.

Following the analytical data you will find the Quality Control (QC) results.

Please note that the detection limits that are listed in the body of the report refer to the Practical Quantitation Limits (PQL's), as opposed to the Method Detection Limits (MDL's).

Am Test Inc.
13600 NE 126TH PL
Suite C
Kirkland, WA 98034
(425) 885-1664

**Professional
Analytical
Services**

Feb 9 2018
On-Site Environmental
continued . . .

If you should have any questions pertaining to the data package, please feel free to contact me.

Sincerely,


Aaron W. Young
Laboratory Manager

Project #: 14-05806-000
PO Number: 14-05806-000

BACT = Bacteriological
CONV = Conventional

MET = Metals
ORG = Organics

NUT=Nutrients
DEM=Demand

MIN=Minerals

Am Test Inc.
13600 NE 126TH PL
Suite C
Kirkland, WA 98034
(425) 885-1664
www.amtestlab.com



*Professional
Analytical
Services*

ANALYSIS REPORT

On-Site Environmental
14648 NE 95th ST
Redmond, WA 98052
Attention: David Baumeister
Project Name: REDMOND PAIRED WATERSHED STUDY
Project #: 14-05806-000
PO Number: 14-05806-000
All results reported on an as received basis.

Date Received: 01/18/18
Date Reported: 2/ 9/18

AMTEST Identification Number 18-A000891
Client Identification COLM-20180117
Sampling Date 01/17/18, 18:40

Results

| PARAMETER | RESULT | UNITS | Q | D.L. | METHOD | ANALYST | DATE |
|--------------------------|--------|------------|---|------|-----------|---------|----------|
| Fecal Coliform | 17. | CFU/100 ml | | 1 | SM 9222D | JM | 01/18/18 |
| Total Nitrogen (NOX&TKN) | 0.63 | mg/l | | 0.1 | | | |
| Total Nitrogen (TKN) | 0.572 | mg/l | | 0.1 | SM4500N | JC | 02/06/18 |
| Nitrate + Nitrite | 0.061 | mg/l | | 0.01 | SM4500NO3 | JC | 01/22/18 |

AMTEST Identification Number **18-A000892**
Client Identification **COUMI-20180117**
Sampling Date **01/17/18, 16:15**

Results

| PARAMETER | RESULT | UNITS | Q | D.L. | METHOD | ANALYST | DATE |
|--------------------------|--------|------------|---|------|-----------|---------|----------|
| Fecal Coliform | 90. | CFU/100 ml | | 1 | SM 9222D | JM | 01/18/18 |
| Total Nitrogen (NOX&TKN) | 1.02 | mg/l | | 0.1 | | | |
| Total Nitrogen (TKN) | 0.823 | mg/l | | 0.1 | SM4500N | JC | 02/06/18 |
| Nitrate + Nitrite | 0.20 | mg/l | | 0.01 | SM4500NO3 | JC | 01/22/18 |

AMTEST Identification Number **18-A000893**
Client Identification **COUMO-20180117**
Sampling Date **01/17/18, 15:50**

Results

| PARAMETER | RESULT | UNITS | Q | D.L. | METHOD | ANALYST | DATE |
|--------------------------|--------|------------|---|------|-----------|---------|----------|
| Fecal Coliform | 700 | CFU/100 ml | | 1 | SM 9222D | JM | 01/18/18 |
| Total Nitrogen (NOX&TKN) | 1.24 | mg/l | | 0.1 | | | |
| Total Nitrogen (TKN) | 0.875 | mg/l | | 0.1 | SM4500N | JC | 02/06/18 |
| Nitrate + Nitrite | 0.36 | mg/l | | 0.01 | SM4500NO3 | JC | 01/22/18 |

AMTEST Identification Number **18-A000894**
Client Identification **EVAMS-20180117**
Sampling Date **01/17/18, 18:25**

Results

| PARAMETER | RESULT | UNITS | Q | D.L. | METHOD | ANALYST | DATE |
|--------------------------|--------|------------|---|------|-----------|---------|----------|
| Fecal Coliform | 22. | CFU/100 ml | | 1 | SM 9222D | JM | 01/18/18 |
| Total Nitrogen (NOX&TKN) | 2.33 | mg/l | | 0.1 | | | |
| Total Nitrogen (TKN) | 0.732 | mg/l | | 0.1 | SM4500N | JC | 02/06/18 |
| Nitrate + Nitrite | 1.6 | mg/l | | 0.01 | SM4500NO3 | JC | 01/22/18 |

AMTEST Identification Number **18-A000895**
Client Identification **EVALSS-20180117**
Sampling Date **01/17/18, 16:40**

Results

| PARAMETER | RESULT | UNITS | Q | D.L. | METHOD | ANALYST | DATE |
|--------------------------|--------|------------|---|------|-----------|---------|----------|
| Fecal Coliform | 70. | CFU/100 ml | | 1 | SM 9222D | JM | 01/18/18 |
| Total Nitrogen (NOX&TKN) | 1.83 | mg/l | | 0.1 | | | |
| Total Nitrogen (TKN) | 0.534 | mg/l | | 0.1 | SM4500N | JC | 02/06/18 |
| Nitrate + Nitrite | 1.3 | mg/l | | 0.01 | SM4500NO3 | JC | 01/22/18 |

AMTEST Identification Number **18-A000896**
Client Identification **MONMN-20180117**
Sampling Date **01/17/18, 18:05**

Results

| PARAMETER | RESULT | UNITS | Q | D.L. | METHOD | ANALYST | DATE |
|--------------------------|--------|------------|---|------|-----------|---------|----------|
| Fecal Coliform | 70. | CFU/100 ml | | 1 | SM 9222D | JM | 01/18/18 |
| Total Nitrogen (NOX&TKN) | 1.12 | mg/l | | 0.1 | | | |
| Total Nitrogen (TKN) | 0.808 | mg/l | | 0.1 | SM4500N | JC | 02/06/18 |
| Nitrate + Nitrite | 0.31 | mg/l | | 0.01 | SM4500NO3 | JC | 01/22/18 |

AMTEST Identification Number **18-A000897**
Client Identification **MONMS-20180117**
Sampling Date **01/17/18, 18:30**

Results

| PARAMETER | RESULT | UNITS | Q | D.L. | METHOD | ANALYST | DATE |
|--------------------------|--------|------------|---|------|-----------|---------|----------|
| Fecal Coliform | 300 | CFU/100 ml | | 1 | SM 9222D | JM | 01/18/18 |
| Total Nitrogen (NOX&TKN) | 1.02 | mg/l | | 0.1 | | | |
| Total Nitrogen (TKN) | 0.538 | mg/l | | 0.1 | SM4500N | JC | 02/06/18 |
| Nitrate + Nitrite | 0.48 | mg/l | | 0.01 | SM4500NO3 | JC | 01/22/18 |

AMTEST Identification Number **18-A000898**
Client Identification **MONM-20180117**
Sampling Date **01/17/18, 17:30**

Results

| PARAMETER | RESULT | UNITS | Q | D.L. | METHOD | ANALYST | DATE |
|--------------------------|--------|------------|---|------|-----------|---------|----------|
| Fecal Coliform | 250 | CFU/100 ml | | 1 | SM 9222D | JM | 01/18/18 |
| Total Nitrogen (NOX&TKN) | 1.02 | mg/l | | 0.1 | | | |
| Total Nitrogen (TKN) | 0.660 | mg/l | | 0.1 | SM4500N | JC | 02/06/18 |
| Nitrate + Nitrite | 0.36 | mg/l | | 0.01 | SM4500NO3 | JC | 01/22/18 |

AMTEST Identification Number **18-A000899**
Client Identification **SEIMN-20180117**
Sampling Date **01/17/18, 18:10**

Results

| PARAMETER | RESULT | UNITS | Q | D.L. | METHOD | ANALYST | DATE |
|--------------------------|--------|------------|---|------|-----------|---------|----------|
| Fecal Coliform | 17. | CFU/100 ml | | 1 | SM 9222D | JM | 01/18/18 |
| Total Nitrogen (NOX&TKN) | 0.74 | mg/l | | 0.1 | | | |
| Total Nitrogen (TKN) | 0.543 | mg/l | | 0.1 | SM4500N | JC | 02/06/18 |
| Nitrate + Nitrite | 0.20 | mg/l | | 0.01 | SM4500NO3 | JC | 01/22/18 |

AMTEST Identification Number **18-A000900**
Client Identification **SEIMS-20180117**
Sampling Date **01/17/18, 19:00**

Results

| PARAMETER | RESULT | UNITS | Q | D.L. | METHOD | ANALYST | DATE |
|--------------------------|--------|------------|---|------|-----------|---------|----------|
| Fecal Coliform | 200 | CFU/100 ml | | 1 | SM 9222D | JM | 01/18/18 |
| Total Nitrogen (NOX&TKN) | 1.16 | mg/l | | 0.1 | | | |
| Total Nitrogen (TKN) | 1.00 | mg/l | | 0.1 | SM4500N | JC | 02/06/18 |
| Nitrate + Nitrite | 0.16 | mg/l | | 0.01 | SM4500NO3 | JC | 01/22/18 |

AMTEST Identification Number **18-A000901**
Client Identification **TOSMI-20180117**
Sampling Date **01/17/18, 16:00**

Results

| PARAMETER | RESULT | UNITS | Q | D.L. | METHOD | ANALYST | DATE |
|--------------------------|--------|------------|---|------|-----------|---------|----------|
| Fecal Coliform | 62000 | CFU/100 ml | | 1 | SM 9222D | JM | 01/18/18 |
| Total Nitrogen (NOX&TKN) | 1.35 | mg/l | | 0.1 | | | |
| Total Nitrogen (TKN) | 0.849 | mg/l | | 0.1 | SM4500N | JC | 02/06/18 |
| Nitrate + Nitrite | 0.50 | mg/l | | 0.01 | SM4500NO3 | JC | 01/22/18 |

AMTEST Identification Number **18-A000902**
Client Identification **TOSMO-20180117**
Sampling Date **01/17/18, 16:30**

Results

| PARAMETER | RESULT | UNITS | Q | D.L. | METHOD | ANALYST | DATE |
|--------------------------|--------|------------|---|------|-----------|---------|----------|
| Fecal Coliform | 190000 | CFU/100 ml | | 1 | SM 9222D | JM | 01/18/18 |
| Total Nitrogen (NOX&TKN) | 1.89 | mg/l | | 0.1 | | | |
| Total Nitrogen (TKN) | 1.40 | mg/l | | 0.1 | SM4500N | JC | 02/06/18 |
| Nitrate + Nitrite | 0.49 | mg/l | | 0.01 | SM4500NO3 | JC | 01/22/18 |

AMTEST Identification Number **18-A000903**
Client Identification **TYLMI-20180117**
Sampling Date **01/17/18, 17:40**

Results

| PARAMETER | RESULT | UNITS | Q | D.L. | METHOD | ANALYST | DATE |
|--------------------------|--------|------------|---|------|-----------|---------|----------|
| Fecal Coliform | 80. | CFU/100 ml | | 1 | SM 9222D | JM | 01/18/18 |
| Total Nitrogen (NOX&TKN) | 1.06 | mg/l | | 0.1 | | | |
| Total Nitrogen (TKN) | 0.648 | mg/l | | 0.1 | SM4500N | JC | 02/06/18 |
| Nitrate + Nitrite | 0.41 | mg/l | | 0.01 | SM4500NO3 | JC | 01/22/18 |

AMTEST Identification Number **18-A000904**
Client Identification **TYLMO-20180117**
Sampling Date **01/17/18, 17:10**


Results

| PARAMETER | RESULT | UNITS | Q | D.L. | METHOD | ANALYST | DATE |
|--------------------------|--------|------------|---|------|-----------|---------|----------|
| Fecal Coliform | 350 | CFU/100 ml | | 1 | SM 9222D | JM | 01/18/18 |
| Total Nitrogen (NOX&TKN) | 1.09 | mg/l | | 0.1 | | | |
| Total Nitrogen (TKN) | 0.669 | mg/l | | 0.1 | SM4500N | JC | 02/06/18 |
| Nitrate + Nitrite | 0.42 | mg/l | | 0.01 | SM4500NO3 | JC | 01/22/18 |

AMTEST Identification Number **18-A000905**
Client Identification **QA-41-20180117**
Sampling Date **01/17/18, 16:40**

Results

| PARAMETER | RESULT | UNITS | Q | D.L. | METHOD | ANALYST | DATE |
|--------------------------|--------|------------|---|------|-----------|---------|----------|
| Fecal Coliform | 52. | CFU/100 ml | | 1 | SM 9222D | JM | 01/18/18 |
| Total Nitrogen (NOX&TKN) | 1.89 | mg/l | | 0.1 | | | |
| Total Nitrogen (TKN) | 0.589 | mg/l | | 0.1 | SM4500N | JC | 02/06/18 |
| Nitrate + Nitrite | 1.3 | mg/l | | 0.01 | SM4500NO3 | JC | 01/22/18 |


Aaron W. Young
Laboratory Manager

QC Summary for sample numbers: 18-A000891 to 18-A000905

DUPLICATES

| SAMPLE # | ANALYTE | UNITS | SAMPLE VALUE | DUP VALUE | RPD |
|------------|----------------------|------------|--------------|-----------|------|
| 18-A000891 | Fecal Coliform | CFU/100 ml | 17. | 12. | 34. |
| 18-A000905 | Fecal Coliform | CFU/100 ml | 52. | 74. | 35. |
| 18-A000892 | Total Nitrogen (TKN) | mg/l | 0.823 | 0.970 | 16. |
| 18-A000902 | Total Nitrogen (TKN) | mg/l | 1.40 | 1.40 | 0.00 |
| 18-A000905 | Total Nitrogen (TKN) | mg/l | 0.589 | 0.546 | 7.6 |
| 18-A001167 | Total Nitrogen (TKN) | mg/l | 0.545 | 0.481 | 12. |
| 18-A000331 | Nitrate + Nitrite | mg/l | 4.6 | 5.4 | 16. |
| 18-A000478 | Nitrate + Nitrite | mg/l | 0.37 | 0.38 | 2.7 |
| 18-A000586 | Nitrate + Nitrite | mg/l | 0.47 | 0.47 | 0.00 |
| 18-A000596 | Nitrate + Nitrite | mg/l | 0.36 | 0.35 | 2.8 |
| 18-A000629 | Nitrate + Nitrite | mg/l | 0.58 | 0.58 | 0.00 |
| 18-A000895 | Nitrate + Nitrite | mg/l | 1.3 | 1.3 | 0.00 |
| 18-A000905 | Nitrate + Nitrite | mg/l | 1.3 | 1.3 | 0.00 |
| 18-A000949 | Nitrate + Nitrite | mg/l | 0.18 | 0.18 | 0.00 |
| 18-A000959 | Nitrate + Nitrite | mg/l | 0.027 | 0.030 | 11. |

MATRIX SPIKES

| SAMPLE # | ANALYTE | UNITS | SAMPLE VALUE | SMPL+ SPK | SPK AMT | RECOVERY |
|------------|----------------------|-------|--------------|-----------|---------|----------|
| 18-A000892 | Total Nitrogen (TKN) | mg/l | 0.823 | 2.78 | 2.00 | 97.85 % |
| 18-A000902 | Total Nitrogen (TKN) | mg/l | 1.40 | 3.40 | 2.00 | 100.00 % |
| 18-A000905 | Total Nitrogen (TKN) | mg/l | 0.589 | 2.52 | 2.00 | 96.55 % |
| 18-A001167 | Total Nitrogen (TKN) | mg/l | 0.545 | 2.57 | 2.00 | 101.25 % |
| 18-A000331 | Nitrate + Nitrite | mg/l | 4.6 | 9.6 | 5.0 | 100.00 % |
| 18-A000478 | Nitrate + Nitrite | mg/l | 0.37 | 1.4 | 1.0 | 103.00 % |
| 18-A000586 | Nitrate + Nitrite | mg/l | 0.47 | 1.4 | 1.0 | 93.00 % |
| 18-A000596 | Nitrate + Nitrite | mg/l | 0.36 | 1.3 | 1.0 | 94.00 % |
| 18-A000629 | Nitrate + Nitrite | mg/l | 0.58 | 1.5 | 1.0 | 92.00 % |
| 18-A000895 | Nitrate + Nitrite | mg/l | 1.3 | 2.3 | 1.0 | 100.00 % |
| 18-A000905 | Nitrate + Nitrite | mg/l | 1.3 | 2.2 | 1.0 | 90.00 % |
| 18-A000949 | Nitrate + Nitrite | mg/l | 0.18 | 1.1 | 1.0 | 92.00 % |
| 18-A000959 | Nitrate + Nitrite | mg/l | 0.027 | 0.94 | 1.0 | 91.30 % |

QC Summary for sample numbers: 18-A000891 to 18-A000905...

STANDARD REFERENCE MATERIALS

| ANALYTE | UNITS | TRUE VALUE | MEASURED VALUE | RECOVERY |
|----------------------|-------|------------|----------------|----------|
| Total Nitrogen (TKN) | mg/l | 1.00 | 1.04 | 104. % |
| Total Nitrogen (TKN) | mg/l | 1.00 | 1.05 | 105. % |
| Nitrate + Nitrite | mg/l | 1.0 | 0.98 | 98.0 % |
| Nitrate + Nitrite | mg/l | 1.0 | 1.0 | 100. % |
| Nitrate + Nitrite | mg/l | 1.0 | 0.96 | 96.0 % |

BLANKS

| ANALYTE | UNITS | RESULT |
|----------------------|------------|--------|
| Fecal Coliform | CFU/100 ml | < 1 |
| Fecal Coliform | CFU/100 ml | < 1 |
| Total Nitrogen (TKN) | mg/l | < 0.1 |
| Total Nitrogen (TKN) | mg/l | < 0.1 |
| Nitrate + Nitrite | mg/l | < 0.01 |
| Nitrate + Nitrite | mg/l | < 0.01 |
| Nitrate + Nitrite | mg/l | < 0.01 |



14648 NE 95th Street, Redmond, WA 98052 · (425) 883-3881

Laboratory: AmTest Laboratories

Attention: Aaron Young

13600 NE 126th PI Kirkland, WA 98034

Phone Number: (425) 885-1664

Turnaround Request

1 Day 2 Day 3 Day

Standard

Other: _____

Laboratory Reference #: 01-190

Project Manager: Blair Goodrow

email: bgoodrow@onsite-env.com

Project Number: 14-05806-000

Project Name: Redmond Paired Watershed Study

| Lab ID | Sample Identification | Date Sampled | Time Sampled | Matrix | # of Cont. | Requested Analyses |
|--|-----------------------|--------------|--------------|--------|------------|---|
| 891 92 93 94 95 96 97 98 99 900 | 1 COLM-20180117 | 1/17/18 | 18:40 | Water | 2 | Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N |
| | 2 COUMI-20180117 | 1/17/18 | 16:15 | Water | 2 | Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N |
| | 3 COUMO-20180117 | 1/17/18 | 15:50 | Water | 2 | Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N |
| | 4 EVAMS-20180117 | 1/17/18 | 16:25 | Water | 2 | Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N |
| | 5 EVALSS-20180117 | 1/17/18 | 16:40 | Water | 2 | Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N |
| | 6 MONMN-20180117 | 1/17/18 | 18:05 | Water | 2 | Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N |
| | 7 MONMS-20180117 | 1/17/18 | 18:30 | Water | 2 | Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N |
| | 8 MONM-20180117 | 1/17/18 | 17:30 | Water | 2 | Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N |
| | 9 SEIMN-20180117 | 1/17/18 | 18:10 | Water | 2 | Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N |
| | 10 SEIMS-20180117 | 1/17/18 | 19:00 | Water | 2 | Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N |

| Signature | Company | Date | Time | Comments/Special Instructions |
|------------------|------------|---------|------|--|
| | OnSite Env | 1/18/18 | 7:05 | EDDs - CSV Reporting Limits: Fecal Coliform - 1.0 cfu/100ml Total Nitrogen - .10 mg/L |
| Received by: | Amtest | 1/18/18 | 7:05 | |
| Relinquished by: | T-4.8 | | | |
| Received by: | | | | |
| Relinquished by: | | | | |
| Received by: | | | | |



14648 NE 95th Street, Redmond, WA 98052 - (425) 883-3881

Laboratory: AmTest Laboratories

Attention: Aaron Young

13600 NE 126th PI Kirkland, WA 98034

Phone Number: (425) 885-1664

Turnaround Request

1 Day 2 Day 3 Day

Standard

Other: _____

Laboratory Reference #: 01-190

Project Manager: Blair Goodrow

email: bgoodrow@onsite-env.com

Project Number: 14-05806-000

Project Name: Redmond Paired Watershed Study

| Lab ID | Sample Identification | Date Sampled | Time Sampled | Matrix | # of Cont. | Requested Analyses |
|-----------|-----------------------|--------------|--------------|--------|------------|---|
| 901 11 | TOSMI-20180117 | 1/17/18 | 16:00 | Water | 2 | Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N |
| 902 12 | TOSMO-20180117 | 1/17/18 | 16:30 | Water | 2 | Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N |
| 903 13 | TYLMI-20180117 | 1/17/18 | 17:40 | Water | 2 | Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N |
| 904 14 | TYLMO-20180117 | 1/17/18 | 17:10 | Water | 2 | Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N |
| 905 15 | QA-41-20180117 | 1/17/18 | 16:40 | Water | 2 | Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |

| Signature | Company | Date | Time | Comments/Special Instructions |
|-------------------------------------|-------------------|---------|------|--|
| Relinquished by: <i>[Signature]</i> | <i>OnSite Env</i> | 1/19/18 | 705 | EDDs - CSV Reporting Limits: Fecal Coliform - 1.0 cfu/100ml Total Nitrogen - .10 mg/L |
| Received by: <i>[Signature]</i> | <i>AmTest</i> | 1/19/18 | 705 | |
| Relinquished by: | <i>T=4.8</i> | | | |
| Received by: | | | | |
| Relinquished by: | | | | |
| Received by: | | | | |



14648 NE 95th Street, Redmond, WA 98052
Telephone: 425.883.3881

Company: Herrera Environmental Consultants
Project No.: 14-05806-000
Project Name: Redmond Paired Watershed Study
Project Manager: George Iftner

CHAIN OF CUSTODY

Turnaround Requested:

 1 Day
 2 Day
 3 Day
 Standard

Laboratory No.

01-190

Requested Analyses

| | | | | | | | | | | | | | | | | | | |
|-----------------------------------|-----------------------|---------------------------------|-------------------------------------|---------------------------|------------------------------|------------------------------|-----------------------------|-----------------------------------|--|--|--|--|--|--|--|--|--|--|
| Total Suspended Solids (SM 2540D) | Turbidity (EPA 181.1) | Hardness (EPA 200.7 / SM 2340B) | Dissolved Organ Carbon (SM 5310B) * | Fecal Coliform (SM 9222D) | Total Phosphorus (EPA 365.1) | Total Nitrogen (SM 4500 N-B) | Total Cu and Zn (EPA 200.8) | Dissolved Cu and Zn (EPA 200.8) * | | | | | | | | | | |
|-----------------------------------|-----------------------|---------------------------------|-------------------------------------|---------------------------|------------------------------|------------------------------|-----------------------------|-----------------------------------|--|--|--|--|--|--|--|--|--|--|

| Lab ID | Sample Identification | Date Sampled | Time Sampled | Matrix | # of Cont. | Total Suspended Solids (SM 2540D) | Turbidity (EPA 181.1) | Hardness (EPA 200.7 / SM 2340B) | Dissolved Organ Carbon (SM 5310B) * | Fecal Coliform (SM 9222D) | Total Phosphorus (EPA 365.1) | Total Nitrogen (SM 4500 N-B) | Total Cu and Zn (EPA 200.8) | Dissolved Cu and Zn (EPA 200.8) * | | | | |
|--------|-----------------------|--------------|--------------|--------|------------|-----------------------------------|-----------------------|---------------------------------|-------------------------------------|---------------------------|------------------------------|------------------------------|-----------------------------|-----------------------------------|--|--|--|--|
| 1 | COLM-2018 0117 | 1-17-18 | 18:40 | Water | 7 | X | X | X | X | X | X | X | X | X | | | | |
| 2 | COUMI-2018 0117 | | 18:15 | Water | 7 | X | X | X | X | X | X | X | X | X | | | | |
| 3 | COUMO-2018 0117 | | 15:50 | Water | 7 | X | X | X | X | X | X | X | X | X | | | | |
| 4 | EVAMS-2018 0117 | | 18:25 | Water | 7 | X | X | X | X | X | X | X | X | X | | | | |
| 5 | EVALSS-2018 0117 | | 18:40 | Water | 7 | X | X | X | X | X | X | X | X | X | | | | |
| 6 | MONMN-2018 0117 | | 18:05 | Water | 7 | X | X | X | X | X | X | X | X | X | | | | |
| 7 | MONMS-2018 0117 | | 18:30 | Water | 7 | X | X | X | X | X | X | X | X | X | | | | |
| 8 | MONM-2018 0117 | | 17:30 | Water | 7 | X | X | X | X | X | X | X | X | X | | | | |
| 9 | SEIMN-2018 0117 | | 18:10 | Water | 7 | X | X | X | X | X | X | X | X | X | | | | |
| 10 | SEIMS-2018 0117 | | 19:00 | Water | 7 | X | X | X | X | X | X | X | X | X | | | | |
| 11 | TOSMI-2018 0117 | | 18:00 | Water | 7 | X | X | X | X | X | X | X | X | X | | | | |
| 12 | TOSMO-2018 0117 | | 18:30 | Water | 7 | X | X | X | X | X | X | X | X | X | | | | |
| 13 | TYLMI-2018 0117 | | 17:40 | Water | 7 | X | X | X | X | X | X | X | X | X | | | | |
| 14 | TYLMO-2018 0117 | | 17:10 | Water | 7 | X | X | X | X | X | X | X | X | X | | | | |
| 15 | QA 41-2018 0117 | | 18:40 | Water | 7 | X | X | X | X | X | X | X | X | X | | | | |

Relinquished by Mary Mullen Date 1-17-18 Received by [Signature] Date 1/17/18
 Firm Herrera Time 2:05 Firm OnSite Time 2:05
 Relinquished by _____ Date _____ Received by _____ Date _____
 Firm _____ Time _____ Firm _____ Time _____

Comments:
 * - field filtered with 0.45 µm filter within 15 minutes of collecting sample



CHAIN OF CUSTODY

14648 NE 95th Street, Redmond, WA 98052
Telephone: 425.883.3881

Turnaround Requested:

_____ 1 Day

_____ 2 Day

_____ 3 Day

X Standard

Laboratory No. **01-190**

Requested Analyses

Company: Herrera Environmental Consultants
Project No.: 14-05806-000
Project Name: Redmond Paired Watershed Study
Project Manager: George Ifner

| Lab ID | Sample Identification | Date Sampled | Time Sampled | Matrix | # of Cont. | Total Suspended Solids (SM 2540D) | Turbidity (EPA 181.1) | Hardness (EPA 200.7 / SM 2340B) | Dissolved Organ Carbon (SM 5310B) * | Fecal Coliform (SM 9222D) | Total Phosphorus (EPA 365.1) | Total Nitrogen (SM 4500 N-B) | Total Cu and Zn (EPA 200.8) | Dissolved Cu and Zn (EPA 200.8) * |
|--------|-----------------------|--------------|--------------|--------|------------|-----------------------------------|-----------------------|---------------------------------|-------------------------------------|---------------------------|------------------------------|------------------------------|-----------------------------|-----------------------------------|
| 1 | COLM-2018 0117 | 1.17.18 | 18:40 | Water | 7 | X | X | X | X | X | X | X | X | X |
| 2 | COUMI-2018 0117 | | 18:15 | Water | 7 | X | X | X | X | X | X | X | X | X |
| 3 | COUMO-2018 0117 | | 15:50 | Water | 7 | X | X | X | X | X | X | X | X | X |
| 4 | EVAMS-2018 0117 | | 18:25 | Water | 7 | X | X | X | X | X | X | X | X | X |
| 5 | EVALSS-2018 0117 | | 18:40 | Water | 7 | X | X | X | X | X | X | X | X | X |
| 6 | MONMN-2018 0117 | | 18:05 | Water | 7 | X | X | X | X | X | X | X | X | X |
| 7 | MONMS-2018 0117 | | 18:30 | Water | 7 | X | X | X | X | X | X | X | X | X |
| 8 | MONM-2018 0117 | | 17:30 | Water | 7 | X | X | X | X | X | X | X | X | X |
| 9 | SEIMN-2018 0117 | | 18:10 | Water | 7 | X | X | X | X | X | X | X | X | X |
| 10 | SEIMS-2018 0117 | | 19:00 | Water | 7 | X | X | X | X | X | X | X | X | X |
| 11 | TOSMI-2018 0117 | | 18:00 | Water | 7 | X | X | X | X | X | X | X | X | X |
| 12 | TOSMO-2018 0117 | | 18:30 | Water | 7 | X | X | X | X | X | X | X | X | X |
| 13 | TYLMI-2018 0117 | | 17:40 | Water | 7 | X | X | X | X | X | X | X | X | X |
| 14 | TYLMO-2018 0117 | | 17:10 | Water | 7 | X | X | X | X | X | X | X | X | X |
| 15 | QA 41-2018 0117 | | 18:40 | Water | 7 | X | X | X | X | X | X | X | X | X |

Relinquished by May Muhl Date 1.17.18 Received by [Signature] Date 1/17/18

Firm Herrera Time 2:05 Firm OnSite Time 2:05

Relinquished by _____ Date _____ Received by _____ Date _____

Firm _____ Time _____ Firm _____ Time _____

Comments:
* - field filtered with 0.45 µm filter within 15 minutes of collecting sample

METER CALIBRATION LOG - Redmond Paired Watershed Study



| | | | |
|-----------------------------------|-----------------|-------|-------|
| Project Number: | 14-05806-000 | | |
| Personnel Performing Calibration: | M. Miller | | |
| Meter: | Pro Plus | | |
| Date/Time: | 1.17.19 / 14:30 | | |
| Barometric Pressure Start of Day: | mmHg: 751.4 | Time: | 14:30 |
| Barometric Pressure End of Day: | mmHg: 753.7 | Time: | 10:30 |

| |
|---|
| Calibration Procedures: |
| Rinse Multimeter Sonde Between Each Operation |
| Rinse 3 times with tap water, 3 times with deionized water, then 3 times with the solution to be used for calibrating or testing. |
| Conductivity Calibration Notes: |

| PRE Field Run CALIBRATION | Meter Reading | Buffer / Cal Std | Temp °C | Comments |
|---------------------------|---------------|------------------|---------|----------------|
| Conductivity (µS/cm) | 5.2 | 0 | 23.7 | lab DI water |
| Conductivity (µS/cm) | 1071 | 1,000 | 23.3 | |
| Conductivity (µS/cm) | 99.7 | 100 | 22.9 | |
| DO % Saturation | 98.3 | 100 | 20.9 | calibrated x 2 |

| POST Field Run CHECK | Meter Reading | Buffer / Cal Std | Temp °C | Comments |
|----------------------|--------------------|------------------|---------|--------------|
| Conductivity (µS/cm) | 10.29.7 | 0 | 23.5 | lab DI water |
| Conductivity (µS/cm) | 100.9 | 100 | 23.0 | |
| DO % Saturation | 99.8 | 100 | 21.0 | |

→ done 1.19.18 @ 9:30
multimeter did not work immediately

1. Dry the conductivity probe with a lab tissue (e.g., KimWipes®) and DI water.
 2. Fill calibration cup to within a centimeter of the top of the calibration cup with DI water (0 µS).
 3. Fill the calibration cup with 1,000 µS standard so that the temperature/conductivity probe is submerged.
 4. Make sure there are no bubbles in the cell; wait 2 minutes.
 5. Enter the appropriate standard value (1,000 µS/cm or 1.0 mS/cm) for Sp Cond.
 6. Check conductivity using 100 µS/cm standard.
- Dissolved Oxygen Calibration Notes:**
1. Fill the calibration cup with about 1/2 inch of DI; it should be below the sensor cap.
 2. Use KimWipes® to dry any droplets from the sensor cap.
 3. Invert calibration cup's cap and gently rest it on the cup.
 4. Wait 5 minutes, making sure that temperature stabilizes.
 5. Determine local barometric pressure (mm Hg) and enter this value into the meter.
 6. Click "Calibrate". "Calibrate Successful" will be displayed.
 7. To retain calibration accuracy between measurements, store with the sensor immersed in water or within a water-saturated air environment such as a sealed storage cup with at least 10 ml of water.
 8. It is important to have the water-saturated air and the sensor at the same temperature. Therefore, store a jar of DI in the same environment as the sonde and calibrate in a similar air temperature as the water and sonde.
 9. Keep probe out of direct sun or wind.

METER CALIBRATION LOG - Redmond Paired Watershed Study

| | | | |
|-----------------------------------|-----------------|-------|-------|
| Project Number: | 14-05806-000 | | |
| Personnel Performing Calibration: | M Mullen | | |
| Meter: | Pro DSS #1 | | |
| Date/Time: | 1-17-18 / 10:30 | | |
| Barometric Pressure Start of Day: | mmHg: 751.1 | Time: | 11:30 |
| Barometric Pressure End of Day: | mmHg: 753.7 | Time: | 10:30 |

Calibration Procedures:

Rinse Multimetric Sonde Between Each Operation

Rinse 3 times with tap water, 3 times with deionized water, then 3 times with the solution to be used for calibrating or testing.

Conductivity Calibration Notes:

1. Dry the conductivity probe with a lab tissue (e.g., KimWipes®) and DI water.
2. Fill calibration cup to within a centimeter of the top of the calibration cup with DI water (0 µS).
3. Fill the calibration cup with 1,000 µS standard so that the temperature/conductivity probe is submerged.
4. Make sure there are no bubbles in the cell; wait 2 minutes.
5. Enter the appropriate standard value (1,000 µS/cm or 1.0 mS/cm) for Sp Cond.
6. Check conductivity using 100 µS/cm standard.

Dissolved Oxygen Calibration Notes:

1. Fill the calibration cup with about 1/2 inch of DI; it should be below the sensor cap.
2. Use KimWipes® to dry any droplets from the sensor cap.
3. Invert calibration cup's cap and gently rest it on the cup.
4. Wait 5 minutes, making sure that temperature stabilizes.
5. Determine local barometric pressure (mm Hg) and enter this value into the meter.
6. Click "Calibrate". "Calibrate Successful" will be displayed.
7. To retain calibration accuracy between measurements, store with the sensor immersed in water or within a water-saturated air environment such as a sealed storage cup with at least 10 ml of water.
8. It is important to have the water-saturated air and the sensor at the same temperature. Therefore, store a jar of DI in the same environment as the sonde and calibrate in a similar air temperature as the water and sonde.
9. Keep probe out of direct sun or wind.



| PRE Field Run CALIBRATION | Meter Reading | Buffer / Cal Std | Temp °C | Comments |
|---------------------------|---------------|------------------|---------|--------------|
| Conductivity (µS/cm) | 4.4 | 0 | 23.2 | lab DI water |
| Conductivity (µS/cm) | 99.8 | 1,000 | 22.9 | |
| Conductivity (µS/cm) | 99.9 | 100 | 22.6 | |
| DO % Saturation | 100.1 | 100 | 20.0 | |

| POST Field Run CHECK | Meter Reading | Buffer / Cal Std | Temp °C | Comments |
|----------------------|---------------|------------------|---------|--------------|
| Conductivity (µS/cm) | 4.3 | 0 | 23.1 | lab DI water |
| Conductivity (µS/cm) | 100.1 | 100 | 22.6 | |
| DO % Saturation | 100.2 | 100 | 21.7 | |

H
M

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: M. Muller T. Gerzel

Sample Date: 1/17/18

Sample Time: 8:18:40

PDT:

SITE ID: COLM

Base Flow or Storm Event?

Field Filtered Time: 15:45
(Must filter within 15 minutes of collection)

PST:

Project Number: 14-05806-000



Project Name: Redmond Paired Watershed Study

Current Weather and Temp: rainy 49°

Water Quality Sampling

Sample ID: COLM-20180117

| Parameter | Bottle Type | Bottle Volume | # Bottles | Preservative | Duplicated? |
|---------------------------|-------------|---------------|-----------|--------------------------------|-------------|
| TSS and Turbidity | HDPE | 1L | 1 | NA | <u>NO</u> |
| DOC * | HDPE | 250 ml | 1 | HCL | ↓ |
| Fecal Col. Bact. | HDPE | 250 ml | 1 | EDTA | |
| T. Phosphorous | HDPE | 250 ml | 1 | H ₂ SO ₄ | |
| T. Nitrogen | HDPE | 250 ml | 1 | H ₂ SO ₄ | |
| Diss. Cu and Zn * | HDPE | 250 ml | 1 | HNO ₃ | |
| Hardness, Total Cu and Zn | HDPE | 500 ml | 1 | HNO ₃ | |

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID: _____

Filter blank sample ID: _____

Transfer blank sample ID: _____

Visual and Olfactory Conditions:

Clarity: clear
 Color: none
 Odor: none
 Sheen: none
 Floatables: foam

LABORATORY DELIVERY

Date: _____

Time: _____

Quality Assurance

Checked By: J. Leuth

Signature: _____

Date Checked: 2-16-18

Time: _____

Data Entered into Database?

YES

NO

initials: _____

Date Entered: _____

Time: _____

Notes: _____

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

YSI Pro Plus (15D100020)

YSI Pro DSS 1

YSI Pro DSS 2

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): 5.80

Reference Point (description): SG

Water Quality Measurements

Temperature (°C) 7.3°

Specific Conductivity (µs/cm) 26.8

Dissolved Oxygen (mg/L) 10.47

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: JM + MW

Sample Date: 1/17/18

Sample Time: 16:15

PDT:

SITE ID: COUMI

Base Flow or Storm Event? (circled)

Field Filtered Time: 16:15

PST: X

Project Number: 14-05806-000



HERRERA

Project Name: Redmond Paired Watershed Study

Current Weather and Temp: 53°F rain

Water Quality Sampling

Sample ID: COUMI 2018 0117

| Parameter | Bottle Type | Bottle Volume | # Bottles | Preservative | Duplicated? |
|---------------------------|-------------|---------------|-----------|--------------------------------|-------------|
| TSS and Turbidity | HDPE | 1L | 1 | NA | <u>NO</u> |
| DOC * | HDPE | 250 ml | 1 | HCL | ↓ |
| Fecal Col. Bact. | HDPE | 250 ml | 1 | EDTA | |
| T. Phosphorous | HDPE | 250 ml | 1 | H ₂ SO ₄ | |
| T. Nitrogen | HDPE | 250 ml | 1 | H ₂ SO ₄ | |
| Diss. Cu and Zn * | HDPE | 250 ml | 1 | HNO ₃ | |
| Hardness, Total Cu and Zn | HDPE | 500 ml | 1 | HNO ₃ | |

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID: _____
 Filter blank sample ID: _____
 Transfer blank sample ID: _____

Visual and Olfactory Conditions:

Clarity: Clear
 Color: light brown
 Odor: no
 Sheen: no
 Floatables: no

LABORATORY DELIVERY

Date: _____ Time: _____

Quality Assurance

Checked By: S. Leath Signature: _____
 Date Checked: 2-16-18 Time: _____
 Data Entered into Database? YES / NO _____ initials: _____
 Date Entered: _____ Time: _____
 Notes: _____

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

YSI Pro Plus (15D100020) _____
 YSI Pro DSS 1 X _____
 YSI Pro DSS 2 _____

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): 2.82
 Reference Point (description): staff gauge

Water Quality Measurements

Temperature (°C) 8.6
 Specific Conductivity (µs/cm) 4430 106.4
 Dissolved Oxygen (mg/L) 11.39

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: JM + VW

Sample Date: 1/17/18

Sample Time: 15:50

PDT:

SITE

ID: COUMO20180117

Base Flow or Storm Event? (Storm Event)

Field Filtered Time: 15:50

PST: X

Project Number: 14-05806-000



HERRERA

Project Name: Redmond Paired Watershed Study

Current Weather and Temp: 53°F light rain

Water Quality Sampling

Sample ID: COUMO20180117

| Parameter | Bottle Type | Bottle Volume | # Bottles | Preservative | Duplicated? |
|---------------------------|-------------|---------------|-----------|--------------------------------|-------------|
| TSS and Turbidity | HDPE | 1L | 1 | NA | <u>No</u> |
| DOC * | HDPE | 250 ml | 1 | HCL | ↓ |
| Fecal Col. Bact. | HDPE | 250 ml | 1 | EDTA | |
| T. Phosphorous | HDPE | 250 ml | 1 | H ₂ SO ₄ | |
| T. Nitrogen | HDPE | 250 ml | 1 | H ₂ SO ₄ | |
| Diss. Cu and Zn * | HDPE | 250 ml | 1 | HNO ₃ | |
| Hardness, Total Cu and Zn | HDPE | 500 ml | 1 | HNO ₃ | ↓ |

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID: _____

Filter blank sample ID: _____

Transfer blank sample ID: _____

Visual and Olfactory Conditions:

Clarity: clear

Color: brown

Odor: no

Sheen: no

Floatables: no

LABORATORY DELIVERY

Date: _____

Time: _____

Quality Assurance

Checked By: S. Cantor

Signature: [Signature]

Date Checked: 2-16-18

Time: _____

Data Entered into Database? YES

YES

NO

Initials: _____

Date Entered: _____

Time: _____

Notes: _____

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

YSI Pro Plus (15D100020) _____

YSI Pro DSS 1 X

YSI Pro DSS 2 _____

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): 1.45

Reference Point (description): Start gauge

Water Quality Measurements

Temperature (°C) 8.7

Specific Conductivity (µs/cm) 119.1

Dissolved Oxygen (mg/L) 8.74 11.27

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

| | | | |
|--|-----------------------------------|--|-------------------------------------|
| Field Personnel: <u>N. Muller</u> <u>J. Gergel</u> | SITE ID: <u>EVAMS</u> | | |
| Sample Date: <u>1/17/18</u> | Sample Time: <u>16:25</u> | PDT: <input type="checkbox"/> | |
| Base Flow or Storm Event? <input type="checkbox"/> | Field Filtered Time: <u>16:30</u> | PST: <input checked="" type="checkbox"/> | Project Number: <u>14-05806-000</u> |



Project Name: Redmond Paired Watershed Study

Current Weather and Temp: rainy 50°

Water Quality Sampling

Sample ID: EVAMS - 20180117

| Parameter | Bottle Type | Bottle Volume | # Bottles | Preservative | Duplicated? |
|---------------------------|-------------|---------------|-----------|--------------------------------|-------------|
| TSS and Turbidity | HDPE | 1L | 1 | NA | <u>NO</u> |
| DOC * | HDPE | 250 ml | 1 | HCL | ↓ |
| Fecal Col. Bact. | HDPE | 250 ml | 1 | EDTA | |
| T. Phosphorous | HDPE | 250 ml | 1 | H ₂ SO ₄ | |
| T. Nitrogen | HDPE | 250 ml | 1 | H ₂ SO ₄ | |
| Diss. Cu and Zn * | HDPE | 250 ml | 1 | HNO ₃ | |
| Hardness, Total Cu and Zn | HDPE | 500 ml | 1 | HNO ₃ | |

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID: _____

Filter blank sample ID: _____

Transfer blank sample ID: _____

Visual and Olfactory Conditions:

Clarity: clear

Color: none

Odor: none

Sheen: none

Floatables: none

LABORATORY DELIVERY

Date: _____ Time: _____

Quality Assurance

Checked By: Z. C. Smith Signature: [Signature]

Date Checked: 2-16-18 Time: _____

Data Entered into Database? YES NO initials: _____

Date Entered: _____ Time: _____

Notes: _____

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

YSI Pro Plus (15D100020)

YSI Pro DSS 1

YSI Pro DSS 2

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): 3.93

Reference Point (description): 36

Water Quality Measurements

Temperature (°C) 8.7

Specific Conductivity (µs/cm) 162.0

Dissolved Oxygen (mg/L) 11.33

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: M Muller J Gerag
 Sample Date: 2/17/18 Sample Time: 10:40 PDT:
 Base Flow or Storm Event? Field Filtered Time: 10:45 PST:
(Must filter within 15 minutes of collection)

SITE ID: EVALSS
 Project Number: 14-05806-000



Project Name: Redmond Paired Watershed Study
 Current Weather and Temp: rainy 49°

Water Quality Sampling

Sample ID: EVALSS-20180117

| Parameter | Bottle Type | Bottle Volume | # Bottles | Preservative | Duplicated? |
|---------------------------|-------------|---------------|-----------|--------------------------------|-------------|
| TSS and Turbidity | HDPE | 1L | 1 | NA | yes |
| DOC * | HDPE | 250 ml | 1 | HCL | |
| Fecal Col. Bact. | HDPE | 250 ml | 1 | EDTA | |
| T. Phosphorous | HDPE | 250 ml | 1 | H ₂ SO ₄ | |
| T. Nitrogen | HDPE | 250 ml | 1 | H ₂ SO ₄ | |
| Diss. Cu and Zn * | HDPE | 250 ml | 1 | HNO ₃ | |
| Hardness, Total Cu and Zn | HDPE | 500 ml | 1 | HNO ₃ | ✓ |

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump
 Duplicate sample ID: QA41-20180117
 Filter blank sample ID: _____
 Transfer blank sample ID: _____

Visual and Olfactory Conditions:
 Clarity: clear
 Color: none
 Odor: none
 Sheen: none
 Floatables: none

LABORATORY DELIVERY

Date: _____ Time: _____

Quality Assurance

Checked By: Z. Lenth Signature: [Signature]
 Date Checked: 2-16-18 Time: _____
 Data Entered into Database? YES NO initials: _____
 Date Entered: _____ Time: _____
 Notes: _____

Field Meter Calibration

Check which field meter was used and complete the meter calibration form
 YSI Pro Plus (15D100020) ✓
 YSI Pro DSS 1
 YSI Pro DSS 2

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)
 Stream Stage (ft): 2.30
 Reference Point (description): 56

Water Quality Measurements

Temperature (°C) 8.9
 Specific Conductivity (µs/cm) 116.6
 Dissolved Oxygen (mg/L) 97.7

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

| | | | |
|---|-----------------------------------|--|------------------------------|
| Field Personnel: <u>M+VW</u> | | | SITE ID: <u>MONMN</u> |
| Sample Date: <u>1/17/18</u> | Sample Time: <u>18:05</u> | PDT: <input type="checkbox"/> | |
| Base Flow or Storm Event? <input checked="" type="checkbox"/> | Field Filtered Time: <u>18:05</u> | PST: <input checked="" type="checkbox"/> | Project Number: 14-05806-000 |



Project Name: Redmond Paired Watershed Study

Current Weather and Temp: 49°F rain

Water Quality Sampling

Sample ID: MONMN20180117

| Parameter | Bottle Type | Bottle Volume | # Bottles | Preservative | Duplicated? |
|---------------------------|-------------|---------------|-----------|--------------------------------|-------------|
| TSS and Turbidity | HDPE | 1L | 1 | NA | <u>NO</u> |
| DOC * | HDPE | 250 ml | 1 | HCL | ↓ |
| Fecal Col. Bact. | HDPE | 250 ml | 1 | EDTA | |
| T. Phosphorous | HDPE | 250 ml | 1 | H ₂ SO ₄ | |
| T. Nitrogen | HDPE | 250 ml | 1 | H ₂ SO ₄ | |
| Diss. Cu and Zn * | HDPE | 250 ml | 1 | HNO ₃ | |
| Hardness, Total Cu and Zn | HDPE | 500 ml | 1 | HNO ₃ | |

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID: _____

Filter blank sample ID: _____

Transfer blank sample ID: _____

Visual and Olfactory Conditions:

| | |
|------------------------------|---------------------------------|
| Clarity: <u>light turbid</u> | Clarity: <u>light turbidity</u> |
| Color: <u>very light br</u> | Color: <u>very light brown</u> |
| Odor: <u>NO</u> | Odor: <u>NO</u> |
| Sheen: _____ | Sheen: <u>NO</u> |
| Floatables: _____ | Floatables: <u>NO</u> |

LABORATORY DELIVERY

Date: _____ Time: _____

Quality Assurance

Checked By: J. Leuter Signature: [Signature]

Date Checked: 2-16-18 Time: _____

Data Entered into Database? YES NO initials: _____

Date Entered: _____ Time: _____

Notes: _____

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

YSI Pro Plus (15D100020) _____

YSI Pro DSS 1 X

YSI Pro DSS 2 _____

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): 0.34

Reference Point (description): Staff gauge

Water Quality Measurements

Temperature (°C) 7.8

Specific Conductivity (µs/cm) 110.9

Dissolved Oxygen (mg/L) 11.30

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: JM + VW

Sample Date: 1/17/18

Sample Time: 18:30

PDT:

SITE ID: MONMS

Base Flow or Storm Event?

Field Filtered Time: 18:30

PST: X

Project Number: 14-05806-000

(Must filter within 15 minutes of collection)



HERRERA

Project Name: Redmond Paired Watershed Study

Current Weather and Temp: 49°F + rain

Water Quality Sampling

Sample ID: MONMS 2018 0117

| Parameter | Bottle Type | Bottle Volume | # Bottles | Preservative | Duplicated? |
|---------------------------|-------------|---------------|-----------|--------------------------------|-------------|
| TSS and Turbidity | HDPE | 1L | 1 | NA | NO |
| DOC * | HDPE | 250 ml | 1 | HCL | ↓ |
| Fecal Col. Bact. | HDPE | 250 ml | 1 | EDTA | |
| T. Phosphorous | HDPE | 250 ml | 1 | H ₂ SO ₄ | |
| T. Nitrogen | HDPE | 250 ml | 1 | H ₂ SO ₄ | |
| Diss. Cu and Zn * | HDPE | 250 ml | 1 | HNO ₃ | |
| Hardness, Total Cu and Zn | HDPE | 500 ml | 1 | HNO ₃ | |

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID:

Filter blank sample ID:

Transfer blank sample ID:

Visual and Olfactory Conditions:

Clarity: clear
 Color: no
 Odor: no
 Sheen: no
 Floatables: no

LABORATORY DELIVERY

Date:

Time:

Quality Assurance

Checked By: S. Lent

Signature:

Date Checked: 2-16-18

Time:

Data Entered into Database?

YES

NO

initials:

Date Entered:

Time:

Notes:

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

YSI Pro Plus (15D100020)

YSI Pro DSS 1 X

YSI Pro DSS 2

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): 9.45 6.45

Reference Point (description): top of PVC pipe to WS

Water Quality Measurements

Temperature (°C) 8.2

Specific Conductivity (µs/cm) 161.6

Dissolved Oxygen (mg/L) 10.15

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: M Muller J Geigel
 Sample Date: 1.17.18 Sample Time: 17:30
 Base Flow or Storm Event? (S) Field Filtered Time: 17:35
(Must filter within 15 minutes of collection)

SITE ID: MONM
 Project Number: 14-05806-000



Project Name: Redmond Paired Watershed Study
 Current Weather and Temp: 49° Rainy

Water Quality Sampling

Sample ID: MONM-20180117

| Parameter | Bottle Type | Bottle Volume | # Bottles | Preservative | Duplicated? |
|---------------------------|-------------|---------------|-----------|--------------------------------|-------------|
| TSS and Turbidity | HDPE | 1L | 1 | NA | <u>NO</u> |
| DOC * | HDPE | 250 ml | 1 | HCL | <u>↓</u> |
| Fecal Col. Bact. | HDPE | 250 ml | 1 | EDTA | <u>↓</u> |
| T. Phosphorous | HDPE | 250 ml | 1 | H ₂ SO ₄ | <u>↓</u> |
| T. Nitrogen | HDPE | 250 ml | 1 | H ₂ SO ₄ | <u>↓</u> |
| Diss. Cu and Zn * | HDPE | 250 ml | 1 | HNO ₃ | <u>↓</u> |
| Hardness, Total Cu and Zn | HDPE | 500 ml | 1 | HNO ₃ | <u>↓</u> |

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID: _____
 Filter blank sample ID: _____
 Transfer blank sample ID: _____

Visual and Olfactory Conditions:
 Clarity: cloudy
 Color: brown
 Odor: no
 Sheen: no
 Floatables: fean
 LABORATORY DELIVERY

Date: _____ Time: _____

Quality Assurance

Checked By: J. Geigel Signature: _____
 Date Checked: 2.16.18 Time: _____
 Data Entered into Database? YES NO Initials: _____
 Date Entered: _____ Time: _____
 Notes: _____

Field Meter Calibration

Check which field meter was used and complete the meter calibration form
 YSI Pro Plus (15D100020)
 YSI Pro DSS 1
 YSI Pro DSS 2

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)
 Stream Stage (ft): 2.18 NA
 Reference Point (description): SG NA

Water Quality Measurements

Temperature (°C) 7.9
 Specific Conductivity (µs/cm) 124.5
 Dissolved Oxygen (mg/L) 11.42

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: M. Mullen J. Geigel
 Sample Date: 1/17/18 Sample Time: 18:10 PDT:
 Base Flow or Storm Event? Field Filtered Time: 18:15 PST:
(Must filter within 15 minutes of collection)

SITE ID: SEIMN
 Project Number: 14-05806-000



Project Name: Redmond Paired Watershed Study
 Current Weather and Temp: rainy 49°

Water Quality Sampling

Sample ID: SEIMN-20180117

| Parameter | Bottle Type | Bottle Volume | # Bottles | Preservative | Duplicated? |
|---------------------------|-------------|---------------|-----------|--------------------------------|-------------|
| TSS and Turbidity | HDPE | 1L | 1 | NA | NO |
| DOC * | HDPE | 250 ml | 1 | HCL | ↓ |
| Fecal Col. Bact. | HDPE | 250 ml | 1 | EDTA | ↓ |
| T. Phosphorous | HDPE | 250 ml | 1 | H ₂ SO ₄ | ↓ |
| T. Nitrogen | HDPE | 250 ml | 1 | H ₂ SO ₄ | ↓ |
| Diss. Cu and Zn * | HDPE | 250 ml | 1 | HNO ₃ | ↓ |
| Hardness, Total Cu and Zn | HDPE | 500 ml | 1 | HNO ₃ | ↓ |

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID: _____
 Filter blank sample ID: _____
 Transfer blank sample ID: _____

Visual and Olfactory Conditions:

Clarity: Clear
 Color: light yellow
 Odor: none
 Sheen: none
 Floatables: none

LABORATORY DELIVERY

Date: _____ Time: _____

Quality Assurance

Checked By: S. Leith Signature: [Signature]
 Date Checked: 2-16-18 Time: _____
 Data Entered into Database? YES NO initials: _____
 Date Entered: _____ Time: _____
 Notes: _____

Field Meter Calibration

Check which field meter was used and complete the meter calibration form
 YSI Pro Plus (15D100020)
 YSI Pro DSS 1 _____
 YSI Pro DSS 2 _____

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)
 Stream Stage (ft): 0.53
 Reference Point (description): top of bolt

Water Quality Measurements

Temperature (°C) 7.9°
 Specific Conductivity (µs/cm) 43.8
 Dissolved Oxygen (mg/L) 11.59

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: JM+VW
 Sample Date: 11/17/18 Sample Time: 19:00 PDT:
 Base Flow or Storm Event? Storm Event? Field Filtered Time: 19:00 PST:
 (Must filter within 15 minutes of collection)

SITE ID: SIEMS
 Project Number: 14-05806-000



Project Name: Redmond Paired Watershed Study

Current Weather and Temp: 49°F + rain

Water Quality Sampling

Sample ID: SIEMS20180117

| Parameter | Bottle Type | Bottle Volume | # Bottles | Preservative | Duplicated? |
|---------------------------|-------------|---------------|-----------|--------------------------------|-------------|
| TSS and Turbidity | HDPE | 1L | 1 | NA | <u>NO</u> |
| DOC * | HDPE | 250 ml | 1 | HCL | ↓ |
| Fecal Col. Bact. | HDPE | 250 ml | 1 | EDTA | |
| T. Phosphorous | HDPE | 250 ml | 1 | H ₂ SO ₄ | |
| T. Nitrogen | HDPE | 250 ml | 1 | H ₂ SO ₄ | |
| Diss. Cu and Zn * | HDPE | 250 ml | 1 | HNO ₃ | |
| Hardness, Total Cu and Zn | HDPE | 500 ml | 1 | HNO ₃ | ↓ |

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID: _____
 Filter blank sample ID: _____
 Transfer blank sample ID: _____

Visual and Olfactory Conditions:

Clarity: clear
 Color: light brown
 Odor: no
 Sheen: no
 Floatables: no

LABORATORY DELIVERY

Date: _____ Time: _____

Quality Assurance

Checked By: [Signature] Signature: [Signature]
 Date Checked: 2-10-18 Time: _____
 Data Entered into Database? YES NO initials: _____
 Date Entered: _____ Time: _____
 Notes: _____

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

YSI Pro Plus (15D100020) _____
 YSI Pro DSS 1 _____
 YSI Pro DSS 2 _____

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): 0.96
 Reference Point (description): Staff gauge

Water Quality Measurements

Temperature (°C) 7.7
 Specific Conductivity (µs/cm) 51.8
 Dissolved Oxygen (mg/L) 11.02

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: M Mullen J Geigel
 Sample Date: 1.17.18 Sample Time: 16:00 PDT:
 Base Flow or Storm Event? Field Filtered Time: 10:05 PST:
(Must filter within 15 minutes of collection)

SITE ID: TOSMI
 Project Number: 14-05806-000



Project Name: Redmond Paired Watershed Study
 Current Weather and Temp: rainy 50°

Water Quality Sampling

Sample ID: TOSMI-20180117

| Parameter | Bottle Type | Bottle Volume | # Bottles | Preservative | Duplicated? |
|---------------------------|-------------|---------------|-----------|--------------------------------|-------------|
| TSS and Turbidity | HDPE | 1L | 1 | NA | <u>NO</u> |
| DOC * | HDPE | 250 ml | 1 | HCL | ↓ |
| Fecal Col. Bact. | HDPE | 250 ml | 1 | EDTA | |
| T. Phosphorous | HDPE | 250 ml | 1 | H ₂ SO ₄ | |
| T. Nitrogen | HDPE | 250 ml | 1 | H ₂ SO ₄ | |
| Diss. Cu and Zn * | HDPE | 250 ml | 1 | HNO ₃ | |
| Hardness, Total Cu and Zn | HDPE | 500 ml | 1 | HNO ₃ | |

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID: _____
 Filter blank sample ID: _____
 Transfer blank sample ID: _____

Visual and Olfactory Conditions:

Clarity: clear
 Color: none
 Odor: none
 Sheen: none
 Floatables: none

LABORATORY DELIVERY

Date: _____ Time: _____

Quality Assurance

Checked By: Z. Lentz Signature: [Signature]
 Date Checked: 2.16.18 Time: _____
 Data Entered into Database? YES NO initials: _____
 Date Entered: _____ Time: _____
 Notes: _____

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

YSI Pro Plus (15D100020)
 YSI Pro DSS 1
 YSI Pro DSS 2

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): 0.91
 Reference Point (description): SL

Water Quality Measurements

Temperature (°C) 9.8
 Specific Conductivity (µs/cm) 152.8
 Dissolved Oxygen (mg/L) 11.24

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: JM, VW
 Sample Date: 1/17/2018 Sample Time: 16:30 PDT:
 Base Flow or Storm Event? (Storm Event?) Field Filtered Time: 16:30 PST: X
 (Must filter within 15 minutes of collection)

SITE ID: TOSMO
 Project Number: 14-05806-000



Project Name: Redmond Paired Watershed Study
 Current Weather and Temp: 53F + Rain

Water Quality Sampling

Sample ID: TOSMO 20170117

| Parameter | Bottle Type | Bottle Volume | # Bottles | Preservative | Duplicated? |
|---|-------------|---------------|-----------|--------------------------------|-------------|
| TSS and Turbidity | HDPE | 1L | 1 | NA | <u>NO</u> |
| DOC * | HDPE | 250 ml | 1 | HCL | ↓ |
| Fecal Col. Bact. | HDPE | 250 ml | 1 | EDTA | |
| T. Phosphorous | HDPE | 250 ml | 1 | H ₂ SO ₄ | |
| T. Nitrogen | HDPE | 250 ml | 1 | H ₂ SO ₄ | |
| Diss. Cu and Zn * | HDPE | 250 ml | 1 | HNO ₃ | |
| Hardness, Total Cu and Zn | HDPE | 500 ml | 1 | HNO ₃ | |
| * - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump | | | | | |

Duplicate sample ID: _____
 Filter blank sample ID: _____
 Transfer blank sample ID: _____

Visual and Olfactory Conditions:

Clarity: turbid
 Color: brownish grey
 Odor: No
 Sheen: No
 Floatables: No

LABORATORY DELIVERY

Date: _____ Time: _____

Quality Assurance

Checked By: J. Smith Signature: _____
 Date Checked: 2-16-18 Time: _____
 Data Entered into Database? YES NO initials: _____
 Date Entered: _____ Time: _____
 Notes: _____

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

YSI Pro Plus (15D100020) _____
 YSI Pro DSS 1 X _____
 YSI Pro DSS 2 _____

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): 0.87

Reference Point (description): Staff gauge

Water Quality Measurements

Temperature (°C) 8.9

Specific Conductivity (µs/cm) 170.0

Dissolved Oxygen (mg/L) 11.36

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: JM + VW

Sample Date:

Sample Time: 17:40

PDT:

SITE ID:

TYLMI

Base Flow or Storm Event? (circled)

Field Filtered Time: 17:40

PST: X

Project Number: 14-05806-000



HERRERA

Project Name: Redmond Paired Watershed Study

Current Weather and Temp: 49°F + Rain

Water Quality Sampling

Sample ID: TYLMI20180117

| Parameter | Bottle Type | Bottle Volume | # Bottles | Preservative | Duplicated? |
|---------------------------|-------------|---------------|-----------|--------------------------------|-------------|
| TSS and Turbidity | HDPE | 1L | 1 | NA | <u>NO</u> |
| DOC * | HDPE | 250 ml | 1 | HCL | ↓ |
| Fecal Col. Bact. | HDPE | 250 ml | 1 | EDTA | |
| T. Phosphorous | HDPE | 250 ml | 1 | H ₂ SO ₄ | |
| T. Nitrogen | HDPE | 250 ml | 1 | H ₂ SO ₄ | |
| Diss. Cu and Zn * | HDPE | 250 ml | 1 | HNO ₃ | |
| Hardness, Total Cu and Zn | HDPE | 500 ml | 1 | HNO ₃ | ↓ |

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID:

Filter blank sample ID:

Transfer blank sample ID:

Visual and Olfactory Conditions:

Clarity: clear
 Color: light brown
 Odor: no
 Sheen: no
 Floatables: no

LABORATORY DELIVERY

Date:

Time:

Quality Assurance

Checked By: J. Le...

Signature: [Signature]

Date Checked: 2-16-18

Time:

Data Entered into Database?

YES

NO

initials:

Date Entered:

Time:

Notes:

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

YSI Pro Plus (15D100020)

YSI Pro DSS 1 X

YSI Pro DSS 2

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): ~~3.45~~ 4.45

Reference Point (description): top of culvert down to WS

Water Quality Measurements

Temperature (°C) 8.0

Specific Conductivity (µs/cm) 127.1

Dissolved Oxygen (mg/L) 11.16

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: JM + VW

Sample Date: 1/17/18

Sample Time: 17:10

PDT:

SITE ID: TYLMO

Base Flow or Storm Event? Storm Event

Field Filtered Time: 17:10

PST: X

Project Number: 14-05806-000

(Must filter within 15 minutes of collection)



HERRERA

Project Name: Redmond Paired Watershed Study

Current Weather and Temp: 53°F rain

Water Quality Sampling

Sample ID: TYLMO20180117

| Parameter | Bottle Type | Bottle Volume | # Bottles | Preservative | Duplicated? |
|---------------------------|-------------|---------------|-----------|--------------------------------|-------------|
| TSS and Turbidity | HDPE | 1L | 1 | NA | <u>NO</u> |
| DOC * | HDPE | 250 ml | 1 | HCL | ↓ |
| Fecal Col. Bact. | HDPE | 250 ml | 1 | EDTA | |
| T. Phosphorous | HDPE | 250 ml | 1 | H ₂ SO ₄ | |
| T. Nitrogen | HDPE | 250 ml | 1 | H ₂ SO ₄ | |
| Diss. Cu and Zn * | HDPE | 250 ml | 1 | HNO ₃ | |
| Hardness, Total Cu and Zn | HDPE | 500 ml | 1 | HNO ₃ | ↓ |

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID:

Filter blank sample ID:

Transfer blank sample ID:

Visual and Olfactory Conditions:

Clarity: light turbidity
 Color: light brown
 Odor: no
 Sheen: no
 Floatables: no

LABORATORY DELIVERY

Date: _____ Time: _____

Quality Assurance

Checked By: S. Lovell Signature: _____
 Date Checked: 2-16-18 Time: _____
 Data Entered into Database? YES NO Initials: _____
 Date Entered: _____ Time: _____
 Notes: _____

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

YSI Pro Plus (15D100020) _____

YSI Pro DSS 1 X

YSI Pro DSS 2 _____

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): 2.76

Reference Point (description): top of culvert down to WS

Water Quality Measurements

Temperature (°C) 8.4

Specific Conductivity (µs/cm) 46.7

Dissolved Oxygen (mg/L) 11.42



HERRERA

Data Quality Assurance Worksheet

Project Name/No./Client: Redmond Paired Watershed Study / 14-05806-000 / City of Redmond

Laboratory/Parameters: OnSite Environmental : TSS, turbidity, hardness, DOC, TP, Dissolved & Total Cu, Zn / AmTest: Total nitrogen, fecal coliform bacteria

Sample Date/Sample ID: 1/17/2018 / All sites, 1 FD (QA41) at EVALSS

By G. Catarra

Date 2/16/2018 Page 1 of 2

Checked: initials
JL

date 2/16/18

| Parameter | Completeness/ Methodology | Pre-preservation Holding Times (minutes) | | Total Holding Times (days) | | Method Blanks Reporting Limit | Matrix Spikes/ Surrogate Recovery (%) | | Lab Control Samples Recovery (%) | | Lab Duplicates RPD (%) | | Field Duplicates RPD (%) | | Instrument Calibration/ Performance | ACTION |
|-------------------------------------|------------------------------|--|------|-------------------------------|------|--|---|-------------------|--|-------------------|---------------------------|-------------------|-----------------------------|-------------------|---|--------|
| | | Reported | Goal | Reported | Goal | | Reported | Goal ¹ | Reported | Goal ¹ | Reported | Goal ¹ | Reported | Goal ¹ | | |
| TSS | OK / SM 2540D | NA | NA | 7 | ≤7 | ≤1.0 mg/L 1.0 mg/L | NA | NA | 96 | ±20 | 0 | ≤25 | 14 | ≤25 | OK | NONE |
| Turbidity | OK / EPA 180.1 | NA | NA | 1 | ≤2 | ≤0.1 NTU 0.1 NTU | NA | NA | NA | ±10 | 0 | ≤25 | 13 | ≤25 | OK | NONE |
| Hardness | OK / SM 2340B | NA | NA | 12 | ≤180 | ≤1.0 mg/L 1.0 mg/L | 101,102 | ±25 | 99 | ±15 | 5 | ≤20 | 1.5 | ≤20 | OK | NONE |
| DOC | OK / SM 5310B | <15 | ≤15 | 8 | ≤28 | ≤1.0 mg/L 1.0 mg/L | 91 | ±25 | 98 | ±15 | 0 | ≤20 | 6.7 | ≤20 | OK | NONE |
| Total Phosphorus | OK / EPA 365.1 | NA | NA | 9 | ≤28 | ≤0.01 mg/L 0.01 mg/L | 96 | ±25 | 101 | ±20 | NC | ≤20 | 0 | ≤20 | OK | NONE |
| Total Nitrogen (TKN + N+N) | OK/ SM 4500 N-B | NA | NA | 5-20 | ≤28 | ≤0.1 mg/L 0.1 mg/L | 90-100 | ±25 | 96-105 | ±20 | 0-14 | ≤20 | 9.8,0 | ≤20 | OK | NONE |

¹ If the sample or duplicate value is less than five times the reporting limit, the difference is calculated rather than the relative percent difference (RPD). The QA goal is a difference <2 times the detection limit instead of the number indicated in the goal column.

NA – not applicable or not available; NC – not calculable due to one or more values below the detection limit; NS – field duplicate not sampled.



Data Quality Assurance Worksheet

By G. Catarra

Project Name/No./Client: Redmond Paired Watershed Study / 14-05806-000 / City of Redmond

Date 2/16/2018 Page 2 of 2

Laboratory/Parameters: OnSite Environmental : TSS, turbidity, hardness, DOC, TP, Dissolved & Total Cu, Zn / AmTest: total nitrogen, fecal coliform bacteria

Checked: initials
JL

Sample Date/Sample ID: 1/17/2018 / All sites, 1 FD (QA41) at EVALSS

date 2/16/18

| Parameter | Completeness/ Methodology | Pre-preservation Holding Times (minutes) | | Total Holding Times (days) | | Method Blanks Reporting Limit | Matrix Spikes/ Surrogate Recovery (%) | | Lab Control Samples Recovery (%) | | Lab Duplicates RPD (%) | | Field Duplicates RPD (%) | | Instrument Calibration/ Performance | ACTION |
|------------------|------------------------------|--|------|-------------------------------|------|--|---|-------------------|--|------|---------------------------|-------------------|-----------------------------|-------------------|---|--------|
| | | Reported | Goal | Reported | Goal | | Reported | Goal ¹ | Reported | Goal | Reported | Goal ¹ | Reported | Goal ¹ | | |
| Total Copper | OK/ EPA 200.8 | NA | NA | 13,14 | ≤180 | ≤1.0 µg/L 1.0 µg/L | 98-103 | ±25 | NR | ±15 | NC,19 | ≤20 | NC | ≤20 | OK | NONE |
| Total Zinc | OK/ EPA 200.8 | NA | NA | 13,14 | ≤180 | ≤5.0 µg/L 5.0 µg/L | 103-118 | ±25 | NR | ±15 | NC,NC | ≤20 | NC | ≤20 | OK | NONE |
| Dissolved Copper | OK/ EPA 200.8 | <15 | ≤15 | 13 | ≤180 | ≤1.0 µg/L 1.0 µg/L | 87,88 | ±25 | NR | ±15 | NC | ≤20 | NC | ≤20 | OK | NONE |
| Dissolved Zinc | OK/ EPA 200.8 | <15 | ≤15 | 13 | ≤180 | ≤5.0 µg/L 5.0 µg/L | 99,101 | ±25 | NR | ±15 | NC | ≤20 | NC | ≤20 | OK | NONE |
| Fecal Coliform | OK/ SM 9222D | NA | NA | 1 | ≤1 | ≤1.0 cfu/ 100mL 10 cfu/ 100mL | NA | NA | NA | NA | 35,34 | ≤35 | 35 | ≤50 | OK | NONE |

¹ If the sample or duplicate value is less than five times the reporting limit, the difference is calculated rather than the relative percent difference (RPD). The QA goal is a difference <2 times the detection limit instead of the number indicated in the goal column.

NA – not applicable or not available; NC – not calculable due to one or more values below the detection limit; NS – field duplicate not sampled.



14648 NE 95th Street, Redmond, WA 98052 • (425) 883-3881

February 14, 2018

George Iftner
Herrera Environmental Consultants, Inc.
2200 6th Avenue, Suite 1100
Seattle, WA 98121

Re: Analytical Data for Project 14-05806-000
Laboratory Reference No. 1801-229

Dear George:

Enclosed are the analytical results and associated quality control data for samples submitted on January 23, 2018.

The standard policy of OnSite Environmental, Inc. is to store your samples for 30 days from the date of receipt. If you require longer storage, please contact the laboratory.

We appreciate the opportunity to be of service to you on this project. If you have any questions concerning the data, or need additional information, please feel free to call me.

Sincerely,

A handwritten signature in black ink, appearing to read "Blair Goodrow", enclosed within a large, loopy, circular scribble.

Blair Goodrow
Project Manager

Enclosures



OnSite Environmental, Inc. 14648 NE 95th Street, Redmond, WA 98052 (425) 883-3881

This report pertains to the samples analyzed in accordance with the chain of custody, and is intended only for the use of the individual or company to whom it is addressed.

Date of Report: February 14, 2018
Samples Submitted: January 23, 2018
Laboratory Reference: 1801-229
Project: 14-05806-000

Case Narrative

Samples were collected on January 23, 2018 and received by the laboratory on January 23, 2018. They were maintained at the laboratory at a temperature of 2°C to 6°C.

Please note that any and all soil sample results are reported on a dry-weight basis, unless otherwise noted below.

General QA/QC issues associated with the analytical data enclosed in this laboratory report will be indicated with a reference to a comment or explanation on the Data Qualifier page. More complex and involved QA/QC issues will be discussed in detail below.



Date of Report: February 14, 2018
 Samples Submitted: January 23, 2018
 Laboratory Reference: 1801-229
 Project: 14-05806-000

**TOTAL SUSPENDED SOLIDS
SM 2540D**

Matrix: Water
 Units: mg/L

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|------------------------|----------------------|-----|----------|---------------|---------------|-------|
| Client ID: | COLM-20180123 | | | | | |
| Laboratory ID: | 01-229-01 | | | | | |
| Total Suspended Solids | 1.8 | 1.0 | SM 2540D | 1-24-18 | 1-25-18 | |

| | | | | | | |
|------------------------|-----------------------|-----|----------|---------|---------|--|
| Client ID: | COUMI-20180123 | | | | | |
| Laboratory ID: | 01-229-02 | | | | | |
| Total Suspended Solids | 11 | 1.0 | SM 2540D | 1-24-18 | 1-25-18 | |

| | | | | | | |
|------------------------|-----------------------|-----|----------|---------|---------|--|
| Client ID: | COUMO-20180123 | | | | | |
| Laboratory ID: | 01-229-03 | | | | | |
| Total Suspended Solids | 19 | 1.0 | SM 2540D | 1-24-18 | 1-25-18 | |

| | | | | | | |
|------------------------|-----------------------|-----|----------|---------|---------|--|
| Client ID: | EVAMS-20180123 | | | | | |
| Laboratory ID: | 01-229-04 | | | | | |
| Total Suspended Solids | 14 | 1.0 | SM 2540D | 1-24-18 | 1-25-18 | |

| | | | | | | |
|------------------------|------------------------|-----|----------|---------|---------|--|
| Client ID: | EVALSS-20180123 | | | | | |
| Laboratory ID: | 01-229-05 | | | | | |
| Total Suspended Solids | 6.0 | 1.0 | SM 2540D | 1-24-18 | 1-25-18 | |

| | | | | | | |
|------------------------|-----------------------|-----|----------|---------|---------|--|
| Client ID: | MONMN-20180123 | | | | | |
| Laboratory ID: | 01-229-06 | | | | | |
| Total Suspended Solids | 6.4 | 1.0 | SM 2540D | 1-24-18 | 1-25-18 | |

| | | | | | | |
|------------------------|-----------------------|-----|----------|---------|---------|--|
| Client ID: | MONMS-20180123 | | | | | |
| Laboratory ID: | 01-229-07 | | | | | |
| Total Suspended Solids | 5.4 | 1.0 | SM 2540D | 1-24-18 | 1-25-18 | |



Date of Report: February 14, 2018
 Samples Submitted: January 23, 2018
 Laboratory Reference: 1801-229
 Project: 14-05806-000

**TOTAL SUSPENDED SOLIDS
 SM 2540D**

Matrix: Water
 Units: mg/L

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|------------------------|----------------------|-----|----------|---------------|---------------|-------|
| Client ID: | MONM-20180123 | | | | | |
| Laboratory ID: | 01-229-08 | | | | | |
| Total Suspended Solids | 10 | 1.0 | SM 2540D | 1-24-18 | 1-25-18 | |

| | | | | | | |
|------------------------|-----------------------|-----|----------|---------|---------|--|
| Client ID: | SEIMN-20180123 | | | | | |
| Laboratory ID: | 01-229-09 | | | | | |
| Total Suspended Solids | 14 | 1.0 | SM 2540D | 1-24-18 | 1-25-18 | |

| | | | | | | |
|------------------------|-----------------------|-----|----------|---------|---------|--|
| Client ID: | SEIMS-20180123 | | | | | |
| Laboratory ID: | 01-229-10 | | | | | |
| Total Suspended Solids | 24 | 1.0 | SM 2540D | 1-24-18 | 1-25-18 | |

| | | | | | | |
|------------------------|-----------------------|-----|----------|---------|---------|--|
| Client ID: | TOSMI-20180123 | | | | | |
| Laboratory ID: | 01-229-11 | | | | | |
| Total Suspended Solids | 87 | 1.7 | SM 2540D | 1-24-18 | 1-25-18 | |

| | | | | | | |
|------------------------|-----------------------|-----|----------|---------|---------|--|
| Client ID: | TOSMO-20180123 | | | | | |
| Laboratory ID: | 01-229-12 | | | | | |
| Total Suspended Solids | 64 | 1.7 | SM 2540D | 1-24-18 | 1-25-18 | |

| | | | | | | |
|------------------------|-----------------------|-----|----------|---------|---------|--|
| Client ID: | TYLMI-20180123 | | | | | |
| Laboratory ID: | 01-229-13 | | | | | |
| Total Suspended Solids | 6.6 | 1.0 | SM 2540D | 1-24-18 | 1-25-18 | |

| | | | | | | |
|------------------------|-----------------------|-----|----------|---------|---------|--|
| Client ID: | TYLMO-20180123 | | | | | |
| Laboratory ID: | 01-229-14 | | | | | |
| Total Suspended Solids | 11 | 1.0 | SM 2540D | 1-24-18 | 1-25-18 | |



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**TOTAL SUSPENDED SOLIDS
SM 2540D**

Matrix: Water
Units: mg/L

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|------------------------|----------------------|------------|---------------|----------------------|----------------------|--------------|
| Client ID: | QA42-20180123 | | | | | |
| Laboratory ID: | 01-229-15 | | | | | |
| Total Suspended Solids | 13 | 1.0 | SM 2540D | 1-24-18 | 1-25-18 | |



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**TOTAL SUSPENDED SOLIDS
 SM 2540D
 QUALITY CONTROL**

Matrix: Water
 Units: mg/L

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|------------------------|-----------|-----|----------|---------------|---------------|-------|
| METHOD BLANK | | | | | | |
| Laboratory ID: | MB0124W2 | | | | | |
| Total Suspended Solids | ND | 1.0 | SM 2540D | 1-24-18 | 1-25-18 | |

| Analyte | Result | Spike Level | Source Result | Percent Recovery | Recovery Limits | RPD | RPD Limit | Flags |
|------------------------|-------------|-------------|---------------|------------------|-----------------|-----|-----------|-------|
| DUPLICATE | | | | | | | | |
| Laboratory ID: | 01-229-13 | | | | | | | |
| | ORIG | DUP | | | | | | |
| Total Suspended Solids | 6.60 | 6.20 | NA | NA | NA | NA | 6 | 17 |

| | | | | | | | | |
|------------------------|-------------|-----|----|----|--------|----|----|--|
| SPIKE BLANK | | | | | | | | |
| Laboratory ID: | SB0124W2 | | | | | | | |
| | SB | SB | | SB | | | | |
| Total Suspended Solids | 95.0 | 100 | NA | 95 | 76-114 | NA | NA | |



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TURBIDITY
EPA 180.1

Matrix: Water
 Units: NTU

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|-------------------|------------------------|------|-----------|---------------|---------------|-------|
| Client ID: | COLM-20180123 | | | | | |
| Laboratory ID: | 01-229-01 | | | | | |
| Turbidity | 0.48 | 0.10 | EPA 180.1 | 1-24-18 | 1-24-18 | |
| Client ID: | COUMI-20180123 | | | | | |
| Laboratory ID: | 01-229-02 | | | | | |
| Turbidity | 5.2 | 0.10 | EPA 180.1 | 1-24-18 | 1-24-18 | |
| Client ID: | COUMO-20180123 | | | | | |
| Laboratory ID: | 01-229-03 | | | | | |
| Turbidity | 10 | 0.10 | EPA 180.1 | 1-24-18 | 1-24-18 | |
| Client ID: | EVAMS-20180123 | | | | | |
| Laboratory ID: | 01-229-04 | | | | | |
| Turbidity | 2.8 | 0.10 | EPA 180.1 | 1-24-18 | 1-24-18 | |
| Client ID: | EVALSS-20180123 | | | | | |
| Laboratory ID: | 01-229-05 | | | | | |
| Turbidity | 2.4 | 0.10 | EPA 180.1 | 1-24-18 | 1-24-18 | |
| Client ID: | MONMN-20180123 | | | | | |
| Laboratory ID: | 01-229-06 | | | | | |
| Turbidity | 8.5 | 0.10 | EPA 180.1 | 1-24-18 | 1-24-18 | |
| Client ID: | MONMS-20180123 | | | | | |
| Laboratory ID: | 01-229-07 | | | | | |
| Turbidity | 2.4 | 0.10 | EPA 180.1 | 1-24-18 | 1-24-18 | |



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TURBIDITY
EPA 180.1

Matrix: Water
 Units: NTU

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|-------------------|----------------------|------|-----------|---------------|---------------|-------|
| Client ID: | MONM-20180123 | | | | | |
| Laboratory ID: | 01-229-08 | | | | | |
| Turbidity | 6.1 | 0.10 | EPA 180.1 | 1-24-18 | 1-24-18 | |

| | | | | | | |
|-------------------|-----------------------|------|-----------|---------|---------|--|
| Client ID: | SEIMN-20180123 | | | | | |
| Laboratory ID: | 01-229-09 | | | | | |
| Turbidity | 4.2 | 0.10 | EPA 180.1 | 1-24-18 | 1-24-18 | |

| | | | | | | |
|-------------------|-----------------------|------|-----------|---------|---------|--|
| Client ID: | SEIMS-20180123 | | | | | |
| Laboratory ID: | 01-229-10 | | | | | |
| Turbidity | 3.2 | 0.10 | EPA 180.1 | 1-24-18 | 1-24-18 | |

| | | | | | | |
|-------------------|-----------------------|------|-----------|---------|---------|--|
| Client ID: | TOSMI-20180123 | | | | | |
| Laboratory ID: | 01-229-11 | | | | | |
| Turbidity | 21 | 0.10 | EPA 180.1 | 1-24-18 | 1-24-18 | |

| | | | | | | |
|-------------------|-----------------------|------|-----------|---------|---------|--|
| Client ID: | TOSMO-20180123 | | | | | |
| Laboratory ID: | 01-229-12 | | | | | |
| Turbidity | 12 | 0.10 | EPA 180.1 | 1-24-18 | 1-24-18 | |

| | | | | | | |
|-------------------|-----------------------|------|-----------|---------|---------|--|
| Client ID: | TYLMI-20180123 | | | | | |
| Laboratory ID: | 01-229-13 | | | | | |
| Turbidity | 5.0 | 0.10 | EPA 180.1 | 1-24-18 | 1-24-18 | |

| | | | | | | |
|-------------------|-----------------------|------|-----------|---------|---------|--|
| Client ID: | TYLMO-20180123 | | | | | |
| Laboratory ID: | 01-229-14 | | | | | |
| Turbidity | 5.0 | 0.10 | EPA 180.1 | 1-24-18 | 1-24-18 | |



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TURBIDITY
EPA 180.1

Matrix: Water
Units: NTU

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|-------------------|----------------------|------------|---------------|----------------------|----------------------|--------------|
| Client ID: | QA42-20180123 | | | | | |
| Laboratory ID: | 01-229-15 | | | | | |
| Turbidity | 4.8 | 0.10 | EPA 180.1 | 1-24-18 | 1-24-18 | |



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**TURBIDITY
 EPA 180.1
 QUALITY CONTROL**

Matrix: Water
 Units: NTU

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|---------------------|-----------|------|-----------|---------------|---------------|-------|
| METHOD BLANK | | | | | | |
| Laboratory ID: | MB0124W1 | | | | | |
| Turbidity | ND | 0.10 | EPA 180.1 | 1-24-18 | 1-24-18 | |

| Analyte | Result | Spike Level | Source Result | Percent Recovery | Recovery Limits | RPD | RPD Limit | Flags |
|------------------|-------------|-------------|---------------|------------------|-----------------|-----|-----------|-------|
| DUPLICATE | | | | | | | | |
| Laboratory ID: | 01-236-01 | | | | | | | |
| | ORIG | DUP | | | | | | |
| Turbidity | 11.4 | 11.5 | NA | NA | NA | NA | 1 | 15 |



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HARDNESS
EPA 200.7/SM 2340B

Matrix: Water
 Units: mg eqt. CaCO₃/L (ppm)

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|-------------------|----------------------|-----|----------------|---------------|---------------|-------|
| Client ID: | COLM-20180123 | | | | | |
| Laboratory ID: | 01-229-01 | | | | | |
| Hardness | 7.8 | 1.0 | 200.7/SM 2340B | 1-29-18 | 1-29-18 | |

| | | | | | | |
|-------------------|-----------------------|-----|----------------|---------|---------|--|
| Client ID: | COUMI-20180123 | | | | | |
| Laboratory ID: | 01-229-02 | | | | | |
| Hardness | 79 | 1.0 | 200.7/SM 2340B | 1-29-18 | 1-29-18 | |

| | | | | | | |
|-------------------|-----------------------|-----|----------------|---------|---------|--|
| Client ID: | COUMO-20180123 | | | | | |
| Laboratory ID: | 01-229-03 | | | | | |
| Hardness | 67 | 1.0 | 200.7/SM 2340B | 1-29-18 | 1-29-18 | |

| | | | | | | |
|-------------------|-----------------------|-----|----------------|---------|---------|--|
| Client ID: | EVAMS-20180123 | | | | | |
| Laboratory ID: | 01-229-04 | | | | | |
| Hardness | 74 | 1.0 | 200.7/SM 2340B | 1-29-18 | 1-29-18 | |

| | | | | | | |
|-------------------|------------------------|-----|----------------|---------|---------|--|
| Client ID: | EVALSS-20180123 | | | | | |
| Laboratory ID: | 01-229-05 | | | | | |
| Hardness | 70 | 1.0 | 200.7/SM 2340B | 1-29-18 | 1-29-18 | |

| | | | | | | |
|-------------------|-----------------------|-----|----------------|---------|---------|--|
| Client ID: | MONMN-20180123 | | | | | |
| Laboratory ID: | 01-229-06 | | | | | |
| Hardness | 47 | 1.0 | 200.7/SM 2340B | 1-29-18 | 1-29-18 | |

| | | | | | | |
|-------------------|-----------------------|-----|----------------|---------|---------|--|
| Client ID: | MONMS-20180123 | | | | | |
| Laboratory ID: | 01-229-07 | | | | | |
| Hardness | 97 | 1.0 | 200.7/SM 2340B | 1-29-18 | 1-29-18 | |



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HARDNESS
EPA 200.7/SM 2340B

Matrix: Water
 Units: mg eqt. CaCO₃/L (ppm)

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|-------------------|----------------------|-----|----------------|---------------|---------------|-------|
| Client ID: | MONM-20180123 | | | | | |
| Laboratory ID: | 01-229-08 | | | | | |
| Hardness | 62 | 1.0 | 200.7/SM 2340B | 1-29-18 | 1-29-18 | |

| | | | | | | |
|-------------------|-----------------------|-----|----------------|---------|---------|--|
| Client ID: | SEIMN-20180123 | | | | | |
| Laboratory ID: | 01-229-09 | | | | | |
| Hardness | 19 | 1.0 | 200.7/SM 2340B | 1-29-18 | 1-29-18 | |

| | | | | | | |
|-------------------|-----------------------|-----|----------------|---------|---------|--|
| Client ID: | SEIMS-20180123 | | | | | |
| Laboratory ID: | 01-229-10 | | | | | |
| Hardness | 36 | 1.0 | 200.7/SM 2340B | 1-29-18 | 1-29-18 | |

| | | | | | | |
|-------------------|-----------------------|-----|----------------|---------|---------|--|
| Client ID: | TOSMI-20180123 | | | | | |
| Laboratory ID: | 01-229-11 | | | | | |
| Hardness | 77 | 1.0 | 200.7/SM 2340B | 1-29-18 | 1-29-18 | |

| | | | | | | |
|-------------------|-----------------------|-----|----------------|---------|---------|--|
| Client ID: | TOSMO-20180123 | | | | | |
| Laboratory ID: | 01-229-12 | | | | | |
| Hardness | 75 | 1.0 | 200.7/SM 2340B | 1-29-18 | 1-29-18 | |

| | | | | | | |
|-------------------|-----------------------|-----|----------------|---------|---------|--|
| Client ID: | TYLMI-20180123 | | | | | |
| Laboratory ID: | 01-229-13 | | | | | |
| Hardness | 58 | 1.0 | 200.7/SM 2340B | 1-29-18 | 1-29-18 | |

| | | | | | | |
|-------------------|-----------------------|-----|----------------|---------|---------|--|
| Client ID: | TYLMO-20180123 | | | | | |
| Laboratory ID: | 01-229-14 | | | | | |
| Hardness | 39 | 1.0 | 200.7/SM 2340B | 1-29-18 | 1-29-18 | |



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HARDNESS
EPA 200.7/SM 2340B

Matrix: Water
Units: mg eqt. CaCO₃/L (ppm)

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|-------------------|----------------------|------------|----------------|----------------------|----------------------|--------------|
| Client ID: | QA42-20180123 | | | | | |
| Laboratory ID: | 01-229-15 | | | | | |
| Hardness | 19 | 1.0 | 200.7/SM 2340B | 1-29-18 | 1-29-18 | |



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HARDNESS
EPA 200.7/SM 2340B
QUALITY CONTROL

Matrix: Water
 Units: mg eqt. CaCO₃/L (ppm)

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|---------------------|-----------|-----|----------------|---------------|---------------|-------|
| METHOD BLANK | | | | | | |
| Laboratory ID: | MB0129WH1 | | | | | |
| Hardness | ND | 1.0 | 200.7/SM 2340B | 1-29-18 | 1-29-18 | |

| Analyte | Result | Spike Level | Source Result | Percent Recovery | Recovery Limits | RPD | RPD Limit | Flags |
|------------------|-------------|-------------|---------------|------------------|-----------------|-----|-----------|-------|
| DUPLICATE | | | | | | | | |
| Laboratory ID: | 01-229-01 | | | | | | | |
| | ORIG | DUP | | | | | | |
| Hardness | 7.76 | 7.79 | NA | NA | NA | 0 | 20 | |

| Analyte | Result | Spike Level | Source Result | Percent Recovery | Recovery Limits | RPD | RPD Limit | Flags | | |
|----------------------|------------|-------------|---------------|------------------|-----------------|-----|-----------|--------|---|----|
| MATRIX SPIKES | | | | | | | | | | |
| Laboratory ID: | 01-229-01 | | | | | | | | | |
| | MS | MSD | MS | MSD | MS | MSD | | | | |
| Hardness | 142 | 140 | 132 | 132 | 7.76 | 102 | 100 | 75-125 | 1 | 20 |

| Analyte | Result | Spike Level | Source Result | Percent Recovery | Recovery Limits | RPD | RPD Limit | Flags |
|--------------------|------------|-------------|---------------|------------------|-----------------|-----|-----------|-------|
| SPIKE BLANK | | | | | | | | |
| Laboratory ID: | SB0129WH1 | | | | | | | |
| | SB | SB | | | SB | | | |
| Hardness | 136 | 132 | NA | 103 | 80-120 | NA | NA | |



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**DISSOLVED ORGANIC CARBON
 SM 5310B**

Matrix: Water
 Units: mg/L

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|--------------------------|------------------------|-----|----------|---------------|---------------|-------|
| Client ID: | COLM-20180123 | | | | | |
| Laboratory ID: | 01-229-01 | | | | | |
| Dissolved Organic Carbon | 10 | 1.0 | SM 5310B | 1-25-18 | 1-25-18 | |
| Client ID: | COUMI-20180123 | | | | | |
| Laboratory ID: | 01-229-02 | | | | | |
| Dissolved Organic Carbon | 3.8 | 1.0 | SM 5310B | 1-25-18 | 1-25-18 | |
| Client ID: | COUMO-20180123 | | | | | |
| Laboratory ID: | 01-229-03 | | | | | |
| Dissolved Organic Carbon | 4.0 | 1.0 | SM 5310B | 1-25-18 | 1-25-18 | |
| Client ID: | EVAMS-20180123 | | | | | |
| Laboratory ID: | 01-229-04 | | | | | |
| Dissolved Organic Carbon | 4.4 | 1.0 | SM 5310B | 1-25-18 | 1-25-18 | |
| Client ID: | EVALSS-20180123 | | | | | |
| Laboratory ID: | 01-229-05 | | | | | |
| Dissolved Organic Carbon | 4.5 | 1.0 | SM 5310B | 1-25-18 | 1-25-18 | |
| Client ID: | MONMN-20180123 | | | | | |
| Laboratory ID: | 01-229-06 | | | | | |
| Dissolved Organic Carbon | 4.7 | 1.0 | SM 5310B | 1-25-18 | 1-25-18 | |
| Client ID: | MONMS-20180123 | | | | | |
| Laboratory ID: | 01-229-07 | | | | | |
| Dissolved Organic Carbon | 5.1 | 1.0 | SM 5310B | 1-25-18 | 1-25-18 | |



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**DISSOLVED ORGANIC CARBON
 SM 5310B**

Matrix: Water
 Units: mg/L

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|--------------------------|-----------------------|-----|----------|---------------|---------------|-------|
| Client ID: | MONM-20180123 | | | | | |
| Laboratory ID: | 01-229-08 | | | | | |
| Dissolved Organic Carbon | 4.8 | 1.0 | SM 5310B | 1-25-18 | 1-25-18 | |
| Client ID: | SEIMN-20180123 | | | | | |
| Laboratory ID: | 01-229-09 | | | | | |
| Dissolved Organic Carbon | 7.2 | 1.0 | SM 5310B | 1-25-18 | 1-25-18 | |
| Client ID: | SEIMS-20180123 | | | | | |
| Laboratory ID: | 01-229-10 | | | | | |
| Dissolved Organic Carbon | 5.6 | 1.0 | SM 5310B | 1-25-18 | 1-25-18 | |
| Client ID: | TOSMI-20180123 | | | | | |
| Laboratory ID: | 01-229-11 | | | | | |
| Dissolved Organic Carbon | 4.4 | 1.0 | SM 5310B | 1-25-18 | 1-25-18 | |
| Client ID: | TOSMO-20180123 | | | | | |
| Laboratory ID: | 01-229-12 | | | | | |
| Dissolved Organic Carbon | 4.6 | 1.0 | SM 5310B | 1-25-18 | 1-25-18 | |
| Client ID: | TYLMI-20180123 | | | | | |
| Laboratory ID: | 01-229-13 | | | | | |
| Dissolved Organic Carbon | 6.2 | 1.0 | SM 5310B | 1-25-18 | 1-25-18 | |
| Client ID: | TYLMO-20180123 | | | | | |
| Laboratory ID: | 01-229-14 | | | | | |
| Dissolved Organic Carbon | 3.7 | 1.0 | SM 5310B | 1-25-18 | 1-25-18 | |



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**DISSOLVED ORGANIC CARBON
SM 5310B**

Matrix: Water
Units: mg/L

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|--------------------------|----------------------|------------|---------------|----------------------|----------------------|--------------|
| Client ID: | QA42-20180123 | | | | | |
| Laboratory ID: | 01-229-15 | | | | | |
| Dissolved Organic Carbon | 7.3 | 1.0 | SM 5310B | 1-25-18 | 1-25-18 | |



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**DISSOLVED ORGANIC CARBON
 SM 5310B
 QUALITY CONTROL**

Matrix: Water
 Units: mg/L

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|--------------------------|-----------|-----|----------|---------------|---------------|-------|
| METHOD BLANK | | | | | | |
| Laboratory ID: | MB0125D2 | | | | | |
| Dissolved Organic Carbon | ND | 1.0 | SM 5310B | 1-25-18 | 1-25-18 | |

| Analyte | Result | Spike Level | Source Result | Percent Recovery | Recovery Limits | RPD | RPD Limit | Flags |
|--------------------------|-------------|-------------|---------------|------------------|-----------------|-----|-----------|-------|
| DUPLICATE | | | | | | | | |
| Laboratory ID: | 01-229-01 | | | | | | | |
| | ORIG | DUP | | | | | | |
| Dissolved Organic Carbon | 10.1 | 10.0 | NA | NA | NA | 1 | 15 | |

MATRIX SPIKE

| | | | | | | | | |
|--------------------------|-------------|------|------|----|--------|----|----|--|
| Laboratory ID: | 01-229-01 | | | | | | | |
| | MS | MS | | MS | | | | |
| Dissolved Organic Carbon | 19.0 | 10.0 | 10.1 | 89 | 75-125 | NA | NA | |

SPIKE BLANK

| | | | | | | | | |
|--------------------------|-------------|------|----|-----|--------|----|----|--|
| Laboratory ID: | SB0125D2 | | | | | | | |
| | SB | SB | | SB | | | | |
| Dissolved Organic Carbon | 9.95 | 10.0 | NA | 100 | 80-120 | NA | NA | |



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TOTAL PHOSPHORUS
EPA 365.1

Matrix: Water
 Units: mg/L

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|-------------------|----------------------|-------|-----------|---------------|---------------|-------|
| Client ID: | COLM-20180123 | | | | | |
| Laboratory ID: | 01-229-01 | | | | | |
| Total Phosphorus | ND | 0.010 | EPA 365.1 | 1-26-18 | 1-26-18 | |

| | | | | | | |
|-------------------|-----------------------|-------|-----------|---------|---------|--|
| Client ID: | COUMI-20180123 | | | | | |
| Laboratory ID: | 01-229-02 | | | | | |
| Total Phosphorus | 0.038 | 0.010 | EPA 365.1 | 1-26-18 | 1-26-18 | |

| | | | | | | |
|-------------------|-----------------------|-------|-----------|---------|---------|--|
| Client ID: | COUMO-20180123 | | | | | |
| Laboratory ID: | 01-229-03 | | | | | |
| Total Phosphorus | 0.039 | 0.010 | EPA 365.1 | 1-26-18 | 1-26-18 | |

| | | | | | | |
|-------------------|-----------------------|-------|-----------|---------|---------|--|
| Client ID: | EVAMS-20180123 | | | | | |
| Laboratory ID: | 01-229-04 | | | | | |
| Total Phosphorus | ND | 0.010 | EPA 365.1 | 1-26-18 | 1-26-18 | |

| | | | | | | |
|-------------------|------------------------|-------|-----------|---------|---------|--|
| Client ID: | EVALSS-20180123 | | | | | |
| Laboratory ID: | 01-229-05 | | | | | |
| Total Phosphorus | ND | 0.010 | EPA 365.1 | 1-26-18 | 1-26-18 | |

| | | | | | | |
|-------------------|-----------------------|-------|-----------|---------|---------|--|
| Client ID: | MONMN-20180123 | | | | | |
| Laboratory ID: | 01-229-06 | | | | | |
| Total Phosphorus | 0.014 | 0.010 | EPA 365.1 | 1-26-18 | 1-26-18 | |

| | | | | | | |
|-------------------|-----------------------|-------|-----------|---------|---------|--|
| Client ID: | MONMS-20180123 | | | | | |
| Laboratory ID: | 01-229-07 | | | | | |
| Total Phosphorus | 0.017 | 0.010 | EPA 365.1 | 1-26-18 | 1-26-18 | |



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TOTAL PHOSPHORUS
EPA 365.1

Matrix: Water
 Units: mg/L

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|-------------------|----------------------|-------|-----------|---------------|---------------|-------|
| Client ID: | MONM-20180123 | | | | | |
| Laboratory ID: | 01-229-08 | | | | | |
| Total Phosphorus | 0.017 | 0.010 | EPA 365.1 | 1-26-18 | 1-26-18 | |

| | | | | | | |
|-------------------|-----------------------|-------|-----------|---------|---------|--|
| Client ID: | SEIMN-20180123 | | | | | |
| Laboratory ID: | 01-229-09 | | | | | |
| Total Phosphorus | 0.014 | 0.010 | EPA 365.1 | 1-26-18 | 1-26-18 | |

| | | | | | | |
|-------------------|-----------------------|-------|-----------|---------|---------|--|
| Client ID: | SEIMS-20180123 | | | | | |
| Laboratory ID: | 01-229-10 | | | | | |
| Total Phosphorus | 0.038 | 0.010 | EPA 365.1 | 1-26-18 | 1-26-18 | |

| | | | | | | |
|-------------------|-----------------------|-------|-----------|---------|---------|--|
| Client ID: | TOSMI-20180123 | | | | | |
| Laboratory ID: | 01-229-11 | | | | | |
| Total Phosphorus | 0.15 | 0.010 | EPA 365.1 | 1-26-18 | 1-26-18 | |

| | | | | | | |
|-------------------|-----------------------|-------|-----------|---------|---------|--|
| Client ID: | TOSMO-20180123 | | | | | |
| Laboratory ID: | 01-229-12 | | | | | |
| Total Phosphorus | 0.080 | 0.010 | EPA 365.1 | 1-26-18 | 1-26-18 | |

| | | | | | | |
|-------------------|-----------------------|-------|-----------|---------|---------|--|
| Client ID: | TYLMI-20180123 | | | | | |
| Laboratory ID: | 01-229-13 | | | | | |
| Total Phosphorus | 0.020 | 0.010 | EPA 365.1 | 1-26-18 | 1-26-18 | |

| | | | | | | |
|-------------------|-----------------------|-------|-----------|---------|---------|--|
| Client ID: | TYLMO-20180123 | | | | | |
| Laboratory ID: | 01-229-14 | | | | | |
| Total Phosphorus | 0.024 | 0.010 | EPA 365.1 | 1-26-18 | 1-26-18 | |



Date of Report: February 14, 2018
Samples Submitted: January 23, 2018
Laboratory Reference: 1801-229
Project: 14-05806-000

TOTAL PHOSPHORUS
EPA 365.1

Matrix: Water
Units: mg/L

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|-------------------|----------------------|------------|---------------|----------------------|----------------------|--------------|
| Client ID: | QA42-20180123 | | | | | |
| Laboratory ID: | 01-229-15 | | | | | |
| Total Phosphorus | 0.013 | 0.010 | EPA 365.1 | 1-26-18 | 1-26-18 | |



Date of Report: February 14, 2018
 Samples Submitted: January 23, 2018
 Laboratory Reference: 1801-229
 Project: 14-05806-000

**TOTAL PHOSPHORUS
 EPA 365.1
 QUALITY CONTROL**

Matrix: Water
 Units: mg/L

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|---------------------|-----------|-------|-----------|---------------|---------------|-------|
| METHOD BLANK | | | | | | |
| Laboratory ID: | MB0126W2 | | | | | |
| Total Phosphorus | ND | 0.010 | EPA 365.1 | 1-26-18 | 1-26-18 | |

| Analyte | Result | Spike Level | Source Result | Percent Recovery | Recovery Limits | RPD | RPD Limit | Flags |
|------------------|-----------|-------------|---------------|------------------|-----------------|-----|-----------|-------|
| DUPLICATE | | | | | | | | |
| Laboratory ID: | 01-229-01 | | | | | | | |
| | ORIG | DUP | | | | | | |
| Total Phosphorus | ND | ND | NA | NA | NA | NA | 11 | |

| | | | | | | | | |
|---------------------|--------------|-------|----|----|--------|----|----|--|
| MATRIX SPIKE | | | | | | | | |
| Laboratory ID: | 01-229-01 | | | | | | | |
| | MS | MS | | MS | | | | |
| Total Phosphorus | 0.235 | 0.250 | ND | 94 | 82-124 | NA | NA | |

| | | | | | | | | |
|--------------------|--------------|-------|----|-----|--------|----|----|--|
| SPIKE BLANK | | | | | | | | |
| Laboratory ID: | SB0126W2 | | | | | | | |
| | SB | SB | | SB | | | | |
| Total Phosphorus | 0.252 | 0.250 | NA | 101 | 87-114 | NA | NA | |



Date of Report: February 14, 2018
 Samples Submitted: January 23, 2018
 Laboratory Reference: 1801-229
 Project: 14-05806-000

TOTAL METALS
EPA 200.8

Matrix: Water
 Units: ug/L (ppb)

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|-------------------|----------------------|-----|-----------|---------------|---------------|-------|
| Client ID: | COLM-20180123 | | | | | |
| Laboratory ID: | 01-229-01 | | | | | |
| Copper | ND | 1.0 | EPA 200.8 | 2-5-18 | 2-6-18 | |
| Zinc | ND | 5.0 | EPA 200.8 | 2-5-18 | 2-6-18 | |

| | | | | | | |
|-------------------|-----------------------|-----|-----------|--------|--------|--|
| Client ID: | COUMI-20180123 | | | | | |
| Laboratory ID: | 01-229-02 | | | | | |
| Copper | 1.7 | 1.0 | EPA 200.8 | 2-5-18 | 2-6-18 | |
| Zinc | 7.3 | 5.0 | EPA 200.8 | 2-5-18 | 2-6-18 | |

| | | | | | | |
|-------------------|-----------------------|-----|-----------|--------|--------|--|
| Client ID: | COUMO-20180123 | | | | | |
| Laboratory ID: | 01-229-03 | | | | | |
| Copper | 4.1 | 1.0 | EPA 200.8 | 2-5-18 | 2-6-18 | |
| Zinc | 19 | 5.0 | EPA 200.8 | 2-5-18 | 2-6-18 | |

| | | | | | | |
|-------------------|-----------------------|-----|-----------|--------|--------|--|
| Client ID: | EVAMS-20180123 | | | | | |
| Laboratory ID: | 01-229-04 | | | | | |
| Copper | ND | 1.0 | EPA 200.8 | 2-5-18 | 2-6-18 | |
| Zinc | ND | 5.0 | EPA 200.8 | 2-5-18 | 2-6-18 | |

| | | | | | | |
|-------------------|------------------------|-----|-----------|--------|--------|--|
| Client ID: | EVALSS-20180123 | | | | | |
| Laboratory ID: | 01-229-05 | | | | | |
| Copper | ND | 1.0 | EPA 200.8 | 2-5-18 | 2-6-18 | |
| Zinc | ND | 5.0 | EPA 200.8 | 2-5-18 | 2-6-18 | |

| | | | | | | |
|-------------------|-----------------------|-----|-----------|--------|--------|--|
| Client ID: | MONMN-20180123 | | | | | |
| Laboratory ID: | 01-229-06 | | | | | |
| Copper | 1.9 | 1.0 | EPA 200.8 | 2-5-18 | 2-6-18 | |
| Zinc | ND | 5.0 | EPA 200.8 | 2-5-18 | 2-6-18 | |

| | | | | | | |
|-------------------|-----------------------|-----|-----------|--------|--------|--|
| Client ID: | MONMS-20180123 | | | | | |
| Laboratory ID: | 01-229-07 | | | | | |
| Copper | 1.4 | 1.0 | EPA 200.8 | 2-5-18 | 2-6-18 | |
| Zinc | ND | 5.0 | EPA 200.8 | 2-5-18 | 2-6-18 | |



Date of Report: February 14, 2018
 Samples Submitted: January 23, 2018
 Laboratory Reference: 1801-229
 Project: 14-05806-000

TOTAL METALS
EPA 200.8

Matrix: Water
 Units: ug/L (ppb)

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|-------------------|----------------------|-----|-----------|---------------|---------------|-------|
| Client ID: | MONM-20180123 | | | | | |
| Laboratory ID: | 01-229-08 | | | | | |
| Copper | 1.8 | 1.0 | EPA 200.8 | 2-5-18 | 2-6-18 | |
| Zinc | 12 | 5.0 | EPA 200.8 | 2-5-18 | 2-6-18 | |

| | | | | | | |
|-------------------|-----------------------|-----|-----------|--------|--------|--|
| Client ID: | SEIMN-20180123 | | | | | |
| Laboratory ID: | 01-229-09 | | | | | |
| Copper | 1.2 | 1.0 | EPA 200.8 | 2-5-18 | 2-6-18 | |
| Zinc | ND | 5.0 | EPA 200.8 | 2-5-18 | 2-6-18 | |

| | | | | | | |
|-------------------|-----------------------|-----|-----------|--------|--------|--|
| Client ID: | SEIMS-20180123 | | | | | |
| Laboratory ID: | 01-229-10 | | | | | |
| Copper | 1.2 | 1.0 | EPA 200.8 | 2-5-18 | 2-6-18 | |
| Zinc | ND | 5.0 | EPA 200.8 | 2-5-18 | 2-6-18 | |

| | | | | | | |
|-------------------|-----------------------|-----|-----------|--------|--------|--|
| Client ID: | TOSMI-20180123 | | | | | |
| Laboratory ID: | 01-229-11 | | | | | |
| Copper | 9.9 | 1.0 | EPA 200.8 | 2-5-18 | 2-6-18 | |
| Zinc | 130 | 5.0 | EPA 200.8 | 2-5-18 | 2-6-18 | |

| | | | | | | |
|-------------------|-----------------------|-----|-----------|--------|--------|--|
| Client ID: | TOSMO-20180123 | | | | | |
| Laboratory ID: | 01-229-12 | | | | | |
| Copper | 7.8 | 1.0 | EPA 200.8 | 2-5-18 | 2-6-18 | |
| Zinc | 59 | 5.0 | EPA 200.8 | 2-5-18 | 2-6-18 | |

| | | | | | | |
|-------------------|-----------------------|-----|-----------|--------|--------|--|
| Client ID: | TYLMI-20180123 | | | | | |
| Laboratory ID: | 01-229-13 | | | | | |
| Copper | 2.8 | 1.0 | EPA 200.8 | 2-5-18 | 2-6-18 | |
| Zinc | 17 | 5.0 | EPA 200.8 | 2-5-18 | 2-6-18 | |

| | | | | | | |
|-------------------|-----------------------|-----|-----------|--------|--------|--|
| Client ID: | TYLMO-20180123 | | | | | |
| Laboratory ID: | 01-229-14 | | | | | |
| Copper | 3.5 | 1.0 | EPA 200.8 | 2-5-18 | 2-6-18 | |
| Zinc | 11 | 5.0 | EPA 200.8 | 2-5-18 | 2-6-18 | |



Date of Report: February 14, 2018
Samples Submitted: January 23, 2018
Laboratory Reference: 1801-229
Project: 14-05806-000

TOTAL METALS
EPA 200.8

Matrix: Water
Units: ug/L (ppb)

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|-------------------|----------------------|------------|---------------|----------------------|----------------------|--------------|
| Client ID: | QA42-20180123 | | | | | |
| Laboratory ID: | 01-229-15 | | | | | |
| Copper | ND | 1.0 | EPA 200.8 | 2-5-18 | 2-6-18 | |
| Zinc | ND | 5.0 | EPA 200.8 | 2-5-18 | 2-6-18 | |



Date of Report: February 14, 2018
 Samples Submitted: January 23, 2018
 Laboratory Reference: 1801-229
 Project: 14-05806-000

**TOTAL METALS
 EPA 200.8
 QUALITY CONTROL**

Matrix: Water
 Units: ug/L (ppb)

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|---------------------|-----------|-----|-----------|---------------|---------------|-------|
| METHOD BLANK | | | | | | |
| Laboratory ID: | MB0205WH1 | | | | | |
| Copper | ND | 1.0 | EPA 200.8 | 2-5-18 | 2-6-18 | |
| Zinc | ND | 5.0 | EPA 200.8 | 2-5-18 | 2-6-18 | |

| Analyte | Result | Spike Level | Source Result | Percent Recovery | Recovery Limits | RPD | RPD Limit | Flags |
|------------------|-----------|-------------|---------------|------------------|-----------------|-----|-----------|-------|
| DUPLICATE | | | | | | | | |
| Laboratory ID: | 01-229-02 | | | | | | | |
| | ORIG | DUP | | | | | | |
| Copper | 1.74 | 1.70 | NA | NA | NA | 2 | 20 | |
| Zinc | 7.32 | 7.58 | NA | NA | NA | 3 | 20 | |

MATRIX SPIKES

| | | | | | | | | | | |
|----------------|-----------|------|-----|-----|------|-----|----|--------|---|----|
| Laboratory ID: | 01-229-02 | | | | | | | | | |
| | MS | MSD | MS | MSD | MS | MSD | | | | |
| Copper | 96.8 | 96.4 | 100 | 100 | 1.74 | 95 | 95 | 75-125 | 0 | 20 |
| Zinc | 99.4 | 98.8 | 100 | 100 | 7.32 | 92 | 92 | 75-125 | 1 | 20 |



Date of Report: February 14, 2018
 Samples Submitted: January 23, 2018
 Laboratory Reference: 1801-229
 Project: 14-05806-000

**DISSOLVED METALS
 EPA 200.8**

Matrix: Water
 Units: ug/L (ppb)

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|-------------------|----------------------|-----|-----------|---------------|---------------|-------|
| Client ID: | COLM-20180123 | | | | | |
| Laboratory ID: | 01-229-01 | | | | | |
| Copper | ND | 1.0 | EPA 200.8 | | 2-6-18 | |
| Zinc | ND | 5.0 | EPA 200.8 | | 2-6-18 | |

| | | | | | | |
|-------------------|-----------------------|-----|-----------|--|--------|--|
| Client ID: | COUMI-20180123 | | | | | |
| Laboratory ID: | 01-229-02 | | | | | |
| Copper | 1.2 | 1.0 | EPA 200.8 | | 2-6-18 | |
| Zinc | ND | 5.0 | EPA 200.8 | | 2-6-18 | |

| | | | | | | |
|-------------------|-----------------------|-----|-----------|--|--------|--|
| Client ID: | COUMO-20180123 | | | | | |
| Laboratory ID: | 01-229-03 | | | | | |
| Copper | 2.0 | 1.0 | EPA 200.8 | | 2-6-18 | |
| Zinc | 8.7 | 5.0 | EPA 200.8 | | 2-6-18 | |

| | | | | | | |
|-------------------|-----------------------|-----|-----------|--|--------|--|
| Client ID: | EVAMS-20180123 | | | | | |
| Laboratory ID: | 01-229-04 | | | | | |
| Copper | ND | 1.0 | EPA 200.8 | | 2-6-18 | |
| Zinc | ND | 5.0 | EPA 200.8 | | 2-6-18 | |

| | | | | | | |
|-------------------|------------------------|-----|-----------|--|--------|--|
| Client ID: | EVALSS-20180123 | | | | | |
| Laboratory ID: | 01-229-05 | | | | | |
| Copper | ND | 1.0 | EPA 200.8 | | 2-6-18 | |
| Zinc | ND | 5.0 | EPA 200.8 | | 2-6-18 | |

| | | | | | | |
|-------------------|-----------------------|-----|-----------|--|--------|--|
| Client ID: | MONMN-20180123 | | | | | |
| Laboratory ID: | 01-229-06 | | | | | |
| Copper | 1.3 | 1.0 | EPA 200.8 | | 2-6-18 | |
| Zinc | ND | 5.0 | EPA 200.8 | | 2-6-18 | |

| | | | | | | |
|-------------------|-----------------------|-----|-----------|--|--------|--|
| Client ID: | MONMS-20180123 | | | | | |
| Laboratory ID: | 01-229-07 | | | | | |
| Copper | 1.1 | 1.0 | EPA 200.8 | | 2-6-18 | |
| Zinc | ND | 5.0 | EPA 200.8 | | 2-6-18 | |



Date of Report: February 14, 2018
 Samples Submitted: January 23, 2018
 Laboratory Reference: 1801-229
 Project: 14-05806-000

**DISSOLVED METALS
 EPA 200.8**

Matrix: Water
 Units: ug/L (ppb)

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|-------------------|----------------------|-----|-----------|---------------|---------------|-------|
| Client ID: | MONM-20180123 | | | | | |
| Laboratory ID: | 01-229-08 | | | | | |
| Copper | ND | 1.0 | EPA 200.8 | | 2-6-18 | |
| Zinc | 6.1 | 5.0 | EPA 200.8 | | 2-6-18 | |

| | | | | | | |
|-------------------|-----------------------|-----|-----------|--|--------|--|
| Client ID: | SEIMN-20180123 | | | | | |
| Laboratory ID: | 01-229-09 | | | | | |
| Copper | ND | 1.0 | EPA 200.8 | | 2-6-18 | |
| Zinc | ND | 5.0 | EPA 200.8 | | 2-6-18 | |

| | | | | | | |
|-------------------|-----------------------|-----|-----------|--|--------|--|
| Client ID: | SEIMS-20180123 | | | | | |
| Laboratory ID: | 01-229-10 | | | | | |
| Copper | ND | 1.0 | EPA 200.8 | | 2-6-18 | |
| Zinc | ND | 5.0 | EPA 200.8 | | 2-6-18 | |

| | | | | | | |
|-------------------|-----------------------|-----|-----------|--|--------|--|
| Client ID: | TOSMI-20180123 | | | | | |
| Laboratory ID: | 01-229-11 | | | | | |
| Copper | 2.7 | 1.0 | EPA 200.8 | | 2-6-18 | |
| Zinc | 27 | 5.0 | EPA 200.8 | | 2-6-18 | |

| | | | | | | |
|-------------------|-----------------------|-----|-----------|--|--------|--|
| Client ID: | TOSMO-20180123 | | | | | |
| Laboratory ID: | 01-229-12 | | | | | |
| Copper | 2.6 | 1.0 | EPA 200.8 | | 2-6-18 | |
| Zinc | 16 | 5.0 | EPA 200.8 | | 2-6-18 | |

| | | | | | | |
|-------------------|-----------------------|-----|-----------|--|--------|--|
| Client ID: | TYLMI-20180123 | | | | | |
| Laboratory ID: | 01-229-13 | | | | | |
| Copper | 2.0 | 1.0 | EPA 200.8 | | 2-6-18 | |
| Zinc | 13 | 5.0 | EPA 200.8 | | 2-6-18 | |

| | | | | | | |
|-------------------|-----------------------|-----|-----------|--|--------|--|
| Client ID: | TYLMO-20180123 | | | | | |
| Laboratory ID: | 01-229-14 | | | | | |
| Copper | 2.7 | 1.0 | EPA 200.8 | | 2-6-18 | |
| Zinc | 5.7 | 5.0 | EPA 200.8 | | 2-6-18 | |



Date of Report: February 14, 2018
Samples Submitted: January 23, 2018
Laboratory Reference: 1801-229
Project: 14-05806-000

DISSOLVED METALS
EPA 200.8

Matrix: Water
Units: ug/L (ppb)

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|-------------------|----------------------|------------|---------------|----------------------|----------------------|--------------|
| Client ID: | QA42-20180123 | | | | | |
| Laboratory ID: | 01-229-15 | | | | | |
| Copper | ND | 1.0 | EPA 200.8 | | 2-6-18 | |
| Zinc | ND | 5.0 | EPA 200.8 | | 2-6-18 | |



Date of Report: February 14, 2018
 Samples Submitted: January 23, 2018
 Laboratory Reference: 1801-229
 Project: 14-05806-000

**DISSOLVED METALS
 EPA 200.8
 QUALITY CONTROL**

Matrix: Water
 Units: ug/L (ppb)

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|---------------------|----------|-----|-----------|---------------|---------------|-------|
| METHOD BLANK | | | | | | |
| Laboratory ID: | MB0206D1 | | | | | |
| Copper | ND | 1.0 | EPA 200.8 | | 2-6-18 | |
| Zinc | ND | 5.0 | EPA 200.8 | | 2-6-18 | |

| Analyte | Result | | Spike Level | | Source Result | Percent Recovery | Recovery Limits | RPD | RPD Limit | Flags |
|------------------|-----------|-----|-------------|----|---------------|------------------|-----------------|-----|-----------|-------|
| DUPLICATE | | | | | | | | | | |
| Laboratory ID: | 01-229-15 | | | | | | | | | |
| | ORIG | DUP | | | | | | | | |
| Copper | ND | ND | NA | NA | | NA | NA | NA | 20 | |
| Zinc | ND | ND | NA | NA | | NA | NA | NA | 20 | |

MATRIX SPIKES

| | | | | | | | | | | |
|----------------|-----------|------|------|------|----|----|-----|--------|---|----|
| Laboratory ID: | 01-229-15 | | | | | | | | | |
| | MS | MSD | MS | MSD | | MS | MSD | | | |
| Copper | 68.2 | 70.8 | 80.0 | 80.0 | ND | 85 | 89 | 75-125 | 4 | 20 |
| Zinc | 70.0 | 68.8 | 80.0 | 80.0 | ND | 88 | 86 | 75-125 | 2 | 20 |





Data Qualifiers and Abbreviations

- A - Due to a high sample concentration, the amount spiked is insufficient for meaningful MS/MSD recovery data.
 - B - The analyte indicated was also found in the blank sample.
 - C - The duplicate RPD is outside control limits due to high result variability when analyte concentrations are within five times the quantitation limit.
 - E - The value reported exceeds the quantitation range and is an estimate.
 - F - Surrogate recovery data is not available due to the high concentration of coeluting target compounds.
 - H - The analyte indicated is a common laboratory solvent and may have been introduced during sample preparation, and be impacting the sample result.
 - I - Compound recovery is outside of the control limits.
 - J - The value reported was below the practical quantitation limit. The value is an estimate.
 - K - Sample duplicate RPD is outside control limits due to sample inhomogeneity. The sample was re-extracted and re-analyzed with similar results.
 - L - The RPD is outside of the control limits.
 - M - Hydrocarbons in the gasoline range are impacting the diesel range result.
 - M1 - Hydrocarbons in the gasoline range (toluene-naphthalene) are present in the sample.
 - N - Hydrocarbons in the lube oil range are impacting the diesel range result.
 - N1 - Hydrocarbons in diesel range are impacting lube oil range results.
 - O - Hydrocarbons indicative of heavier fuels are present in the sample and are impacting the gasoline result.
 - P - The RPD of the detected concentrations between the two columns is greater than 40.
 - Q - Surrogate recovery is outside of the control limits.
 - S - Surrogate recovery data is not available due to the necessary dilution of the sample.
 - T - The sample chromatogram is not similar to a typical _____.
 - U - The analyte was analyzed for, but was not detected above the reported sample quantitation limit.
 - U1 - The practical quantitation limit is elevated due to interferences present in the sample.
 - V - Matrix Spike/Matrix Spike Duplicate recoveries are outside control limits due to matrix effects.
 - W - Matrix Spike/Matrix Spike Duplicate RPD are outside control limits due to matrix effects.
 - X - Sample extract treated with a mercury cleanup procedure.
 - X1 - Sample extract treated with a sulfuric acid/silica gel cleanup procedure.
 - Y - The calibration verification for this analyte exceeded the 20% drift specified in method 8260C, and therefore the reported result should be considered an estimate. The overall performance of the calibration verification standard met the acceptance criteria of the method.
 - Z -
- ND - Not Detected at PQL
 PQL - Practical Quantitation Limit
 RPD - Relative Percent Difference





Am Test Inc.
13600 NE 126TH PL
Suite C
Kirkland, WA 98034
(425) 885-1664

**Professional
Analytical
Services**

Feb 12 2018
On-Site Environmental
14648 NE 95th ST
Redmond, WA 98052
Attention: David Baumeister

Dear David Baumeister:

Enclosed please find the analytical data for your REDMOND PAIRED WATERSHED STUDY project.

The following is a cross correlation of client and laboratory identifications for your convenience.

| CLIENT ID | MATRIX | AMTEST ID | TEST |
|-----------------|--------|------------|------------|
| COLM-20180123 | Water | 18-A001159 | Micro, NUT |
| COUMI-20180123 | Water | 18-A001160 | Micro, NUT |
| COUMO-20180123 | Water | 18-A001161 | Micro, NUT |
| EVAMS-20180123 | Water | 18-A001162 | Micro, NUT |
| EVALSS-20180123 | Water | 18-A001163 | Micro, NUT |
| MONMN-20180123 | Water | 18-A001164 | Micro, NUT |
| MONMS-20180123 | Water | 18-A001165 | Micro, NUT |
| MONM-20180123 | Water | 18-A001166 | Micro, NUT |
| SEIMN-20180123 | Water | 18-A001167 | Micro, NUT |
| SEIMS-20180123 | Water | 18-A001168 | Micro, NUT |
| TOSMI-20180123 | Water | 18-A001169 | Micro, NUT |
| TOSMO-20180123 | Water | 18-A001170 | Micro, NUT |
| TYLMI-20180123 | Water | 18-A001171 | Micro, NUT |
| TYLMO-20180123 | Water | 18-A001172 | Micro, NUT |
| QA-40-20180123 | Water | 18-A001173 | Micro, NUT |

Your samples were received on Tuesday, January 23, 2018. At the time of receipt, the samples were logged in and properly maintained prior to the subsequent analysis.

The analytical procedures used at AmTest are well documented and are typically derived from the protocols of the EPA, USDA, FDA or the Army Corps of Engineers.

Following the analytical data you will find the Quality Control (QC) results.

Please note that the detection limits that are listed in the body of the report refer to the Practical Quantitation Limits (PQL's), as opposed to the Method Detection Limits (MDL's).

Am Test Inc.
13600 NE 126TH PL
Suite C
Kirkland, WA 98034
(425) 885-1664

**Professional
Analytical
Services**

Feb 12 2018
On-Site Environmental
continued . . .

If you should have any questions pertaining to the data package, please feel free to contact me.

Sincerely,


Aaron W. Young
Laboratory Manager

Project #: 14-05806-000
PO Number: 01-229

BACT = Bacteriological
CONV = Conventional

MET = Metals
ORG = Organics

NUT=Nutrients
DEM=Demand

MIN=Minerals

Am Test Inc.
13600 NE 126TH PL
Suite C
Kirkland, WA 98034
(425) 885-1664
www.amtestlab.com



*Professional
Analytical
Services*

ANALYSIS REPORT

On-Site Environmental
14648 NE 95th ST
Redmond, WA 98052
Attention: David Baumeister
Project Name: REDMOND PAIRED WATERSHED STUDY
Project #: 14-05806-000
PO Number: 01-229
All results reported on an as received basis.

Date Received: 01/23/18
Date Reported: 2/12/18

AMTEST Identification Number 18-A001159
Client Identification COLM-20180123
Sampling Date 01/23/18, 12:15

Results

| PARAMETER | RESULT | UNITS | Q | D.L. | METHOD | ANALYST | DATE |
|--------------------------|--------|------------|---|------|-----------|---------|----------|
| Fecal Coliform | < 5 | CFU/100 ml | | 5 | SM 9222D | JM | 01/23/18 |
| Total Nitrogen (NOX&TKN) | 0.60 | mg/l | | 0.1 | | | |
| Total Nitrogen (TKN) | 0.567 | mg/l | | 0.1 | SM4500N | JC | 02/06/18 |
| Nitrate + Nitrite | 0.034 | mg/l | | 0.01 | SM4500NO3 | JC | 02/01/18 |

AMTEST Identification Number 18-A001160
Client Identification COUMI-20180123
Sampling Date 01/23/18, 10:45

Results

| PARAMETER | RESULT | UNITS | Q | D.L. | METHOD | ANALYST | DATE |
|--------------------------|--------|------------|---|------|-----------|---------|----------|
| Fecal Coliform | 330 | CFU/100 ml | | 5 | SM 9222D | JM | 01/23/18 |
| Total Nitrogen (NOX&TKN) | 0.87 | mg/l | | 0.1 | | | |
| Total Nitrogen (TKN) | 0.521 | mg/l | | 0.1 | SM4500N | JC | 02/06/18 |
| Nitrate + Nitrite | 0.35 | mg/l | | 0.01 | SM4500NO3 | JC | 02/01/18 |

AMTEST Identification Number 18-A001161
Client Identification COUMO-20180123
Sampling Date 01/23/18, 10:35

Results

| PARAMETER | RESULT | UNITS | Q | D.L. | METHOD | ANALYST | DATE |
|--------------------------|--------|------------|---|------|-----------|---------|----------|
| Fecal Coliform | 380 | CFU/100 ml | | 5 | SM 9222D | JM | 01/23/18 |
| Total Nitrogen (NOX&TKN) | 1.07 | mg/l | | 0.1 | | | |
| Total Nitrogen (TKN) | 0.572 | mg/l | | 0.1 | SM4500N | JC | 02/06/18 |
| Nitrate + Nitrite | 0.50 | mg/l | | 0.01 | SM4500NO3 | JC | 02/01/18 |

AMTEST Identification Number 18-A001162
Client Identification EVAMS-20180123
Sampling Date 01/23/18, 11:00

Results

| PARAMETER | RESULT | UNITS | Q | D.L. | METHOD | ANALYST | DATE |
|--------------------------|--------|------------|---|------|-----------|---------|----------|
| Fecal Coliform | 10. | CFU/100 ml | | 5 | SM 9222D | JM | 01/23/18 |
| Total Nitrogen (NOX&TKN) | 2.78 | mg/l | | 0.1 | | | |
| Total Nitrogen (TKN) | 0.476 | mg/l | | 0.1 | SM4500N | JC | 02/06/18 |
| Nitrate + Nitrite | 2.3 | mg/l | | 0.01 | SM4500NO3 | JC | 02/01/18 |

AMTEST Identification Number 18-A001163
Client Identification EVALSS-20180123
Sampling Date 01/23/18, 11:20

Results

| PARAMETER | RESULT | UNITS | Q | D.L. | METHOD | ANALYST | DATE |
|--------------------------|--------|------------|---|------|-----------|---------|----------|
| Fecal Coliform | 210 | CFU/100 ml | | 5 | SM 9222D | JM | 01/23/18 |
| Total Nitrogen (NOX&TKN) | 2.40 | mg/l | | 0.1 | | | |
| Total Nitrogen (TKN) | 0.504 | mg/l | | 0.1 | SM4500N | JC | 02/06/18 |
| Nitrate + Nitrite | 1.9 | mg/l | | 0.01 | SM4500NO3 | JC | 02/01/18 |

AMTEST Identification Number 18-A001164
Client Identification MONMN-20180123
Sampling Date 01/23/18, 11:55

Results

| PARAMETER | RESULT | UNITS | Q | D.L. | METHOD | ANALYST | DATE |
|--------------------------|--------|------------|---|------|-----------|---------|----------|
| Fecal Coliform | 10. | CFU/100 ml | | 5 | SM 9222D | JM | 01/23/18 |
| Total Nitrogen (NOX&TKN) | 0.76 | mg/l | | 0.1 | | | |
| Total Nitrogen (TKN) | 0.422 | mg/l | | 0.1 | SM4500N | JC | 02/06/18 |
| Nitrate + Nitrite | 0.34 | mg/l | | 0.01 | SM4500NO3 | JC | 02/01/18 |

AMTEST Identification Number 18-A001165
Client Identification MONMS-20180123
Sampling Date 01/23/18, 12:10

Results

| PARAMETER | RESULT | UNITS | Q | D.L. | METHOD | ANALYST | DATE |
|--------------------------|--------|------------|---|------|-----------|---------|----------|
| Fecal Coliform | < 5 | CFU/100 ml | | 5 | SM 9222D | JM | 01/23/18 |
| Total Nitrogen (NOX&TKN) | 1.34 | mg/l | | 0.1 | | | |
| Total Nitrogen (TKN) | 0.474 | mg/l | | 0.1 | SM4500N | JC | 02/06/18 |
| Nitrate + Nitrite | 0.87 | mg/l | | 0.01 | SM4500NO3 | JC | 02/01/18 |

AMTEST Identification Number 18-A001166
Client Identification MONM-20180123
Sampling Date 01/23/18, 13:05

Results

| PARAMETER | RESULT | UNITS | Q | D.L. | METHOD | ANALYST | DATE |
|--------------------------|--------|------------|---|------|-----------|---------|----------|
| Fecal Coliform | 40. | CFU/100 ml | | 5 | SM 9222D | JM | 01/23/18 |
| Total Nitrogen (NOX&TKN) | 0.93 | mg/l | | 0.1 | | | |
| Total Nitrogen (TKN) | 0.464 | mg/l | | 0.1 | SM4500N | JC | 02/06/18 |
| Nitrate + Nitrite | 0.47 | mg/l | | 0.01 | SM4500NO3 | JC | 02/01/18 |

AMTEST Identification Number 18-A001167
Client Identification SEIMN-20180123
Sampling Date 01/23/18, 12:44

Results

| PARAMETER | RESULT | UNITS | Q | D.L. | METHOD | ANALYST | DATE |
|--------------------------|--------|------------|---|------|-----------|---------|----------|
| Fecal Coliform | 5. | CFU/100 ml | | 5 | SM 9222D | JM | 01/23/18 |
| Total Nitrogen (NOX&TKN) | 0.78 | mg/l | | 0.1 | | | |
| Total Nitrogen (TKN) | 0.545 | mg/l | | 0.1 | SM4500N | JC | 02/06/18 |
| Nitrate + Nitrite | 0.23 | mg/l | | 0.01 | SM4500NO3 | JC | 02/01/18 |

AMTEST Identification Number 18-A001168
Client Identification SEIMS-20180123
Sampling Date 01/23/18, 12:40

Results

| PARAMETER | RESULT | UNITS | Q | D.L. | METHOD | ANALYST | DATE |
|--------------------------|--------|------------|---|------|-----------|---------|----------|
| Fecal Coliform | 5. | CFU/100 ml | | 5 | SM 9222D | JM | 01/23/18 |
| Total Nitrogen (NOX&TKN) | 0.79 | mg/l | | 0.1 | | | |
| Total Nitrogen (TKN) | 0.583 | mg/l | | 0.1 | SM4500N | JC | 02/06/18 |
| Nitrate + Nitrite | 0.21 | mg/l | | 0.01 | SM4500NO3 | JC | 02/01/18 |

AMTEST Identification Number 18-A001169
Client Identification TOSMI-20180123
Sampling Date 01/23/18, 10:35

Results

| PARAMETER | RESULT | UNITS | Q | D.L. | METHOD | ANALYST | DATE |
|--------------------------|--------|------------|---|------|-----------|---------|----------|
| Fecal Coliform | 1100 | CFU/100 ml | | 5 | SM 9222D | JM | 01/23/18 |
| Total Nitrogen (NOX&TKN) | 1.46 | mg/l | | 0.1 | | | |
| Total Nitrogen (TKN) | 0.869 | mg/l | | 0.1 | SM4500N | JC | 02/06/18 |
| Nitrate + Nitrite | 0.59 | mg/l | | 0.01 | SM4500NO3 | JC | 02/01/18 |

AMTEST Identification Number 18-A001170
Client Identification TOSMO-20180123
Sampling Date 01/23/18, 11:05

Results

| PARAMETER | RESULT | UNITS | Q | D.L. | METHOD | ANALYST | DATE |
|--------------------------|--------|------------|---|------|-----------|---------|----------|
| Fecal Coliform | 1400 | CFU/100 ml | | 5 | SM 9222D | JM | 01/23/18 |
| Total Nitrogen (NOX&TKN) | 1.29 | mg/l | | 0.1 | | | |
| Total Nitrogen (TKN) | 0.690 | mg/l | | 0.1 | SM4500N | JC | 02/06/18 |
| Nitrate + Nitrite | 0.60 | mg/l | | 0.01 | SM4500NO3 | JC | 02/01/18 |

AMTEST Identification Number 18-A001171
Client Identification TYLMI-20180123
Sampling Date 01/23/18, 11:40

Results

| PARAMETER | RESULT | UNITS | Q | D.L. | METHOD | ANALYST | DATE |
|--------------------------|--------|------------|---|------|-----------|---------|----------|
| Fecal Coliform | 440 | CFU/100 ml | | 5 | SM 9222D | JM | 01/23/18 |
| Total Nitrogen (NOX&TKN) | 1.11 | mg/l | | 0.1 | | | |
| Total Nitrogen (TKN) | 0.606 | mg/l | | 0.1 | SM4500N | JC | 02/06/18 |
| Nitrate + Nitrite | 0.50 | mg/l | | 0.01 | SM4500NO3 | JC | 02/01/18 |

AMTEST Identification Number 18-A001172
Client Identification TYLMO-20180123
Sampling Date 01/23/18, 11:25


Results

| PARAMETER | RESULT | UNITS | Q | D.L. | METHOD | ANALYST | DATE |
|--------------------------|--------|------------|---|------|-----------|---------|----------|
| Fecal Coliform | 580 | CFU/100 ml | | 5 | SM 9222D | JM | 01/23/18 |
| Total Nitrogen (NOX&TKN) | 0.81 | mg/l | | 0.1 | | | |
| Total Nitrogen (TKN) | 0.440 | mg/l | | 0.1 | SM4500N | JC | 02/06/18 |
| Nitrate + Nitrite | 0.37 | mg/l | | 0.01 | SM4500NO3 | JC | 02/01/18 |

AMTEST Identification Number 18-A001173
Client Identification QA-40-20180123
Sampling Date 01/23/18, 12:55

Results

| PARAMETER | RESULT | UNITS | Q | D.L. | METHOD | ANALYST | DATE |
|--------------------------|--------|------------|---|------|-----------|---------|----------|
| Fecal Coliform | 5. | CFU/100 ml | | 5 | SM 9222D | JM | 01/23/18 |
| Total Nitrogen (NOX&TKN) | 1.28 | mg/l | | 0.1 | | | |
| Total Nitrogen (TKN) | 0.481 | mg/l | | 0.1 | SM4500N | JC | 02/07/18 |
| Nitrate + Nitrite | 0.80 | mg/l | | 0.01 | SM4500NO3 | JC | 02/01/18 |


Aaron W. Young
Laboratory Manager

QC Summary for sample numbers: 18-A001159 to 18-A001173

DUPLICATES

| SAMPLE # | ANALYTE | UNITS | SAMPLE VALUE | DUP VALUE | RPD |
|------------|----------------------|------------|--------------|-----------|------|
| 18-A001159 | Fecal Coliform | CFU/100 ml | < 5 | 5. | |
| 18-A001173 | Fecal Coliform | CFU/100 ml | 5. | 5. | 0.00 |
| 18-A000892 | Total Nitrogen (TKN) | mg/l | 0.823 | 0.970 | 16. |
| 18-A000902 | Total Nitrogen (TKN) | mg/l | 1.40 | 1.40 | 0.00 |
| 18-A000905 | Total Nitrogen (TKN) | mg/l | 0.589 | 0.546 | 7.6 |
| 18-A001167 | Total Nitrogen (TKN) | mg/l | 0.545 | 0.481 | 12. |
| 18-A001173 | Total Nitrogen (TKN) | mg/l | 0.481 | 0.402 | 18. |
| 18-A001714 | Total Nitrogen (TKN) | mg/l | 0.462 | 0.426 | 8.1 |
| 18-A001721 | Total Nitrogen (TKN) | mg/l | 0.479 | 0.400 | 18. |
| 18-A001162 | Nitrate + Nitrite | mg/l | 2.3 | 2.2 | 4.4 |
| 18-A001172 | Nitrate + Nitrite | mg/l | 0.37 | 0.36 | 2.7 |
| 18-A001184 | Nitrate + Nitrite | mg/l | 0.35 | 0.33 | 5.9 |
| 18-A001197 | Nitrate + Nitrite | mg/l | 0.12 | 0.12 | 0.00 |
| 18-A001359 | Nitrate + Nitrite | mg/l | 0.42 | 0.41 | 2.4 |
| 18-A001369 | Nitrate + Nitrite | mg/l | 1.3 | 1.3 | 0.00 |
| 18-A001590 | Nitrate + Nitrite | mg/l | 0.47 | 0.46 | 2.2 |
| 18-A001712 | Nitrate + Nitrite | mg/l | 1.3 | 1.4 | 7.4 |
| 18-A001722 | Nitrate + Nitrite | mg/l | 0.36 | 0.36 | 0.00 |
| 18-A001770 | Nitrate + Nitrite | mg/l | 1.4 | 1.4 | 0.00 |
| 18-A001880 | Nitrate + Nitrite | mg/l | < 0.01 | < 0.01 | |
| 18-A001956 | Nitrate + Nitrite | mg/l | 39. | 43. | 9.8 |

MATRIX SPIKES

| SAMPLE # | ANALYTE | UNITS | SAMPLE VALUE | SMPL+ SPK | SPK AMT | RECOVERY |
|------------|----------------------|-------|--------------|-----------|---------|----------|
| 18-A000892 | Total Nitrogen (TKN) | mg/l | 0.823 | 2.78 | 2.00 | 97.85 % |
| 18-A000902 | Total Nitrogen (TKN) | mg/l | 1.40 | 3.40 | 2.00 | 100.00 % |
| 18-A000905 | Total Nitrogen (TKN) | mg/l | 0.589 | 2.52 | 2.00 | 96.55 % |
| 18-A001167 | Total Nitrogen (TKN) | mg/l | 0.545 | 2.57 | 2.00 | 101.25 % |
| 18-A001173 | Total Nitrogen (TKN) | mg/l | 0.481 | 2.44 | 2.00 | 97.95 % |
| 18-A001714 | Total Nitrogen (TKN) | mg/l | 0.462 | 2.41 | 2.00 | 97.40 % |
| 18-A001721 | Total Nitrogen (TKN) | mg/l | 0.479 | 2.36 | 2.00 | 94.05 % |
| 18-A001162 | Nitrate + Nitrite | mg/l | 2.3 | 8.5 | 5.0 | 124.00 % |
| 18-A001172 | Nitrate + Nitrite | mg/l | 0.37 | 1.5 | 1.0 | 113.00 % |
| 18-A001184 | Nitrate + Nitrite | mg/l | 0.35 | 1.5 | 1.0 | 115.00 % |
| 18-A001197 | Nitrate + Nitrite | mg/l | 0.12 | 1.3 | 1.0 | 118.00 % |
| 18-A001359 | Nitrate + Nitrite | mg/l | 0.42 | 1.5 | 1.0 | 108.00 % |
| 18-A001369 | Nitrate + Nitrite | mg/l | 1.3 | 2.2 | 1.0 | 90.00 % |
| 18-A001590 | Nitrate + Nitrite | mg/l | 0.47 | 1.4 | 1.0 | 93.00 % |
| 18-A001712 | Nitrate + Nitrite | mg/l | 1.3 | 2.3 | 1.0 | 100.00 % |
| 18-A001722 | Nitrate + Nitrite | mg/l | 0.36 | 1.3 | 1.0 | 94.00 % |

QC Summary for sample numbers: 18-A001159 to 18-A001173...

MATRIX SPIKES continued....

| SAMPLE # | ANALYTE | UNITS | SAMPLE VALUE | SMPL+ SPK | SPK AMT | RECOVERY |
|------------|-------------------|-------|--------------|-----------|---------|----------|
| 18-A001770 | Nitrate + Nitrite | mg/l | 1.4 | 2.3 | 1.0 | 90.00 % |
| 18-A001880 | Nitrate + Nitrite | mg/l | < 0.01 | 0.96 | 1.0 | 96.00 % |
| 18-A001956 | Nitrate + Nitrite | mg/l | 39. | 57. | 20. | 90.00 % |

STANDARD REFERENCE MATERIALS

| ANALYTE | UNITS | TRUE VALUE | MEASURED VALUE | RECOVERY |
|----------------------|-------|------------|----------------|----------|
| Total Nitrogen (TKN) | mg/l | 1.00 | 1.04 | 104. % |
| Total Nitrogen (TKN) | mg/l | 1.00 | 1.05 | 105. % |
| Total Nitrogen (TKN) | mg/l | 1.00 | 0.931 | 93.1 % |
| Total Nitrogen (TKN) | mg/l | 1.00 | 0.965 | 96.5 % |
| Nitrate + Nitrite | mg/l | 1.0 | 1.0 | 100. % |
| Nitrate + Nitrite | mg/l | 1.0 | 1.0 | 100. % |
| Nitrate + Nitrite | mg/l | 1.0 | 1.0 | 100. % |
| Nitrate + Nitrite | mg/l | 1.0 | 0.97 | 97.0 % |
| Nitrate + Nitrite | mg/l | 1.0 | 0.99 | 99.0 % |

BLANKS

| ANALYTE | UNITS | RESULT |
|----------------------|------------|--------|
| Fecal Coliform | CFU/100 ml | < 1 |
| Fecal Coliform | CFU/100 ml | < 1 |
| Total Nitrogen (TKN) | mg/l | < 0.1 |
| Total Nitrogen (TKN) | mg/l | < 0.1 |
| Total Nitrogen (TKN) | mg/l | < 0.1 |
| Total Nitrogen (TKN) | mg/l | < 0.1 |
| Nitrate + Nitrite | mg/l | < 0.01 |
| Nitrate + Nitrite | mg/l | < 0.01 |
| Nitrate + Nitrite | mg/l | < 0.01 |
| Nitrate + Nitrite | mg/l | < 0.01 |
| Nitrate + Nitrite | mg/l | < 0.01 |



14648 NE 95th Street, Redmond, WA 98052 · (425) 883-3881

Laboratory: AmTest Laboratories

Attention: Aaron Young

13600 NE 126th PI Kirkland, WA 98034

Phone Number: (425) 885-1664

Turnaround Request

1 Day 2 Day 3 Day

Standard

Other: _____

Laboratory Reference #: 01-229

Project Manager: Blair Goodrow

email: bgoodrow@onsite-env.com

Project Number: 14-05806-000

Project Name: Redmond Paired Watershed Study

| Lab ID | Sample Identification | Date Sampled | Time Sampled | Matrix | # of Cont. | Requested Analyses |
|------------------|-----------------------|--------------|--------------|---------|------------|--|
| 1 | COLM-20180123 1159 | 1/23/18 | 12:15 | Water | 2 | Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N |
| 2 | COUM-20180123 60 | 1/23/18 | 10:45 | Water | 2 | Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N |
| 3 | COUMD-20180123 61 | 1/23/18 | 10:35 | Water | 2 | Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N |
| 4 | EVAMS-20180123 62 | 1/23/18 | 11:00 | Water | 2 | Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N |
| 5 | EVALSS-20180123 63 | 1/23/18 | 11:20 | Water | 2 | Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N |
| 6 | MONMN-20180123 64 | 1/23/18 | 11:55 | Water | 2 | Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N |
| 7 | MONMS-20180123 65 | 1/23/18 | 12:10 | Water | 2 | Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N |
| 8 | MONM-20180123 66 | 1/23/18 | 13:05 | Water | 2 | Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N |
| 9 | SEIMN-20180123 67 | 1/23/18 | 12:44 | Water | 2 | Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N |
| 10 | SEIMS-20180123 68 | 1/23/18 | 12:40 | Water | 2 | Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N |
| Signature | | Company | | Date | Time | Comments/Special Instructions |
| Relinquished by: | | AMTEST | | 1/23/18 | 15:30 | |
| Received by: | | AMTEST T=7.5 | | 1/23/18 | 15:30 | |
| Relinquished by: | | | | | | |
| Received by: | | | | | | |
| Relinquished by: | | | | | | EDDs - CSV Reporting Limits: Fecal Coliform - 1.0 cfu/100ml Total Nitrogen - .10 mg/L |
| Received by: | | | | | | |



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Laboratory: AmTest Laboratories

Attention: Aaron Young

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Phone Number: (425) 885-1664

Turnaround Request
 1 Day 2 Day 3 Day
 Standard

Other: _____

Laboratory Reference #: 01-229

Project Manager: Blair Goodrow
 email: bgoodrow@onsite-env.com

Project Number: 14-05806-000

Project Name: Redmond Paired Watershed Study

| Lab ID | Sample Identification | Date Sampled | Time Sampled | Matrix | # of Cont. | Requested Analyses |
|--------|-----------------------|--------------|--------------|--------|------------|---|
| 11 | TOSMI-20180123 1169 | 1/23/18 | 10:35 | Water | 2 | Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N |
| 12 | TOSMO-20180123 70 | 1/23/18 | 11:05 | Water | 2 | Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N |
| 13 | TYLMI-20180123 71 | 1/23/18 | 11:40 | Water | 2 | Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N |
| 14 | TYLMO-20180123 72 | 1/23/18 | 11:25 | Water | 2 | Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N |
| 15 | QA-40-20180123 73 | 1/23/18 | 12:55 | Water | 2 | Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |

| Signature | Company | Date | Time | Comments/Special Instructions |
|------------------|--------------|---------|-------|--|
| Relinquished by: | OnSite Env | 1/23/18 | 15:30 | EDDs - CSV Reporting Limits: Fecal Coliform - 1.0 cfu/100ml Total Nitrogen - .10 mg/L |
| Received by: | AMTEST T-708 | 1/23/18 | 15:30 | |
| Relinquished by: | | | | |
| Received by: | | | | |
| Relinquished by: | | | | |
| Received by: | | | | |

CLIENT



14648 NE 95th Street, Redmond, WA 98052
 Telephone: 425.883.3881

Company: Herrera Environmental Consultants
 Project No.: 14-05806-000
 Project Name: Redmond Paired Watershed Study
 Project Manager: George Iftner

CHAIN OF CUSTODY

Turnaround Requested:

_____ 1 Day

_____ 2 Day

_____ 3 Day

Standard

Laboratory No. **01-229**

Requested Analyses

| | | | | | | | | | | | | | | | | | | |
|-----------------------------------|-----------------------|---------------------------------|-------------------------------------|---------------------------|------------------------------|------------------------------|-----------------------------|-----------------------------------|--|--|--|--|--|--|--|--|--|--|
| Total Suspended Solids (SM 2540D) | Turbidity (EPA 181.1) | Hardness (EPA 200.7 / SM 2340B) | Dissolved Organ Carbon (SM 5310B) * | Fecal Coliform (SM 9222D) | Total Phosphorus (EPA 365.1) | Total Nitrogen (SM 4500 N-B) | Total Cu and Zn (EPA 200.8) | Dissolved Cu and Zn (EPA 200.8) * | | | | | | | | | | |
|-----------------------------------|-----------------------|---------------------------------|-------------------------------------|---------------------------|------------------------------|------------------------------|-----------------------------|-----------------------------------|--|--|--|--|--|--|--|--|--|--|

| Lab ID | Sample Identification | Date Sampled | Time Sampled | Matrix | # of Cont. | Total Suspended Solids (SM 2540D) | Turbidity (EPA 181.1) | Hardness (EPA 200.7 / SM 2340B) | Dissolved Organ Carbon (SM 5310B) * | Fecal Coliform (SM 9222D) | Total Phosphorus (EPA 365.1) | Total Nitrogen (SM 4500 N-B) | Total Cu and Zn (EPA 200.8) | Dissolved Cu and Zn (EPA 200.8) * | | | | |
|--------|-----------------------|--------------|----------------------|--------|------------|-----------------------------------|-----------------------|---------------------------------|-------------------------------------|---------------------------|------------------------------|------------------------------|-----------------------------|-----------------------------------|--|--|--|--|
| 1 | COLM-2018 0123 | 1-23-18 | 1215 | Water | 7 | X | X | X | X | X | X | X | X | X | | | | |
| 2 | COUMI-2018 0123 | | 1045 | Water | 7 | X | X | X | X | X | X | X | X | X | | | | |
| 3 | COUMO-2018 0123 | | 1035 | Water | 7 | X | X | X | X | X | X | X | X | X | | | | |
| 4 | EVAMS-2018 0123 | | 1100 | Water | 7 | X | X | X | X | X | X | X | X | X | | | | |
| 5 | EVALSS-2018 0123 | | 1120 | Water | 7 | X | X | X | X | X | X | X | X | X | | | | |
| 6 | MONMN-2018 0123 | | 1155 | Water | 7 | X | X | X | X | X | X | X | X | X | | | | |
| 7 | MONMS-2018 0123 | | 1210 | Water | 7 | X | X | X | X | X | X | X | X | X | | | | |
| 8 | MONM-2018 0128 | | 1305 | Water | 7 | X | X | X | X | X | X | X | X | X | | | | |
| 9 | SEIMN-2018 0123 | | 1255 1255 | Water | 7 | X | X | X | X | X | X | X | X | X | | | | |
| 10 | SEIMS-2018 0123 | | 1240 | Water | 7 | X | X | X | X | X | X | X | X | X | | | | |
| 11 | TOSMI-2018 0123 | | 1035 | Water | 7 | X | X | X | X | X | X | X | X | X | | | | |
| 12 | TOSMO-2018 0123 | | 1105 | Water | 7 | X | X | X | X | X | X | X | X | X | | | | |
| 13 | TYLMI-2018 0123 | | 1140 | Water | 7 | X | X | X | X | X | X | X | X | X | | | | |
| 14 | TYLMO-2018 0123 | | 1125 | Water | 7 | X | X | X | X | X | X | X | X | X | | | | |
| 15 | QA 42-20180123 | | 1255 | Water | 7 | X | X | X | X | X | X | X | X | X | | | | |

Relinquished by [Signature] Date 1-23-18 Received by [Signature] Date 1/23/18

Firm HEC Time 1350 Firm [Signature] Time 1350

Relinquished by _____ Date _____ Received by _____ Date _____

Firm _____ Time _____ Firm _____ Time _____

Comments:
 * - field filtered with 0.45 µm filter within 15 minutes of collecting sample



14648 NE 95th Street, Redmond, WA 98052
 Telephone: 425.883.3881

Company: Herrera Environmental Consultants
 Project No.: 14-05806-000
 Project Name: Redmond Paired Watershed Study
 Project Manager: George Iltner

CHAIN OF CUSTODY

Turnaround Requested:

- 1 Day
- 2 Day
- 3 Day
- Standard

Laboratory No.

01-229

Requested Analyses

| Lab ID | Sample Identification | Date Sampled | Time Sampled | Matrix | # of Cont. | Requested Analyses | | | | | | | | | | |
|--------|-----------------------|--------------|----------------------|--------|------------|-----------------------------------|-----------------------|---------------------------------|-------------------------------------|--------------------------|------------------------------|------------------------------|-----------------------------|-----------------------------------|--|--|
| | | | | | | Total Suspended Solids (SM 2540D) | Turbidity (EPA 181.1) | Hardness (EPA 200.7 / SM 2340B) | Dissolved Organ Carbon (SM 5310B) * | Fecal Coliform (SM 922D) | Total Phosphorus (EPA 365.1) | Total Nitrogen (SM 4500 N-B) | Total Cu and Zn (EPA 200.8) | Dissolved Cu and Zn (EPA 200.8) * | | |
| 1 | COLM-2018 0123 | 1-23-18 | 1215 | Water | 7 | X | X | X | X | X | X | X | X | X | | |
| 2 | COUMI-2018 0123 | | 1045 | Water | 7 | X | X | X | X | X | X | X | X | X | | |
| 3 | COUMO-2018 0123 | | 1035 | Water | 7 | X | X | X | X | X | X | X | X | X | | |
| 4 | EVAMS-2018 0123 | | 1100 | Water | 7 | X | X | X | X | X | X | X | X | X | | |
| 5 | EVALSS-2018 0123 | | 1120 | Water | 7 | X | X | X | X | X | X | X | X | X | | |
| 6 | MONMN-2018 0123 | | 1155 | Water | 7 | X | X | X | X | X | X | X | X | X | | |
| 7 | MONMS-2018 0123 | | 1210 | Water | 7 | X | X | X | X | X | X | X | X | X | | |
| 8 | MONM-2018 0128 | | 1305 | Water | 7 | X | X | X | X | X | X | X | X | X | | |
| 9 | SEIMN-2018 0123 | | 1255 1255 | Water | 7 | X | X | X | X | X | X | X | X | X | | |
| 10 | SEIMS-2018 0123 | | 1240 | Water | 7 | X | X | X | X | X | X | X | X | X | | |
| 11 | TOSMI-2018 0123 | | 1035 | Water | 7 | X | X | X | X | X | X | X | X | X | | |
| 12 | TOSMO-2018 0123 | | 1105 | Water | 7 | X | X | X | X | X | X | X | X | X | | |
| 13 | TYLMI-2018 0123 | | 1140 | Water | 7 | X | X | X | X | X | X | X | X | X | | |
| 14 | TYLMO-2018 0123 | | 1125 | Water | 7 | X | X | X | X | X | X | X | X | X | | |
| 15 | QA42-20180123 | | 1255 | Water | 7 | X | X | X | X | X | X | X | X | X | | |

Relinquished by M. Mammuth Date 1-23-18 Received by [Signature] Date 1/23/18
 Firm HEC Time 1350 Firm ORE Time 1350
 Relinquished by _____ Date _____ Received by _____ Date _____
 Firm _____ Time _____ Firm _____ Time _____

Comments:
 * - field filtered with 0.45 µm filter within 15 minutes of collecting sample

METER CALIBRATION LOG - Redmond Paired Watershed Study



| | | | |
|-----------------------------------|-----------------|-------|-------|
| Project Number: | 14-05806-000 | | |
| Personnel Performing Calibration: | V. Wu M. Mullen | | |
| Meter: | ProDSS #1 | | |
| Date/Time: | 1-23-19 9:30 | | |
| Barometric Pressure Start of Day: | mmHg: 758.1 | Time: | 9:30 |
| Barometric Pressure End of Day: | mmHg: 755.8 | Time: | 14:40 |

| |
|---|
| Calibration Procedures: |
| Rinse Multimeter Sonde Between Each Operation |
| Rinse 3 times with tap water, 3 times with deionized water, then 3 times with the solution to be used for calibrating or testing. |
| Conductivity Calibration Notes: |

| PRE Field Run CALIBRATION | Meter Reading | Buffer / Cal Std | Temp °C | Comments |
|---------------------------|---------------|------------------|---------|--------------------|
| Conductivity (µS/cm) | 8-3 | 0 | 22.5 | Herrera DI water * |
| Conductivity (µS/cm) | 999 | 1,000 | 22.5 | |
| Conductivity (µS/cm) | 100.2 | 100 | 22.1 | |
| DO % Saturation | 100.2 | 100 | 22.0 | |

1. Dry the conductivity probe with a lab tissue (e.g., KimWipes®) and DI water.
2. Fill calibration cup to within a centimeter of the top of the calibration cup with DI water (0 µS).
3. Fill the calibration cup with 1,000 µS standard so that the temperature/conductivity probe is submerged.
4. Make sure there are no bubbles in the cell; wait 2 minutes.
5. Enter the appropriate standard value (1,000 µS/cm or 1.0 mS/cm) for Sp Cond.
6. Check conductivity using 100 µS/cm standard.

| POST Field Run CHECK | Meter Reading | Buffer / Cal Std | Temp °C | Comments |
|----------------------|---------------|------------------|---------|------------------|
| Conductivity (µS/cm) | 78 | 0 | 20.1 | Herrera DI water |
| Conductivity (µS/cm) | 102.5 | 100 | 22.2 | |
| DO % Saturation | 100.6 | 100 | 16.4 | |

- Dissolved Oxygen Calibration Notes:**
1. Fill the calibration cup with about 1/2 inch of DI; it should be below the sensor cap.
 2. Use KimWipes® to dry any droplets from the sensor cap.
 3. Invert calibration cup's cap and gently rest it on the cup.
 4. Wait 5 minutes, making sure that temperature stabilizes.
 5. Determine local barometric pressure (mm Hg) and enter this value into the meter.
 6. Click "Calibrate". "Calibrate Successful" will be displayed.
 7. To retain calibration accuracy between measurements, store with the sensor immersed in water or within a water-saturated air environment such as a sealed storage cup with at least 10 ml of water.
 8. It is important to have the water-saturated air and the sensor at the same temperature. Therefore, store a jar of DI in the same environment as the sonde and calibrate in a similar air temperature as the water and sonde.
 9. Keep probe out of direct sun or wind.

* 1st DI water read @ 15 for both meters

METER CALIBRATION LOG - Redmond Paired Watershed Study

| | | | |
|-----------------------------------|------------------|-------------|--|
| Project Number: | 14-05806-000 | | |
| Personnel Performing Calibration: | V. Wu, M. Miller | | |
| Meter: | Pro DSS #2 | | |
| Date/Time: | 1-23-18 9:30 | | |
| Barometric Pressure Start of Day: | mmHg: 758.1 | Time: 9:30 | |
| Barometric Pressure End of Day: | mmHg: 755.8 | Time: 14:40 | |

| |
|---|
| Calibration Procedures: |
| Rinse Multimetric Sonde Between Each Operation |
| Rinse 3 times with tap water, 3 times with deionized water, then 3 times with the solution to be used for calibrating or testing. |
| Conductivity Calibration Notes: |



| PRE Field Run CALIBRATION | Meter Reading | Buffer / Cal Std | Temp °C | Comments |
|---------------------------|--------------------------|------------------|---------|--------------------|
| Conductivity (µS/cm) | 8.6 | 0 | 22.7 | Herrera DI water * |
| Conductivity (µS/cm) | 100.7 1000 | 1,000 | 22.6 | calibrated |
| Conductivity (µS/cm) | 100.3 | 100 | 22.0 | |
| DO % Saturation | 98.6 | 100 | 21.7 | |

| POST Field Run CHECK | Meter Reading | Buffer / Cal Std | Temp °C | Comments |
|----------------------|---------------|------------------|---------|------------------|
| Conductivity (µS/cm) | 7.8 | 0 | 20.1 | Herrera DI Water |
| Conductivity (µS/cm) | 99.6 | 100 | 22.2 | |
| DO % Saturation | 100% | 100 | 20.3 | |

* lab DI water read @ 15 for both meters

1. Dry the conductivity probe with a lab tissue (e.g., KimWipes®) and DI water.
 2. Fill calibration cup to within a centimeter of the top of the calibration cup with DI water (0 µS).
 3. Fill the calibration cup with 1,000 µS standard so that the temperature/conductivity probe is submerged.
 4. Make sure there are no bubbles in the cell; wait 2 minutes.
 5. Enter the appropriate standard value (1,000 µS/cm or 1.0 mS/cm) for Sp Cond.
 6. Check conductivity using 100 µS/cm standard.
- Dissolved Oxygen Calibration Notes:**
1. Fill the calibration cup with about 1/2 inch of DI; it should be below the sensor cap.
 2. Use KimWipes® to dry any droplets from the sensor cap.
 3. Invert calibration cup's cap and gently rest it on the cup.
 4. Wait 5 minutes, making sure that temperature stabilizes.
 5. Determine local barometric pressure (mm Hg) and enter this value into the meter.
 6. Click "Calibrate". "Calibrate Successful" will be displayed.
 7. To retain calibration accuracy between measurements, store with the sensor immersed in water or within a water-saturated air environment such as a sealed storage cup with at least 10 ml of water.
 8. It is important to have the water-saturated air and the sensor at the same temperature. Therefore, store a jar of DI in the same environment as the sonde and calibrate in a similar air temperature as the water and sonde.
 9. Keep probe out of direct sun or wind.

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: M Muller J Gerzel
 Sample Date: 1-23-18 Sample Time: 12:15 PDT:
 Base Flow or Storm Event? Field Filtered Time: 12:20 PST:
 (Must filter within 15 minutes of collection)

SITE ID: COLM
 Project Number: 14-05806-000



Project Name: Redmond Paired Watershed Study
 Current Weather and Temp: rainy 42°

Water Quality Sampling

| Parameter | Bottle Type | Bottle Volume | # Bottles | Preservative | Duplicated? |
|---------------------------|-------------|---------------|-----------|--------------------------------|-------------|
| TSS and Turbidity | HDPE | 1L | 1 | NA | no |
| DOC * | HDPE | 250 ml | 1 | HCL | ↓ |
| Fecal Col. Bact. | HDPE | 250 ml | 1 | EDTA | |
| T. Phosphorous | HDPE | 250 ml | 1 | H ₂ SO ₄ | |
| T. Nitrogen | HDPE | 250 ml | 1 | H ₂ SO ₄ | |
| Diss. Cu and Zn * | HDPE | 250 ml | 1 | HNO ₃ | |
| Hardness, Total Cu and Zn | HDPE | 500 ml | 1 | HNO ₃ | ↓ |

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID: _____
 Filter blank sample ID: _____
 Transfer blank sample ID: _____

Visual and Olfactory Conditions:
 Clarity: clear
 Color: tanin
 Odor: none
 Sheen: none
 Floatables: foam

LABORATORY DELIVERY

Date: _____ Time: _____

Quality Assurance
 Checked By: S. Lenth Signature: [Signature]
 Date Checked: 2-10-18 Time: _____
 Data Entered into Database? YES NO initials: _____
 Date Entered: _____ Time: _____
 Notes: _____

Field Meter Calibration

Check which field meter was used and complete the meter calibration form
 YSI Pro Plus (15D100020) _____
 YSI Pro DSS 1 _____
 YSI Pro DSS 2 _____

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)
 Stream Stage (ft): 5.84
 Reference Point (description): SG

Water Quality Measurements

Temperature (°C) 5.0°
 Specific Conductivity (µs/cm) 27.4
 Dissolved Oxygen (mg/L) 11.90

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: BB VW
 Sample Date: 1-23-18 Sample Time: 10:45 PDT:
 Base Flow or Storm Event? Storm Event? Field Filtered Time: 10:50 PST:
 (Must filter within 15 minutes of collection)

SITE ID: WUM1-20180123
 Project Number: 14-05806-000



Project Name: Redmond Paired Watershed Study

Current Weather and Temp: RAIN 43°F

Water Quality Sampling

Sample ID: WUM1-20180123

| Parameter | Bottle Type | Bottle Volume | # Bottles | Preservative | Duplicated? |
|---------------------------|-------------|---------------|-----------|--------------------------------|-------------|
| TSS and Turbidity | HDPE | 1L | 1 | NA | N |
| DOC * | HDPE | 250 ml | 1 | HCL | ↓ |
| Fecal Col. Bact. | HDPE | 250 ml | 1 | EDTA | |
| T. Phosphorous | HDPE | 250 ml | 1 | H ₂ SO ₄ | |
| T. Nitrogen | HDPE | 250 ml | 1 | H ₂ SO ₄ | |
| Diss. Cu and Zn * | HDPE | 250 ml | 1 | HNO ₃ | |
| Hardness, Total Cu and Zn | HDPE | 500 ml | 1 | HNO ₃ | |

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID: _____
 Filter blank sample ID: _____
 Transfer blank sample ID: _____

Visual and Olfactory Conditions:

Clarity: Clear
 Color: None
 Odor: _____
 Sheen: _____
 Floatables: _____

LABORATORY DELIVERY

Date: _____ Time: _____

Quality Assurance

Checked By: J. Lenth Signature: [Signature]
 Date Checked: 2-16-18 Time: _____
 Data Entered into Database? YES NO initials: _____
 Date Entered: _____ Time: _____
 Notes: _____

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

YSI Pro Plus (15D100020) _____
 YSI Pro DSS 1 _____
 YSI Pro DSS 2 X

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): 2.94
 Reference Point (description): SG

Water Quality Measurements

Temperature (°C) 7.3
 Specific Conductivity (µs/cm) 167.6
 Dissolved Oxygen (mg/L) 11.73

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: BB VW
 Sample Date: 1.23.18 Sample Time: 10:35 PDT:
 Base Flow or Storm Event? Storm Event? Field Filtered Time: 10:40 PST: X
(Must filter within 15 minutes of collection)

SITE ID: COUMO
 Project Number: 14-05806-000



Project Name: Redmond Paired Watershed Study
 Current Weather and Temp: Rain 43°F

Water Quality Sampling

Sample ID: COUMO-20180123

| Parameter | Bottle Type | Bottle Volume | # Bottles | Preservative | Duplicated? |
|---------------------------|-------------|---------------|-----------|--------------------------------|-------------|
| TSS and Turbidity | HDPE | 1L | 1 | NA | N ↓ |
| DOC * | HDPE | 250 ml | 1 | HCL | |
| Fecal Col. Bact. | HDPE | 250 ml | 1 | EDTA | |
| T. Phosphorous | HDPE | 250 ml | 1 | H ₂ SO ₄ | |
| T. Nitrogen | HDPE | 250 ml | 1 | H ₂ SO ₄ | |
| Diss. Cu and Zn * | HDPE | 250 ml | 1 | HNO ₃ | |
| Hardness, Total Cu and Zn | HDPE | 500 ml | 1 | HNO ₃ | |

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID: _____
 Filter blank sample ID: _____
 Transfer blank sample ID: _____

Visual and Olfactory Conditions:

Clarity: clear
 Color: none
 Odor: _____
 Sheen: _____
 Floatables: _____

LABORATORY DELIVERY

Date: _____ Time: _____

Quality Assurance

Checked By: S. Lenth Signature: [Signature]
 Date Checked: 2-16-18 Time: _____
 Data Entered into Database? YES NO initials: _____
 Date Entered: _____ Time: _____
 Notes: _____

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

YSI Pro Plus (15D100020) _____
 YSI Pro DSS 1 _____
 YSI Pro DSS 2 X

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): 1.40
 Reference Point (description): SG

Water Quality Measurements

Temperature (°C) 7.3
 Specific Conductivity (µs/cm) 151.7
 Dissolved Oxygen (mg/L) 11.75

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: M Muller J Gogel
 Sample Date: 1-23-18 Sample Time: 11:00 PDT
 Base Flow or Storm Event? Field Filtered Time: 11:05 PST:
(Must filter within 15 minutes of collection)

SITE ID: EVANS
 Project Number: 14-05806-000



Project Name: Redmond Paired Watershed Study

Current Weather and Temp: rainy 42°

Water Quality Sampling

Sample ID: EVANS - 20160123

| Parameter | Bottle Type | Bottle Volume | # Bottles | Preservative | Duplicated? |
|---------------------------|-------------|---------------|-----------|--------------------------------|-------------|
| TSS and Turbidity | HDPE | 1L | 1 | NA | <u>No</u> |
| DOC * | HDPE | 250 ml | 1 | HCL | ↓ |
| Fecal Col. Bact. | HDPE | 250 ml | 1 | EDTA | |
| T. Phosphorous | HDPE | 250 ml | 1 | H ₂ SO ₄ | |
| T. Nitrogen | HDPE | 250 ml | 1 | H ₂ SO ₄ | |
| Diss. Cu and Zn * | HDPE | 250 ml | 1 | HNO ₃ | |
| Hardness, Total Cu and Zn | HDPE | 500 ml | 1 | HNO ₃ | |

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID: _____
 Filter blank sample ID: _____
 Transfer blank sample ID: _____

Visual and Olfactory Conditions:

Clarity: clear
 Color: none
 Odor: none
 Sheen: none
 Floatables: none

LABORATORY DELIVERY

Date: _____ Time: _____

Quality Assurance

Checked By: S. Lenth Signature: [Signature]
 Date Checked: 2-16-18 Time: _____
 Data Entered into Database? YES NO initials:
 Date Entered: _____ Time: _____
 Notes: _____

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

YSI Pro Plus (15D100020) _____
 YSI Pro DSS 1 _____
 YSI Pro DSS 2 _____

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): 3.92
 Reference Point (description): S6

Water Quality Measurements

Temperature (°C) 6.7°
 Specific Conductivity (µs/cm) 172.6
 Dissolved Oxygen (mg/L) 11.81

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: M Mullen J Gerz
 Sample Date: 1-23-18 Sample Time: 11:20 PDT:
 Base Flow or Storm Event? Field Filtered Time: 11:25 PST:
 (Must filter within 15 minutes of collection)

SITE ID: EVALSS
 Project Number: 14-05806-000



Project Name: Redmond Paired Watershed Study

Current Weather and Temp: cloudy 42°

Water Quality Sampling

Sample ID: EVALSS - 20180123

| Parameter | Bottle Type | Bottle Volume | # Bottles | Preservative | Duplicated? |
|---------------------------|-------------|---------------|-----------|--------------------------------|-------------|
| TSS and Turbidity | HDPE | 1L | 1 | NA | <u>NO</u> |
| DOC * | HDPE | 250 ml | 1 | HCL | ↓ |
| Fecal Col. Bact. | HDPE | 250 ml | 1 | EDTA | |
| T. Phosphorous | HDPE | 250 ml | 1 | H ₂ SO ₄ | |
| T. Nitrogen | HDPE | 250 ml | 1 | H ₂ SO ₄ | |
| Diss. Cu and Zn * | HDPE | 250 ml | 1 | HNO ₃ | |
| Hardness, Total Cu and Zn | HDPE | 500 ml | 1 | HNO ₃ | |

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID: _____
 Filter blank sample ID: _____
 Transfer blank sample ID: _____

Visual and Olfactory Conditions:

Clarity: clear
 Color: none
 Odor: none
 Sheen: none
 Floatables: none

LABORATORY DELIVERY

Date: _____ Time: _____

Quality Assurance

Checked By: S. Gerz Signature: _____
 Date Checked: 2-16-18 Time: _____
 Data Entered into Database? YES NO initials: _____
 Date Entered: _____ Time: _____
 Notes: _____

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

YSI Pro Plus (15D100020) _____
 YSI Pro DSS 1 _____
 YSI Pro DSS 2 _____

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): 2.34
 Reference Point (description): SL

Water Quality Measurements

Temperature (°C) 6.8°
 Specific Conductivity (µs/cm) 161.5
 Dissolved Oxygen (mg/L) 12.13

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: BB VW
 Sample Date: 1.23.18 Sample Time: 11:55 PDT:
 Base Flow or Storm Event? Field Filtered Time: 1200 PST
(Must filter within 15 minutes of collection)

SITE ID: MONMN
 Project Number: 14-05806-000



Project Name: Redmond Paired Watershed Study
 Current Weather and Temp: Rain 43°F

Water Quality Sampling

Sample ID: MONMN-20180123

| Parameter | Bottle Type | Bottle Volume | # Bottles | Preservative | Duplicated? |
|---------------------------|-------------|---------------|-----------|--------------------------------|-------------|
| TSS and Turbidity | HDPE | 1L | 1 | NA | N |
| DOC * | HDPE | 250 ml | 1 | HCL | |
| Fecal Col. Bact. | HDPE | 250 ml | 1 | EDTA | |
| T. Phosphorous | HDPE | 250 ml | 1 | H ₂ SO ₄ | |
| T. Nitrogen | HDPE | 250 ml | 1 | H ₂ SO ₄ | |
| Diss. Cu and Zn * | HDPE | 250 ml | 1 | HNO ₃ | |
| Hardness, Total Cu and Zn | HDPE | 500 ml | 1 | HNO ₃ | |

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID: _____
 Filter blank sample ID: _____
 Transfer blank sample ID: _____

Visual and Olfactory Conditions:

Clarity: clear
 Color: none
 Odor: _____
 Sheen: _____
 Floatables: _____

LABORATORY DELIVERY

Date: _____ Time: _____

Quality Assurance

Checked By: S. L. Keith Signature: _____
 Date Checked: 2-10-18 Time: _____
 Data Entered into Database? YES NO initials:
 Date Entered: _____ Time: _____
 Notes: _____

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

YSI Pro Plus (15D100020) _____
 YSI Pro DSS 1 _____
 YSI Pro DSS 2 _____

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): 9.96 35
 Reference Point (description): SG

Water Quality Measurements

Temperature (°C) 4.7
 Specific Conductivity (µs/cm) 131.0
 Dissolved Oxygen (mg/L) 11.74

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: BB VW
 Sample Date: 1.23.18 Sample Time: 1210 PDT: _____
 Base Flow or Storm Event? (Storm Event) Field Filtered Time: 1215 PST: X
(Must filter within 15 minutes of collection)

SITE ID: MONMS

Project Number: 14-05806-000



Project Name: Redmond Paired Watershed Study

Current Weather and Temp: Rain 43°F

Water Quality Sampling

Sample ID: MONMS-20180123

| Parameter | Bottle Type | Bottle Volume | # Bottles | Preservative | Duplicated? |
|---------------------------|-------------|---------------|-----------|--------------------------------|-------------|
| TSS and Turbidity | HDPE | 1L | 1 | NA | N |
| DOC * | HDPE | 250 ml | 1 | HCL | ↓ |
| Fecal Col. Bact. | HDPE | 250 ml | 1 | EDTA | |
| T. Phosphorous | HDPE | 250 ml | 1 | H ₂ SO ₄ | |
| T. Nitrogen | HDPE | 250 ml | 1 | H ₂ SO ₄ | |
| Diss. Cu and Zn * | HDPE | 250 ml | 1 | HNO ₃ | |
| Hardness, Total Cu and Zn | HDPE | 500 ml | 1 | HNO ₃ | |

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID: _____
 Filter blank sample ID: _____
 Transfer blank sample ID: _____

Visual and Olfactory Conditions:

Clarity: clear
 Color: none
 Odor: L
 Sheen: _____
 Floatables: _____

LABORATORY DELIVERY

Date: _____ Time: _____

Quality Assurance

Checked By: J. Leach Signature: _____
 Date Checked: 2-16-18 Time: _____
 Data Entered into Database? YES NO initials: _____
 Date Entered: _____ Time: _____
 Notes: _____

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

YSI Pro Plus (15D100020) _____
 YSI Pro DSS 1 _____
 YSI Pro DSS 2 X

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): 10.02
 Reference Point (description): VAULT

Water Quality Measurements

Temperature (°C) 4.8
 Specific Conductivity (µs/cm) 250.4
 Dissolved Oxygen (mg/L) 10.4

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: BB WJ
 Sample Date: 1-23-18 Sample Time: 1305 PDT:
 Base Flow or Storm Event? Field Filtered Time: 1310 PST:
(Must filter within 15 minutes of collection)

SITE ID: MONM
 Project Number: 14-05806-000



Project Name: Redmond Paired Watershed Study
 Current Weather and Temp: Rain 41°F

Water Quality Sampling

Sample ID: MONM-20180123

| Parameter | Bottle Type | Bottle Volume | # Bottles | Preservative | Duplicated? |
|---------------------------|-------------|---------------|-----------|--------------------------------|-------------------------------------|
| TSS and Turbidity | HDPE | 1L | 1 | NA | <input checked="" type="checkbox"/> |
| DOC * | HDPE | 250 ml | 1 | HCL | <input type="checkbox"/> |
| Fecal Col. Bact. | HDPE | 250 ml | 1 | EDTA | <input type="checkbox"/> |
| T. Phosphorous | HDPE | 250 ml | 1 | H ₂ SO ₄ | <input type="checkbox"/> |
| T. Nitrogen | HDPE | 250 ml | 1 | H ₂ SO ₄ | <input type="checkbox"/> |
| Diss. Cu and Zn * | HDPE | 250 ml | 1 | HNO ₃ | <input type="checkbox"/> |
| Hardness, Total Cu and Zn | HDPE | 500 ml | 1 | HNO ₃ | <input type="checkbox"/> |

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID: _____
 Filter blank sample ID: _____
 Transfer blank sample ID: _____

Visual and Olfactory Conditions:

Clarity: clear
 Color: none
 Odor: _____
 Sheen: _____
 Floatables: _____

LABORATORY DELIVERY

Date: _____ Time: _____

Quality Assurance

Checked By: S. Smith Signature: _____
 Date Checked: 2-10-18 Time: _____
 Data Entered into Database? YES NO initials: _____
 Date Entered: _____ Time: _____
 Notes: _____

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

YSI Pro Plus (15D100020) _____
 YSI Pro DSS 1 _____
 YSI Pro DSS 2 _____

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): NA
 Reference Point (description): NA

Water Quality Measurements

Temperature (°C) 10.9
 Specific Conductivity (µs/cm) 153.4
 Dissolved Oxygen (mg/L) 12.10

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: M Mullen J Goyal
 Sample Date: 1-23-18 Sample Time: 12:55 PDT:
 Base Flow or Storm Event? Field Filtered Time: 13:00 PST:
 (Must filter within 15 minutes of collection)

SITE ID: SEIMN
 Project Number: 14-05806-000



Project Name: Redmond Paired Watershed Study

Current Weather and Temp: rainy 42°

Water Quality Sampling

Sample ID: SEIMN-20180123

| Parameter | Bottle Type | Bottle Volume | # Bottles | Preservative | Duplicated? |
|---------------------------|-------------|---------------|-----------|--------------------------------|-------------|
| TSS and Turbidity | HDPE | 1L | 1 | NA | <u>Yes</u> |
| DOC * | HDPE | 250 ml | 1 | HCL | |
| Fecal Col. Bact. | HDPE | 250 ml | 1 | EDTA | |
| T. Phosphorous | HDPE | 250 ml | 1 | H ₂ SO ₄ | |
| T. Nitrogen | HDPE | 250 ml | 1 | H ₂ SO ₄ | |
| Diss. Cu and Zn * | HDPE | 250 ml | 1 | HNO ₃ | |
| Hardness, Total Cu and Zn | HDPE | 500 ml | 1 | HNO ₃ | <u>Yes</u> |

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID: QA 42 - 20180123
 Filter blank sample ID: NA
 Transfer blank sample ID: NA

Visual and Olfactory Conditions:

Clarity: very light clear
 Color: very slight yellow
 Odor: none
 Sheen: none
 Floatables: none

LABORATORY DELIVERY

Date: _____ Time: _____

Quality Assurance

Checked By: [Signature] Signature: [Signature]
 Date Checked: 2-16-18 Time: _____
 Data Entered into Database? YES NO initials: _____
 Date Entered: _____ Time: _____
 Notes: _____

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

YSI Pro Plus (15D100020) _____
 YSI Pro DSS 1 _____
 YSI Pro DSS 2 _____

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): 0.73
 Reference Point (description): top of bolt#

Water Quality Measurements

Temperature (°C) 6.2°
 Specific Conductivity (µs/cm) 50.3
 Dissolved Oxygen (mg/L) 12.28

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: BB VW
 Sample Date: 1.23.13 Sample Time: 1240 PDT:
 Base Flow or Storm Event? (circled) Field Filtered Time: 1245 PST: X
(Must filter within 15 minutes of collection)

SITE ID: SEIMS
 Project Number: 14-05806-000



Project Name: Redmond Paired Watershed Study

Current Weather and Temp: Rain 42°F

Water Quality Sampling

Sample ID: SEIMS-20180123

| Parameter | Bottle Type | Bottle Volume | # Bottles | Preservative | Duplicated? |
|---------------------------|-------------|---------------|-----------|--------------------------------|-------------|
| TSS and Turbidity | HDPE | 1L | 1 | NA | N ↓ |
| DOC * | HDPE | 250 ml | 1 | HCL | |
| Fecal Col. Bact. | HDPE | 250 ml | 1 | EDTA | |
| T. Phosphorous | HDPE | 250 ml | 1 | H ₂ SO ₄ | |
| T. Nitrogen | HDPE | 250 ml | 1 | H ₂ SO ₄ | |
| Diss. Cu and Zn * | HDPE | 250 ml | 1 | HNO ₃ | |
| Hardness, Total Cu and Zn | HDPE | 500 ml | 1 | HNO ₃ | |

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID: _____
 Filter blank sample ID: _____
 Transfer blank sample ID: _____

Visual and Olfactory Conditions:

Clarity: clear
 Color: light brown
 Odor: none
 Sheen: none
 Floatables: susp sed

LABORATORY DELIVERY

Date: _____ Time: _____

Quality Assurance

Checked By: S. Lenth Signature: _____
 Date Checked: 2.16.18 Time: _____
 Data Entered into Database? YES NO initials:
 Date Entered: _____ Time: _____
 Notes: _____

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

YSI Pro Plus (15D100020) _____
 YSI Pro DSS 1 _____
 YSI Pro DSS 2 X

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): 0.85
 Reference Point (description): SG

Water Quality Measurements

Temperature (°C) 10.4
 Specific Conductivity (µs/cm) 82.1
 Dissolved Oxygen (mg/L) 11.56

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: M. Mullen J. Geigel

SITE ID:

Sample Date: 1-23-18

Sample Time: 10:35

PDT:

Project Number: TOSMI

Base Flow or Storm Event? (circled)

Field Filtered Time: 10:40

PST: X

Project Name: Redmond Paired Watershed Study

(Must filter within 15 minutes of collection)



HERRERA

Water Quality Sampling

Sample ID: TOSMI-20180123

Current Weather and Temp: 42° rainy

| Parameter | Bottle Type | Bottle Volume | # Bottles | Preservative | Duplicated? |
|---------------------------|-------------|---------------|-----------|--------------------------------|-------------|
| TSS and Turbidity | HDPE | 1L | 1 | NA | <u>NO</u> |
| DOC * | HDPE | 250 ml | 1 | HCL | |
| Fecal Col. Bact. | HDPE | 250 ml | 1 | EDTA | |
| T. Phosphorus | HDPE | 250 ml | 1 | H ₂ SO ₄ | |
| T. Nitrogen | HDPE | 250 ml | 1 | H ₂ SO ₄ | |
| Diss. Cu and Zn * | HDPE | 250 ml | 1 | HNO ₃ | |
| Hardness, Total Cu and Zn | HDPE | 500 ml | 1 | HNO ₃ | |

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID:

Filter blank sample ID:

Transfer blank sample ID:

Visual and Olfactory Conditions:

Clarity: slightly turbid
 Color: none
 Odor: none
 Sheen: none
 Floatables: none

LABORATORY DELIVERY

Date:

Time:

Quality Assurance

Checked By: J. Geigel

Signature: [Signature]

Date Checked: 2-16-18

Time:

Data Entered into Database?

YES

NO

initials:

Date Entered:

Time:

Notes:

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

YSI Pro Plus (15D100020)

YSI Pro DSS 1

YSI Pro DSS 2

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): 0.94

Reference Point (description): SL

Water Quality Measurements

Temperature (°C): 7.3°

Specific Conductivity (µs/cm): 169.0

Dissolved Oxygen (mg/L): 11.48

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: BB VW
 Sample Date: 1-23-18 Sample Time: 11:05 PDT
 Base Flow or Storm Event? Storm Field Filtered Time: 11:10 PST: X
(Must filter within 15 minutes of collection)

SITE ID: TOSMO
 Project Number: 14-05806-000



Project Name: Redmond Paired Watershed Study
 Current Weather and Temp: Rain 43°F

Water Quality Sampling

Sample ID: TOSMO-20180123

| Parameter | Bottle Type | Bottle Volume | # Bottles | Preservative | Duplicated? |
|---------------------------|-------------|---------------|-----------|--------------------------------|-------------|
| TSS and Turbidity | HDPE | 1L | 1 | NA | N |
| DOC * | HDPE | 250 ml | 1 | HCL | ↓ |
| Fecal Col. Bact. | HDPE | 250 ml | 1 | EDTA | |
| T. Phosphorous | HDPE | 250 ml | 1 | H ₂ SO ₄ | |
| T. Nitrogen | HDPE | 250 ml | 1 | H ₂ SO ₄ | |
| Diss. Cu and Zn * | HDPE | 250 ml | 1 | HNO ₃ | |
| Hardness, Total Cu and Zn | HDPE | 500 ml | 1 | HNO ₃ | |

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID: _____
 Filter blank sample ID: _____
 Transfer blank sample ID: _____

Visual and Olfactory Conditions:

Clarity: _____
 Color: cloudy grayish
 Odor: none
 Sheen: _____
 Floatables: _____

LABORATORY DELIVERY

Date: _____ Time: _____

Quality Assurance

Checked By: T. Lenth Signature: _____
 Date Checked: 2-6-18 Time: _____
 Data Entered into Database? YES X NO _____ initials: _____
 Date Entered: _____ Time: _____
 Notes: _____

Field Meter Calibration

Check which field meter was used and complete the meter calibration form
 YSI Pro Plus (15D100020) _____
 YSI Pro DSS 1 _____
 YSI Pro DSS 2 X

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)
 Stream Stage (ft): 0.76
 Reference Point (description): SG

Water Quality Measurements

Temperature (°C) 7.7
 Specific Conductivity (µs/cm) 1100.2
 Dissolved Oxygen (mg/L) 11.31

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: BB vni
 Sample Date: 1.23.18 Sample Time: 11:40 PDT:
 Base Flow or Storm Event? Storm Field Filtered Time: 11:45 PST: X
(Must filter within 15 minutes of collection)

SITE ID: TYLMI
 Project Number: 14-05806-000



Project Name: Redmond Paired Watershed Study
 Current Weather and Temp: Rain 43°F

Water Quality Sampling

Sample ID: TYLMI-20180123

| Parameter | Bottle Type | Bottle Volume | # Bottles | Preservative | Duplicated? |
|---------------------------|-------------|---------------|-----------|--------------------------------|-------------|
| TSS and Turbidity | HDPE | 1L | 1 | NA | N |
| DOC * | HDPE | 250 ml | 1 | HCL | L |
| Fecal Col. Bact. | HDPE | 250 ml | 1 | EDTA | |
| T. Phosphorous | HDPE | 250 ml | 1 | H ₂ SO ₄ | |
| T Nitrogen | HDPE | 250 ml | 1 | H ₂ SO ₄ | |
| Diss. Cu and Zn * | HDPE | 250 ml | 1 | HNO ₃ | |
| Hardness, Total Cu and Zn | HDPE | 500 ml | 1 | HNO ₃ | |

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID: _____
 Filter blank sample ID: _____
 Transfer blank sample ID: _____

Visual and Olfactory Conditions:

Clarity: UPAY
 Color: none
 Odor: sewer smell downstream
 Sheen: none
 Floatables: none

LABORATORY DELIVERY

Date: _____ Time: _____

Quality Assurance

Checked By: Z. Carth Signature: _____
 Date Checked: 2.16.18 Time: _____
 Data Entered into Database? YES NO initials:
 Date Entered: _____ Time: _____
 Notes: _____

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

YSI Pro Plus (15D100020) _____
 YSI Pro DSS 1 _____
 YSI Pro DSS 2 X

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): 4.872
 Reference Point (description): top of culvert L

Water Quality Measurements

Temperature (°C) 10.7
 Specific Conductivity (µs/cm) 133.8
 Dissolved Oxygen (mg/L) 11.58

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: BB VW
 Sample Date: 1-23-18 Sample Time: 11:25 PDT
 Base Flow or Storm Event? Storm Field Filtered Time: 11:30 PST: X
(Must filter within 15 minutes of collection)

SITE ID: TYLMO
 Project Number: 14-05806-000



Project Name: Redmond Paired Watershed Study
 Current Weather and Temp: Rain 43°F

Water Quality Sampling

Sample ID: TYLMO-20180123

| Parameter | Bottle Type | Bottle Volume | # Bottles | Preservative | Duplicated? |
|---------------------------|-------------|---------------|-----------|--------------------------------|-------------|
| TSS and Turbidity | HDPE | 1L | 1 | NA | N |
| DOC * | HDPE | 250 ml | 1 | HCL | |
| Fecal Col. Bact. | HDPE | 250 ml | 1 | EDTA | |
| T. Phosphorous | HDPE | 250 ml | 1 | H ₂ SO ₄ | |
| T. Nitrogen | HDPE | 250 ml | 1 | H ₂ SO ₄ | |
| Diss. Cu and Zn * | HDPE | 250 ml | 1 | HNO ₃ | |
| Hardness, Total Cu and Zn | HDPE | 500 ml | 1 | HNO ₃ | |

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID: _____
 Filter blank sample ID: _____
 Transfer blank sample ID: _____

Visual and Olfactory Conditions:

Clarity: clear
 Color: none
 Odor: ↓
 Sheen: _____
 Floatables: _____

LABORATORY DELIVERY.

Date: _____ Time: _____

Quality Assurance

Checked By: S. Lenth Signature: [Signature]
 Date Checked: 2-16-18 Time: _____
 Data Entered into Database? YES NO initials: _____
 Date Entered: _____ Time: _____
 Notes: _____

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

YSI Pro Plus (15D100020) _____
 YSI Pro DSS 1 _____
 YSI Pro DSS 2 X

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): 2.72
 Reference Point (description): top of invert

Water Quality Measurements

Temperature (°C) 6.9
 Specific Conductivity (µs/cm) 90.8
 Dissolved Oxygen (mg/L) 1.89



Data Quality Assurance Worksheet

Project Name/No./Client: Redmond Paired Watershed Study / 14-05806-000 / City of Redmond

Laboratory/Parameters: OnSite Environmental : TSS, turbidity, hardness, DOC, TP, Dissolved & Total Cu, Zn / AmTest: Total nitrogen, fecal coliform bacteria

Sample Date/Sample ID: 1/23/2018 / All sites, 1 FD (QA42) at SEIMN

By G. Catarra

Date 2/16/2018 Page 1 of 2

Checked: initials JL

date 2/16/2018

| Parameter | Completeness/ Methodology | Pre-preservation Holding Times (minutes) | | Total Holding Times (days) | | Method Blanks Reporting Limit | Matrix Spikes/ Surrogate Recovery (%) | | Lab Control Samples Recovery (%) | | Lab Duplicates RPD (%) | | Field Duplicates RPD (%) | | Instrument Calibration/ Performance | ACTION |
|-------------------------------------|------------------------------|--|------|-------------------------------|------|--|---|-------------------|--|-------------------|---------------------------|-------------------|-----------------------------|-------------------|---|--|
| | | Reported | Goal | Reported | Goal | | Reported | Goal ¹ | Reported | Goal ¹ | Reported | Goal ¹ | Reported | Goal ¹ | | |
| TSS | OK / SM 2540D | NA | NA | 1 | ≤7 | ≤1.0 mg/L 1.0 mg/L | NA | NA | 95 | ±20 | 6 | ≤25 | 7.4 | ≤25 | OK | NONE |
| Turbidity | OK / EPA 180.1 | NA | NA | 1 | ≤2 | ≤0.1 NTU 0.1 NTU | NA | NA | NA | ±10 | 1 | ≤25 | 13 | ≤25 | OK | NONE |
| Hardness | OK / SM 2340B | NA | NA | 6 | ≤180 | ≤1.0 mg/L 1.0 mg/L | 102,100 | ±25 | 103 | ±15 | 0 | ≤20 | 0 | ≤20 | OK | NONE |
| DOC | OK / SM 5310B | <15 | ≤15 | 2 | ≤28 | ≤1.0 mg/L 1.0 mg/L | 89 | ±25 | 100 | ±15 | 1 | ≤20 | 1.4 | ≤20 | OK | NONE |
| Total Phosphorus | OK / EPA 365.1 | NA | NA | 3 | ≤28 | ≤0.01 mg/L 0.01 mg/L | 94 | ±25 | 101 | ±20 | NC | ≤20 | D=0.001 | ≤20 | OK | NONE |
| Total Nitrogen (TKN + N+N) | OK/ SM 4500 N-B | NA | NA | 9-14 | ≤28 | ≤0.1 mg/L 0.1 mg/L | 98-124 | ±25 | 93-105 | ±20 | 2.7-18 | ≤20 | D=0.064 111 | ≤20 | OK | FLAG N-N AND TOTAL NITROGEN "J" FOR SEIMN DUE TO FIELD DUP RPD |

¹ If the sample or duplicate value is less than five times the reporting limit, the difference is calculated rather than the relative percent difference (RPD). The QA goal is a difference <2 times the detection limit instead of the number indicated in the goal column.

NA – not applicable or not available; NC – not calculable due to one or more values below the detection limit; NS – field duplicate not sampled.



Data Quality Assurance Worksheet

By G. Catarra

Project Name/No./Client: Redmond Paired Watershed Study / 14-05806-000 / City of Redmond

Date 2/16/2018 Page 2 of 2

Laboratory/Parameters: OnSite Environmental : TSS, turbidity, hardness, DOC, TP, Dissolved & Total Cu, Zn / AmTest: total nitrogen, fecal coliform bacteria

Checked: initials
JL

Sample Date/Sample ID: 1/23/2018 / All sites, 1 FD (QA42) at SEIMN

date 2/16/2018

| Parameter | Completeness/ Methodology | Pre-preservation Holding Times (minutes) | | Total Holding Times (days) | | Method Blanks Reporting Limit | Matrix Spikes/ Surrogate Recovery (%) | | Lab Control Samples Recovery (%) | | Lab Duplicates RPD (%) | | Field Duplicates RPD (%) | | Instrument Calibration/ Performance | ACTION |
|------------------|------------------------------|--|------|-------------------------------|------|--|---|-------------------|--|------|---------------------------|-------------------|-----------------------------|-------------------|---|--------|
| | | Reported | Goal | Reported | Goal | | Reported | Goal ¹ | Reported | Goal | Reported | Goal ¹ | Reported | Goal ¹ | | |
| Total Copper | OK/ EPA 200.8 | NA | NA | 14 | ≤180 | ≤1.0 µg/L 1.0 µg/L | 95,95 | ±25 | NR | ±15 | 2 | ≤20 | NC | ≤20 | OK | NONE |
| Total Zinc | OK/ EPA 200.8 | NA | NA | 14 | ≤180 | ≤5.0 µg/L 5.0 µg/L | 92,92 | ±25 | NR | ±15 | 3 | ≤20 | NC | ≤20 | OK | NONE |
| Dissolved Copper | OK/ EPA 200.8 | <15 | ≤15 | 14 | ≤180 | ≤1.0 µg/L 1.0 µg/L | 85,89 | ±25 | NR | ±15 | NC | ≤20 | NC | ≤20 | OK | NONE |
| Dissolved Zinc | OK/ EPA 200.8 | <15 | ≤15 | 14 | ≤180 | ≤5.0 µg/L 5.0 µg/L | 88,86 | ±25 | NR | ±15 | NC | ≤20 | NC | ≤20 | OK | NONE |
| Fecal Coliform | OK / SM 9222D | NA | NA | <1 | ≤1 | ≤1.0 cfu/ 100mL 10 cfu/ 100mL | NA | NA | NA | NA | NC,0 | ≤35 | 0 | ≤50 | OK | NONE |

¹ If the sample or duplicate value is less than five times the reporting limit, the difference is calculated rather than the relative percent difference (RPD). The QA goal is a difference <2 times the detection limit instead of the number indicated in the goal column.

NA – not applicable or not available; NC – not calculable due to one or more values below the detection limit; NS – field duplicate not sampled.



14648 NE 95th Street, Redmond, WA 98052 • (425) 883-3881

February 16, 2018

George Iftner
Herrera Environmental Consultants, Inc.
2200 6th Avenue, Suite 1100
Seattle, WA 98121

Re: Analytical Data for Project 14-05806-000
Laboratory Reference No. 1801-296

Dear George:

Enclosed are the analytical results and associated quality control data for samples submitted on January 29, 2018.

The standard policy of OnSite Environmental, Inc. is to store your samples for 30 days from the date of receipt. If you require longer storage, please contact the laboratory.

We appreciate the opportunity to be of service to you on this project. If you have any questions concerning the data, or need additional information, please feel free to call me.

Sincerely,

A handwritten signature in black ink, appearing to read "Blair Goodrow", enclosed within a large, loopy circular flourish.

Blair Goodrow
Project Manager

Enclosures



OnSite Environmental, Inc. 14648 NE 95th Street, Redmond, WA 98052 (425) 883-3881

This report pertains to the samples analyzed in accordance with the chain of custody, and is intended only for the use of the individual or company to whom it is addressed.

Date of Report: February 16, 2018
Samples Submitted: January 29, 2018
Laboratory Reference: 1801-296
Project: 14-05806-000

Case Narrative

Samples were collected on January 29, 2018 and received by the laboratory on January 29, 2018. They were maintained at the laboratory at a temperature of 2°C to 6°C.

Please note that any and all soil sample results are reported on a dry-weight basis, unless otherwise noted below.

General QA/QC issues associated with the analytical data enclosed in this laboratory report will be indicated with a reference to a comment or explanation on the Data Qualifier page. More complex and involved QA/QC issues will be discussed in detail below.



Date of Report: February 16, 2018
 Samples Submitted: January 29, 2018
 Laboratory Reference: 1801-296
 Project: 14-05806-000

**TOTAL SUSPENDED SOLIDS
 SM 2540D**

Matrix: Water
 Units: mg/L

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|------------------------|----------------------|-----|----------|---------------|---------------|-------|
| Client ID: | COLM-20180129 | | | | | |
| Laboratory ID: | 01-296-01 | | | | | |
| Total Suspended Solids | 1.6 | 1.0 | SM 2540D | 1-30-18 | 1-31-18 | |

| | | | | | | |
|------------------------|-----------------------|-----|----------|---------|---------|--|
| Client ID: | COUMI-20180129 | | | | | |
| Laboratory ID: | 01-296-02 | | | | | |
| Total Suspended Solids | 25 | 1.0 | SM 2540D | 1-30-18 | 1-31-18 | |

| | | | | | | |
|------------------------|-----------------------|-----|----------|---------|---------|--|
| Client ID: | COUMO-20180129 | | | | | |
| Laboratory ID: | 01-296-03 | | | | | |
| Total Suspended Solids | 44 | 1.7 | SM 2540D | 1-30-18 | 1-31-18 | |

| | | | | | | |
|------------------------|-----------------------|-----|----------|---------|---------|--|
| Client ID: | EVAMS-20180129 | | | | | |
| Laboratory ID: | 01-296-04 | | | | | |
| Total Suspended Solids | 8.4 | 1.0 | SM 2540D | 1-30-18 | 1-31-18 | |

| | | | | | | |
|------------------------|------------------------|-----|----------|---------|---------|--|
| Client ID: | EVALSS-20180129 | | | | | |
| Laboratory ID: | 01-296-05 | | | | | |
| Total Suspended Solids | 8.6 | 1.0 | SM 2540D | 1-30-18 | 1-31-18 | |

| | | | | | | |
|------------------------|-----------------------|-----|----------|---------|---------|--|
| Client ID: | MONMN-20180129 | | | | | |
| Laboratory ID: | 01-296-06 | | | | | |
| Total Suspended Solids | 17 | 1.0 | SM 2540D | 1-30-18 | 1-31-18 | |

| | | | | | | |
|------------------------|-----------------------|-----|----------|---------|---------|--|
| Client ID: | MONMS-20180129 | | | | | |
| Laboratory ID: | 01-296-07 | | | | | |
| Total Suspended Solids | 4.4 | 1.0 | SM 2540D | 1-30-18 | 1-31-18 | |



Date of Report: February 16, 2018
 Samples Submitted: January 29, 2018
 Laboratory Reference: 1801-296
 Project: 14-05806-000

**TOTAL SUSPENDED SOLIDS
SM 2540D**

Matrix: Water
 Units: mg/L

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|------------------------|----------------------|-----|----------|---------------|---------------|-------|
| Client ID: | MONM-20180129 | | | | | |
| Laboratory ID: | 01-296-08 | | | | | |
| Total Suspended Solids | 33 | 1.7 | SM 2540D | 1-30-18 | 1-31-18 | |

| | | | | | | |
|------------------------|-----------------------|-----|----------|---------|---------|--|
| Client ID: | SEIMN-20180129 | | | | | |
| Laboratory ID: | 01-296-09 | | | | | |
| Total Suspended Solids | 11 | 1.0 | SM 2540D | 1-30-18 | 1-31-18 | |

| | | | | | | |
|------------------------|-----------------------|-----|----------|---------|---------|--|
| Client ID: | SEIMS-20180129 | | | | | |
| Laboratory ID: | 01-296-10 | | | | | |
| Total Suspended Solids | 23 | 1.0 | SM 2540D | 1-30-18 | 1-31-18 | |

| | | | | | | |
|------------------------|-----------------------|-----|----------|---------|---------|--|
| Client ID: | TOSMI-20180129 | | | | | |
| Laboratory ID: | 01-296-11 | | | | | |
| Total Suspended Solids | 60 | 1.7 | SM 2540D | 1-30-18 | 1-31-18 | |

| | | | | | | |
|------------------------|-----------------------|-----|----------|---------|---------|--|
| Client ID: | TOSMO-20180129 | | | | | |
| Laboratory ID: | 01-296-12 | | | | | |
| Total Suspended Solids | 80 | 1.7 | SM 2540D | 1-30-18 | 1-31-18 | |

| | | | | | | |
|------------------------|-----------------------|-----|----------|---------|---------|--|
| Client ID: | TYLMI-20180129 | | | | | |
| Laboratory ID: | 01-296-13 | | | | | |
| Total Suspended Solids | 6.8 | 1.0 | SM 2540D | 1-30-18 | 1-31-18 | |

| | | | | | | |
|------------------------|-----------------------|-----|----------|---------|---------|--|
| Client ID: | TYLMO-20180129 | | | | | |
| Laboratory ID: | 01-296-14 | | | | | |
| Total Suspended Solids | 13 | 1.0 | SM 2540D | 1-30-18 | 1-31-18 | |



Date of Report: February 16, 2018
Samples Submitted: January 29, 2018
Laboratory Reference: 1801-296
Project: 14-05806-000

TOTAL SUSPENDED SOLIDS
SM 2540D

Matrix: Water
Units: mg/L

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|------------------------|----------------------|------------|---------------|----------------------|----------------------|--------------|
| Client ID: | QA42-20180129 | | | | | |
| Laboratory ID: | 01-296-15 | | | | | |
| Total Suspended Solids | 25 | 1.0 | SM 2540D | 1-30-18 | 1-31-18 | |



Date of Report: February 16, 2018
 Samples Submitted: January 29, 2018
 Laboratory Reference: 1801-296
 Project: 14-05806-000

**TOTAL SUSPENDED SOLIDS
 SM 2540D
 QUALITY CONTROL**

Matrix: Water
 Units: mg/L

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|------------------------|-----------|-----|----------|---------------|---------------|-------|
| METHOD BLANK | | | | | | |
| Laboratory ID: | MB0130W1 | | | | | |
| Total Suspended Solids | ND | 1.0 | SM 2540D | 1-30-18 | 1-31-18 | |

| Analyte | Result | Spike Level | Source Result | Percent Recovery | Recovery Limits | RPD | RPD Limit | Flags |
|------------------------|-------------|-------------|---------------|------------------|-----------------|-----|-----------|-------|
| DUPLICATE | | | | | | | | |
| Laboratory ID: | 01-296-06 | | | | | | | |
| | ORIG | DUP | | | | | | |
| Total Suspended Solids | 16.6 | 16.8 | NA | NA | NA | 1 | 17 | |

| | | | | | | | | |
|------------------------|-------------|-----|----|----|--------|----|----|--|
| SPIKE BLANK | | | | | | | | |
| Laboratory ID: | SB0130W1 | | | | | | | |
| | SB | SB | | SB | | | | |
| Total Suspended Solids | 99.0 | 100 | NA | 99 | 76-114 | NA | NA | |



Date of Report: February 16, 2018
 Samples Submitted: January 29, 2018
 Laboratory Reference: 1801-296
 Project: 14-05806-000

TURBIDITY
EPA 180.1

Matrix: Water
 Units: NTU

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|-------------------|----------------------|------|-----------|---------------|---------------|-------|
| Client ID: | COLM-20180129 | | | | | |
| Laboratory ID: | 01-296-01 | | | | | |
| Turbidity | 0.51 | 0.10 | EPA 180.1 | 1-30-18 | 1-30-18 | |

| | | | | | | |
|-------------------|-----------------------|------|-----------|---------|---------|--|
| Client ID: | COUMI-20180129 | | | | | |
| Laboratory ID: | 01-296-02 | | | | | |
| Turbidity | 5.6 | 0.10 | EPA 180.1 | 1-30-18 | 1-30-18 | |

| | | | | | | |
|-------------------|-----------------------|------|-----------|---------|---------|--|
| Client ID: | COUMO-20180129 | | | | | |
| Laboratory ID: | 01-296-03 | | | | | |
| Turbidity | 10.0 | 0.10 | EPA 180.1 | 1-30-18 | 1-30-18 | |

| | | | | | | |
|-------------------|-----------------------|------|-----------|---------|---------|--|
| Client ID: | EVAMS-20180129 | | | | | |
| Laboratory ID: | 01-296-04 | | | | | |
| Turbidity | 2.0 | 0.10 | EPA 180.1 | 1-30-18 | 1-30-18 | |

| | | | | | | |
|-------------------|------------------------|------|-----------|---------|---------|--|
| Client ID: | EVALSS-20180129 | | | | | |
| Laboratory ID: | 01-296-05 | | | | | |
| Turbidity | 3.2 | 0.10 | EPA 180.1 | 1-30-18 | 1-30-18 | |

| | | | | | | |
|-------------------|-----------------------|------|-----------|---------|---------|--|
| Client ID: | MONMN-20180129 | | | | | |
| Laboratory ID: | 01-296-06 | | | | | |
| Turbidity | 10 | 0.10 | EPA 180.1 | 1-30-18 | 1-30-18 | |

| | | | | | | |
|-------------------|-----------------------|------|-----------|---------|---------|--|
| Client ID: | MONMS-20180129 | | | | | |
| Laboratory ID: | 01-296-07 | | | | | |
| Turbidity | 3.1 | 0.10 | EPA 180.1 | 1-30-18 | 1-30-18 | |



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TURBIDITY
EPA 180.1

Matrix: Water
 Units: NTU

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|-------------------|----------------------|------|-----------|---------------|---------------|-------|
| Client ID: | MONM-20180129 | | | | | |
| Laboratory ID: | 01-296-08 | | | | | |
| Turbidity | 11 | 0.10 | EPA 180.1 | 1-30-18 | 1-30-18 | |

| | | | | | | |
|-------------------|-----------------------|------|-----------|---------|---------|--|
| Client ID: | SEIMN-20180129 | | | | | |
| Laboratory ID: | 01-296-09 | | | | | |
| Turbidity | 3.9 | 0.10 | EPA 180.1 | 1-30-18 | 1-30-18 | |

| | | | | | | |
|-------------------|-----------------------|------|-----------|---------|---------|--|
| Client ID: | SEIMS-20180129 | | | | | |
| Laboratory ID: | 01-296-10 | | | | | |
| Turbidity | 5.7 | 0.10 | EPA 180.1 | 1-30-18 | 1-30-18 | |

| | | | | | | |
|-------------------|-----------------------|------|-----------|---------|---------|--|
| Client ID: | TOSMI-20180129 | | | | | |
| Laboratory ID: | 01-296-11 | | | | | |
| Turbidity | 16 | 0.10 | EPA 180.1 | 1-30-18 | 1-30-18 | |

| | | | | | | |
|-------------------|-----------------------|------|-----------|---------|---------|--|
| Client ID: | TOSMO-20180129 | | | | | |
| Laboratory ID: | 01-296-12 | | | | | |
| Turbidity | 15 | 0.10 | EPA 180.1 | 1-30-18 | 1-30-18 | |

| | | | | | | |
|-------------------|-----------------------|------|-----------|---------|---------|--|
| Client ID: | TYLMI-20180129 | | | | | |
| Laboratory ID: | 01-296-13 | | | | | |
| Turbidity | 4.6 | 0.10 | EPA 180.1 | 1-30-18 | 1-30-18 | |

| | | | | | | |
|-------------------|-----------------------|------|-----------|---------|---------|--|
| Client ID: | TYLMO-20180129 | | | | | |
| Laboratory ID: | 01-296-14 | | | | | |
| Turbidity | 8.9 | 0.10 | EPA 180.1 | 1-30-18 | 1-30-18 | |



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TURBIDITY
EPA 180.1

Matrix: Water
Units: NTU

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|-------------------|----------------------|------------|---------------|----------------------|----------------------|--------------|
| Client ID: | QA42-20180129 | | | | | |
| Laboratory ID: | 01-296-15 | | | | | |
| Turbidity | 13 | 0.10 | EPA 180.1 | 1-30-18 | 1-30-18 | |



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**TURBIDITY
 EPA 180.1
 QUALITY CONTROL**

Matrix: Water
 Units: NTU

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|---------------------|-----------|------|-----------|---------------|---------------|-------|
| METHOD BLANK | | | | | | |
| Laboratory ID: | MB0130W1 | | | | | |
| Turbidity | ND | 0.10 | EPA 180.1 | 1-30-18 | 1-30-18 | |

| Analyte | Result | Spike Level | Source Result | Percent Recovery | Recovery Limits | RPD | RPD Limit | Flags |
|------------------|--------------|--------------|---------------|------------------|-----------------|-----|-----------|-------|
| DUPLICATE | | | | | | | | |
| Laboratory ID: | 01-296-01 | | | | | | | |
| | ORIG | DUP | | | | | | |
| Turbidity | 0.510 | 0.520 | NA | NA | NA | NA | 2 | 15 |



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HARDNESS
EPA 200.7/SM 2340B

Matrix: Water
 Units: mg eqt. CaCO₃/L (ppm)

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|-------------------|----------------------|-----|----------------|---------------|---------------|-------|
| Client ID: | COLM-20180129 | | | | | |
| Laboratory ID: | 01-296-01 | | | | | |
| Hardness | 7.7 | 1.0 | 200.7/SM 2340B | 1-30-18 | 1-30-18 | |

| | | | | | | |
|-------------------|-----------------------|-----|----------------|---------|------------|--|
| Client ID: | COUMI-20180129 | | | | | |
| Laboratory ID: | 01-296-02 | | | | | |
| Hardness | 59 | 1.0 | 200.7/SM 2340B | 1-30-18 | 1-30&31-18 | |

| | | | | | | |
|-------------------|-----------------------|-----|----------------|---------|------------|--|
| Client ID: | COUMO-20180129 | | | | | |
| Laboratory ID: | 01-296-03 | | | | | |
| Hardness | 56 | 1.0 | 200.7/SM 2340B | 1-30-18 | 1-30&31-18 | |

| | | | | | | |
|-------------------|-----------------------|-----|----------------|---------|------------|--|
| Client ID: | EVAMS-20180129 | | | | | |
| Laboratory ID: | 01-296-04 | | | | | |
| Hardness | 71 | 1.0 | 200.7/SM 2340B | 1-30-18 | 1-30&31-18 | |

| | | | | | | |
|-------------------|------------------------|-----|----------------|---------|------------|--|
| Client ID: | EVALSS-20180129 | | | | | |
| Laboratory ID: | 01-296-05 | | | | | |
| Hardness | 67 | 1.0 | 200.7/SM 2340B | 1-30-18 | 1-30&31-18 | |

| | | | | | | |
|-------------------|-----------------------|-----|----------------|---------|------------|--|
| Client ID: | MONMN-20180129 | | | | | |
| Laboratory ID: | 01-296-06 | | | | | |
| Hardness | 47 | 1.0 | 200.7/SM 2340B | 1-30-18 | 1-30&31-18 | |

| | | | | | | |
|-------------------|-----------------------|-----|----------------|---------|------------|--|
| Client ID: | MONMS-20180129 | | | | | |
| Laboratory ID: | 01-296-07 | | | | | |
| Hardness | 80 | 1.0 | 200.7/SM 2340B | 1-30-18 | 1-30&31-18 | |



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HARDNESS
EPA 200.7/SM 2340B

Matrix: Water
 Units: mg eqt. CaCO₃/L (ppm)

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|-------------------|----------------------|-----|----------------|---------------|---------------|-------|
| Client ID: | MONM-20180129 | | | | | |
| Laboratory ID: | 01-296-08 | | | | | |
| Hardness | 55 | 1.0 | 200.7/SM 2340B | 1-30-18 | 1-30&31-18 | |

| | | | | | | |
|-------------------|-----------------------|-----|----------------|---------|---------|--|
| Client ID: | SEIMN-20180129 | | | | | |
| Laboratory ID: | 01-296-09 | | | | | |
| Hardness | 19 | 1.0 | 200.7/SM 2340B | 1-30-18 | 1-30-18 | |

| | | | | | | |
|-------------------|-----------------------|-----|----------------|---------|---------|--|
| Client ID: | SEIMS-20180129 | | | | | |
| Laboratory ID: | 01-296-10 | | | | | |
| Hardness | 33 | 1.0 | 200.7/SM 2340B | 1-30-18 | 1-30-18 | |

| | | | | | | |
|-------------------|-----------------------|-----|----------------|---------|------------|--|
| Client ID: | TOSMI-20180129 | | | | | |
| Laboratory ID: | 01-296-11 | | | | | |
| Hardness | 46 | 1.0 | 200.7/SM 2340B | 1-30-18 | 1-30&31-18 | |

| | | | | | | |
|-------------------|-----------------------|-----|----------------|---------|------------|--|
| Client ID: | TOSMO-20180129 | | | | | |
| Laboratory ID: | 01-296-12 | | | | | |
| Hardness | 68 | 1.0 | 200.7/SM 2340B | 1-30-18 | 1-30&31-18 | |

| | | | | | | |
|-------------------|-----------------------|-----|----------------|---------|------------|--|
| Client ID: | TYLMI-20180129 | | | | | |
| Laboratory ID: | 01-296-13 | | | | | |
| Hardness | 57 | 1.0 | 200.7/SM 2340B | 1-30-18 | 1-30&31-18 | |

| | | | | | | |
|-------------------|-----------------------|-----|----------------|---------|---------|--|
| Client ID: | TYLMO-20180129 | | | | | |
| Laboratory ID: | 01-296-14 | | | | | |
| Hardness | 28 | 1.0 | 200.7/SM 2340B | 1-30-18 | 1-30-18 | |



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HARDNESS
EPA 200.7/SM 2340B

Matrix: Water
Units: mg eqt. CaCO₃/L (ppm)

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|-------------------|----------------------|------------|----------------|----------------------|----------------------|--------------|
| Client ID: | QA42-20180129 | | | | | |
| Laboratory ID: | 01-296-15 | | | | | |
| Hardness | 46 | 1.0 | 200.7/SM 2340B | 1-30-18 | 1-30&31-18 | |



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HARDNESS
EPA 200.7/SM 2340B
QUALITY CONTROL

Matrix: Water
 Units: mg eqt. CaCO₃/L (ppm)

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|---------------------|-----------|-----|----------------|---------------|---------------|-------|
| METHOD BLANK | | | | | | |
| Laboratory ID: | MB0130WH1 | | | | | |
| Hardness | ND | 1.0 | 200.7/SM 2340B | 1-30-18 | 1-30-18 | |

| Analyte | Result | Spike Level | Source Result | Percent Recovery | Recovery Limits | RPD | RPD Limit | Flags |
|------------------|-------------|-------------|---------------|------------------|-----------------|-----|-----------|-------|
| DUPLICATE | | | | | | | | |
| Laboratory ID: | 01-296-01 | | | | | | | |
| | ORIG | DUP | | | | | | |
| Hardness | 7.69 | 7.56 | NA | NA | NA | 2 | 20 | |

| Analyte | Result | Spike Level | Source Result | Percent Recovery | Recovery Limits | RPD | RPD Limit | Flags | | |
|----------------------|------------|-------------|---------------|------------------|-----------------|-----|-----------|--------|---|----|
| MATRIX SPIKES | | | | | | | | | | |
| Laboratory ID: | 01-296-01 | | | | | | | | | |
| | MS | MSD | MS | MSD | MS | MSD | | | | |
| Hardness | 145 | 141 | 132 | 132 | 7.69 | 104 | 101 | 75-125 | 3 | 20 |

| Analyte | Result | Spike Level | Source Result | Percent Recovery | Recovery Limits | RPD | RPD Limit | Flags |
|--------------------|------------|-------------|---------------|------------------|-----------------|-----|-----------|-------|
| SPIKE BLANK | | | | | | | | |
| Laboratory ID: | SB0130WH1 | | | | | | | |
| | SB | SB | | | SB | | | |
| Hardness | 137 | 132 | NA | 104 | 80-120 | NA | NA | |



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**DISSOLVED ORGANIC CARBON
 SM 5310B**

Matrix: Water
 Units: mg/L

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|--------------------------|------------------------|-----|----------|---------------|---------------|-------|
| Client ID: | COLM-20180129 | | | | | |
| Laboratory ID: | 01-296-01 | | | | | |
| Dissolved Organic Carbon | 9.8 | 1.0 | SM 5310B | 2-5-18 | 2-5-18 | |
| Client ID: | COUMI-20180129 | | | | | |
| Laboratory ID: | 01-296-02 | | | | | |
| Dissolved Organic Carbon | 3.8 | 1.0 | SM 5310B | 2-5-18 | 2-5-18 | |
| Client ID: | COUMO-20180129 | | | | | |
| Laboratory ID: | 01-296-03 | | | | | |
| Dissolved Organic Carbon | 3.7 | 1.0 | SM 5310B | 2-5-18 | 2-5-18 | |
| Client ID: | EVAMS-20180129 | | | | | |
| Laboratory ID: | 01-296-04 | | | | | |
| Dissolved Organic Carbon | 4.7 | 1.0 | SM 5310B | 2-5-18 | 2-5-18 | |
| Client ID: | EVALSS-20180129 | | | | | |
| Laboratory ID: | 01-296-05 | | | | | |
| Dissolved Organic Carbon | 5.0 | 1.0 | SM 5310B | 2-5-18 | 2-5-18 | |
| Client ID: | MONMN-20180129 | | | | | |
| Laboratory ID: | 01-296-06 | | | | | |
| Dissolved Organic Carbon | 4.5 | 1.0 | SM 5310B | 2-5-18 | 2-5-18 | |
| Client ID: | MONMS-20180129 | | | | | |
| Laboratory ID: | 01-296-07 | | | | | |
| Dissolved Organic Carbon | 5.8 | 1.0 | SM 5310B | 2-5-18 | 2-5-18 | |



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**DISSOLVED ORGANIC CARBON
 SM 5310B**

Matrix: Water
 Units: mg/L

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|--------------------------|-----------------------|-----|----------|---------------|---------------|-------|
| Client ID: | MONM-20180129 | | | | | |
| Laboratory ID: | 01-296-08 | | | | | |
| Dissolved Organic Carbon | 5.1 | 1.0 | SM 5310B | 2-5-18 | 2-5-18 | |
| Client ID: | SEIMN-20180129 | | | | | |
| Laboratory ID: | 01-296-09 | | | | | |
| Dissolved Organic Carbon | 7.2 | 1.0 | SM 5310B | 2-5-18 | 2-5-18 | |
| Client ID: | SEIMS-20180129 | | | | | |
| Laboratory ID: | 01-296-10 | | | | | |
| Dissolved Organic Carbon | 5.8 | 1.0 | SM 5310B | 2-5-18 | 2-5-18 | |
| Client ID: | TOSMI-20180129 | | | | | |
| Laboratory ID: | 01-296-11 | | | | | |
| Dissolved Organic Carbon | 4.0 | 1.0 | SM 5310B | 2-5-18 | 2-5-18 | |
| Client ID: | TOSMO-20180129 | | | | | |
| Laboratory ID: | 01-296-12 | | | | | |
| Dissolved Organic Carbon | 4.6 | 1.0 | SM 5310B | 2-5-18 | 2-5-18 | |
| Client ID: | TYLMI-20180129 | | | | | |
| Laboratory ID: | 01-296-13 | | | | | |
| Dissolved Organic Carbon | 5.6 | 1.0 | SM 5310B | 2-5-18 | 2-5-18 | |
| Client ID: | TYLMO-20180129 | | | | | |
| Laboratory ID: | 01-296-14 | | | | | |
| Dissolved Organic Carbon | 3.2 | 1.0 | SM 5310B | 2-5-18 | 2-5-18 | |



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**DISSOLVED ORGANIC CARBON
SM 5310B**

Matrix: Water
Units: mg/L

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|--------------------------|----------------------|------------|---------------|----------------------|----------------------|--------------|
| Client ID: | QA42-20180129 | | | | | |
| Laboratory ID: | 01-296-15 | | | | | |
| Dissolved Organic Carbon | 4.7 | 1.0 | SM 5310B | 2-5-18 | 2-5-18 | |



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**DISSOLVED ORGANIC CARBON
 SM 5310B
 QUALITY CONTROL**

Matrix: Water
 Units: mg/L

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|--------------------------|-----------|-----|----------|---------------|---------------|-------|
| METHOD BLANK | | | | | | |
| Laboratory ID: | MB0205D1 | | | | | |
| Dissolved Organic Carbon | ND | 1.0 | SM 5310B | 2-5-18 | 2-5-18 | |

| Analyte | Result | Spike Level | Source Result | Percent Recovery | Recovery Limits | RPD | RPD Limit | Flags |
|--------------------------|-------------|-------------|---------------|------------------|-----------------|-----|-----------|-------|
| DUPLICATE | | | | | | | | |
| Laboratory ID: | 01-296-01 | | | | | | | |
| | ORIG | DUP | | | | | | |
| Dissolved Organic Carbon | 9.80 | 9.81 | NA | NA | NA | 0 | 15 | |

MATRIX SPIKE

| | | | | | | | | |
|--------------------------|-------------|------|------|----|--------|----|----|--|
| Laboratory ID: | 01-296-01 | | | | | | | |
| | MS | MS | | MS | | | | |
| Dissolved Organic Carbon | 19.1 | 10.0 | 9.80 | 93 | 75-125 | NA | NA | |

SPIKE BLANK

| | | | | | | | | |
|--------------------------|-------------|------|----|-----|--------|----|----|--|
| Laboratory ID: | SB0205D1 | | | | | | | |
| | SB | SB | | SB | | | | |
| Dissolved Organic Carbon | 10.0 | 10.0 | NA | 100 | 80-120 | NA | NA | |



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TOTAL PHOSPHORUS
EPA 365.1

Matrix: Water
 Units: mg/L

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|-------------------|----------------------|-------|-----------|---------------|---------------|-------|
| Client ID: | COLM-20180129 | | | | | |
| Laboratory ID: | 01-296-01 | | | | | |
| Total Phosphorus | 0.013 | 0.010 | EPA 365.1 | 2-6-18 | 2-6-18 | |

| | | | | | | |
|-------------------|-----------------------|-------|-----------|--------|--------|--|
| Client ID: | COUMI-20180129 | | | | | |
| Laboratory ID: | 01-296-02 | | | | | |
| Total Phosphorus | 0.048 | 0.010 | EPA 365.1 | 2-6-18 | 2-6-18 | |

| | | | | | | |
|-------------------|-----------------------|-------|-----------|--------|--------|--|
| Client ID: | COUMO-20180129 | | | | | |
| Laboratory ID: | 01-296-03 | | | | | |
| Total Phosphorus | 0.061 | 0.010 | EPA 365.1 | 2-6-18 | 2-6-18 | |

| | | | | | | |
|-------------------|-----------------------|-------|-----------|--------|--------|--|
| Client ID: | EVAMS-20180129 | | | | | |
| Laboratory ID: | 01-296-04 | | | | | |
| Total Phosphorus | 0.014 | 0.010 | EPA 365.1 | 2-6-18 | 2-6-18 | |

| | | | | | | |
|-------------------|------------------------|-------|-----------|--------|--------|--|
| Client ID: | EVALSS-20180129 | | | | | |
| Laboratory ID: | 01-296-05 | | | | | |
| Total Phosphorus | 0.018 | 0.010 | EPA 365.1 | 2-6-18 | 2-6-18 | |

| | | | | | | |
|-------------------|-----------------------|-------|-----------|--------|--------|--|
| Client ID: | MONMN-20180129 | | | | | |
| Laboratory ID: | 01-296-06 | | | | | |
| Total Phosphorus | 0.027 | 0.010 | EPA 365.1 | 2-6-18 | 2-6-18 | |

| | | | | | | |
|-------------------|-----------------------|-------|-----------|--------|--------|--|
| Client ID: | MONMS-20180129 | | | | | |
| Laboratory ID: | 01-296-07 | | | | | |
| Total Phosphorus | 0.021 | 0.010 | EPA 365.1 | 2-6-18 | 2-6-18 | |



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TOTAL PHOSPHORUS
EPA 365.1

Matrix: Water
 Units: mg/L

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|-------------------|----------------------|-------|-----------|---------------|---------------|-------|
| Client ID: | MONM-20180129 | | | | | |
| Laboratory ID: | 01-296-08 | | | | | |
| Total Phosphorus | 0.038 | 0.010 | EPA 365.1 | 2-6-18 | 2-6-18 | |

| | | | | | | |
|-------------------|-----------------------|-------|-----------|--------|--------|--|
| Client ID: | SEIMN-20180129 | | | | | |
| Laboratory ID: | 01-296-09 | | | | | |
| Total Phosphorus | 0.020 | 0.010 | EPA 365.1 | 2-6-18 | 2-6-18 | |

| | | | | | | |
|-------------------|-----------------------|-------|-----------|--------|--------|--|
| Client ID: | SEIMS-20180129 | | | | | |
| Laboratory ID: | 01-296-10 | | | | | |
| Total Phosphorus | 0.037 | 0.010 | EPA 365.1 | 2-6-18 | 2-6-18 | |

| | | | | | | |
|-------------------|-----------------------|-------|-----------|--------|--------|--|
| Client ID: | TOSMI-20180129 | | | | | |
| Laboratory ID: | 01-296-11 | | | | | |
| Total Phosphorus | 0.051 | 0.010 | EPA 365.1 | 2-6-18 | 2-6-18 | |

| | | | | | | |
|-------------------|-----------------------|-------|-----------|--------|--------|--|
| Client ID: | TOSMO-20180129 | | | | | |
| Laboratory ID: | 01-296-12 | | | | | |
| Total Phosphorus | 0.089 | 0.010 | EPA 365.1 | 2-6-18 | 2-6-18 | |

| | | | | | | |
|-------------------|-----------------------|-------|-----------|--------|--------|--|
| Client ID: | TYLMI-20180129 | | | | | |
| Laboratory ID: | 01-296-13 | | | | | |
| Total Phosphorus | 0.026 | 0.010 | EPA 365.1 | 2-6-18 | 2-6-18 | |

| | | | | | | |
|-------------------|-----------------------|-------|-----------|--------|--------|--|
| Client ID: | TYLMO-20180129 | | | | | |
| Laboratory ID: | 01-296-14 | | | | | |
| Total Phosphorus | 0.031 | 0.010 | EPA 365.1 | 2-6-18 | 2-6-18 | |



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TOTAL PHOSPHORUS
EPA 365.1

Matrix: Water
Units: mg/L

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|-------------------|----------------------|------------|---------------|----------------------|----------------------|--------------|
| Client ID: | QA42-20180129 | | | | | |
| Laboratory ID: | 01-296-15 | | | | | |
| Total Phosphorus | 0.047 | 0.010 | EPA 365.1 | 2-6-18 | 2-6-18 | |



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**TOTAL PHOSPHORUS
 EPA 365.1
 QUALITY CONTROL**

Matrix: Water
 Units: mg/L

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|---------------------|-----------|-------|-----------|---------------|---------------|-------|
| METHOD BLANK | | | | | | |
| Laboratory ID: | MB0206W1 | | | | | |
| Total Phosphorus | ND | 0.010 | EPA 365.1 | 2-6-18 | 2-6-18 | |

| Analyte | Result | Spike Level | Source Result | Percent Recovery | Recovery Limits | RPD | RPD Limit | Flags |
|------------------|---------------|---------------|---------------|------------------|-----------------|-----|-----------|-------|
| DUPLICATE | | | | | | | | |
| Laboratory ID: | 01-296-01 | | | | | | | |
| | ORIG | DUP | | | | | | |
| Total Phosphorus | 0.0125 | 0.0131 | NA | NA | NA | 5 | 11 | |

| | | | | | | | | |
|---------------------|--------------|-------|--------|-----|--------|----|----|--|
| MATRIX SPIKE | | | | | | | | |
| Laboratory ID: | 01-296-01 | | | | | | | |
| | MS | MS | | MS | | | | |
| Total Phosphorus | 0.262 | 0.250 | 0.0125 | 100 | 82-124 | NA | NA | |

| | | | | | | | | |
|--------------------|--------------|-------|----|----|--------|----|----|--|
| SPIKE BLANK | | | | | | | | |
| Laboratory ID: | SB0206W1 | | | | | | | |
| | SB | SB | | SB | | | | |
| Total Phosphorus | 0.223 | 0.250 | NA | 89 | 87-114 | NA | NA | |



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TOTAL METALS
EPA 200.8

Matrix: Water
 Units: ug/L (ppb)

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|-------------------|----------------------|-----|-----------|---------------|---------------|-------|
| Client ID: | COLM-20180129 | | | | | |
| Laboratory ID: | 01-296-01 | | | | | |
| Copper | ND | 1.0 | EPA 200.8 | 2-5-18 | 2-6-18 | |
| Zinc | ND | 5.0 | EPA 200.8 | 2-5-18 | 2-6-18 | |

| | | | | | | |
|-------------------|-----------------------|-----|-----------|--------|--------|--|
| Client ID: | COUMI-20180129 | | | | | |
| Laboratory ID: | 01-296-02 | | | | | |
| Copper | 2.5 | 1.0 | EPA 200.8 | 2-5-18 | 2-6-18 | |
| Zinc | 12 | 5.0 | EPA 200.8 | 2-5-18 | 2-6-18 | |

| | | | | | | |
|-------------------|-----------------------|-----|-----------|--------|--------|--|
| Client ID: | COUMO-20180129 | | | | | |
| Laboratory ID: | 01-296-03 | | | | | |
| Copper | 5.0 | 1.0 | EPA 200.8 | 2-5-18 | 2-6-18 | |
| Zinc | 26 | 5.0 | EPA 200.8 | 2-5-18 | 2-6-18 | |

| | | | | | | |
|-------------------|-----------------------|-----|-----------|--------|--------|--|
| Client ID: | EVAMS-20180129 | | | | | |
| Laboratory ID: | 01-296-04 | | | | | |
| Copper | ND | 1.0 | EPA 200.8 | 2-5-18 | 2-6-18 | |
| Zinc | ND | 5.0 | EPA 200.8 | 2-5-18 | 2-6-18 | |

| | | | | | | |
|-------------------|------------------------|-----|-----------|--------|--------|--|
| Client ID: | EVALSS-20180129 | | | | | |
| Laboratory ID: | 01-296-05 | | | | | |
| Copper | ND | 1.0 | EPA 200.8 | 2-5-18 | 2-6-18 | |
| Zinc | ND | 5.0 | EPA 200.8 | 2-5-18 | 2-6-18 | |

| | | | | | | |
|-------------------|-----------------------|-----|-----------|--------|--------|--|
| Client ID: | MONMN-20180129 | | | | | |
| Laboratory ID: | 01-296-06 | | | | | |
| Copper | 1.5 | 1.0 | EPA 200.8 | 2-5-18 | 2-6-18 | |
| Zinc | 5.3 | 5.0 | EPA 200.8 | 2-5-18 | 2-6-18 | |

| | | | | | | |
|-------------------|-----------------------|-----|-----------|--------|--------|--|
| Client ID: | MONMS-20180129 | | | | | |
| Laboratory ID: | 01-296-07 | | | | | |
| Copper | 1.6 | 1.0 | EPA 200.8 | 2-5-18 | 2-6-18 | |
| Zinc | ND | 5.0 | EPA 200.8 | 2-5-18 | 2-6-18 | |



Date of Report: February 16, 2018
 Samples Submitted: January 29, 2018
 Laboratory Reference: 1801-296
 Project: 14-05806-000

**TOTAL METALS
 EPA 200.8**

Matrix: Water
 Units: ug/L (ppb)

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|-------------------|----------------------|-----|-----------|---------------|---------------|-------|
| Client ID: | MONM-20180129 | | | | | |
| Laboratory ID: | 01-296-08 | | | | | |
| Copper | 2.8 | 1.0 | EPA 200.8 | 2-5-18 | 2-6-18 | |
| Zinc | 23 | 5.0 | EPA 200.8 | 2-5-18 | 2-6-18 | |

| | | | | | | |
|-------------------|-----------------------|-----|-----------|--------|--------|--|
| Client ID: | SEIMN-20180129 | | | | | |
| Laboratory ID: | 01-296-09 | | | | | |
| Copper | ND | 1.0 | EPA 200.8 | 2-5-18 | 2-6-18 | |
| Zinc | ND | 5.0 | EPA 200.8 | 2-5-18 | 2-6-18 | |

| | | | | | | |
|-------------------|-----------------------|-----|-----------|--------|--------|--|
| Client ID: | SEIMS-20180129 | | | | | |
| Laboratory ID: | 01-296-10 | | | | | |
| Copper | ND | 1.0 | EPA 200.8 | 2-5-18 | 2-6-18 | |
| Zinc | ND | 5.0 | EPA 200.8 | 2-5-18 | 2-6-18 | |

| | | | | | | |
|-------------------|-----------------------|-----|-----------|--------|--------|--|
| Client ID: | TOSMI-20180129 | | | | | |
| Laboratory ID: | 01-296-11 | | | | | |
| Copper | 9.5 | 1.0 | EPA 200.8 | 2-5-18 | 2-6-18 | |
| Zinc | 60 | 5.0 | EPA 200.8 | 2-5-18 | 2-6-18 | |

| | | | | | | |
|-------------------|-----------------------|-----|-----------|--------|--------|--|
| Client ID: | TOSMO-20180129 | | | | | |
| Laboratory ID: | 01-296-12 | | | | | |
| Copper | 8.4 | 1.0 | EPA 200.8 | 2-5-18 | 2-6-18 | |
| Zinc | 58 | 5.0 | EPA 200.8 | 2-5-18 | 2-6-18 | |

| | | | | | | |
|-------------------|-----------------------|-----|-----------|--------|--------|--|
| Client ID: | TYLMI-20180129 | | | | | |
| Laboratory ID: | 01-296-13 | | | | | |
| Copper | 2.6 | 1.0 | EPA 200.8 | 2-5-18 | 2-6-18 | |
| Zinc | 11 | 5.0 | EPA 200.8 | 2-5-18 | 2-6-18 | |

| | | | | | | |
|-------------------|-----------------------|-----|-----------|--------|--------|--|
| Client ID: | TYLMO-20180129 | | | | | |
| Laboratory ID: | 01-296-14 | | | | | |
| Copper | 3.4 | 1.0 | EPA 200.8 | 2-5-18 | 2-6-18 | |
| Zinc | 12 | 5.0 | EPA 200.8 | 2-5-18 | 2-6-18 | |



Date of Report: February 16, 2018
Samples Submitted: January 29, 2018
Laboratory Reference: 1801-296
Project: 14-05806-000

TOTAL METALS
EPA 200.8

Matrix: Water
Units: ug/L (ppb)

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|-------------------|----------------------|------------|---------------|----------------------|----------------------|--------------|
| Client ID: | QA42-20180129 | | | | | |
| Laboratory ID: | 01-296-15 | | | | | |
| Copper | 1.6 | 1.0 | EPA 200.8 | 2-5-18 | 2-6-18 | |
| Zinc | ND | 5.0 | EPA 200.8 | 2-5-18 | 2-6-18 | |



Date of Report: February 16, 2018
 Samples Submitted: January 29, 2018
 Laboratory Reference: 1801-296
 Project: 14-05806-000

**TOTAL METALS
 EPA 200.8
 QUALITY CONTROL**

Matrix: Water
 Units: ug/L (ppb)

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|---------------------|-----------|-----|-----------|---------------|---------------|-------|
| METHOD BLANK | | | | | | |
| Laboratory ID: | MB0205WH2 | | | | | |
| Copper | ND | 1.0 | EPA 200.8 | 2-5-18 | 2-6-18 | |
| Zinc | ND | 5.0 | EPA 200.8 | 2-5-18 | 2-6-18 | |

| Analyte | Result | Spike Level | Source Result | Percent Recovery | Recovery Limits | RPD | RPD Limit | Flags |
|------------------|-----------|-------------|---------------|------------------|-----------------|-----|-----------|-------|
| DUPLICATE | | | | | | | | |
| Laboratory ID: | 01-296-04 | | | | | | | |
| | ORIG | DUP | | | | | | |
| Copper | ND | ND | NA | NA | NA | NA | 20 | |
| Zinc | ND | ND | NA | NA | NA | NA | 20 | |

MATRIX SPIKES

| | | | | | | | | | | |
|----------------|-----------|------|-----|-----|----|----|-----|--------|---|----|
| Laboratory ID: | 01-296-04 | | | | | | | | | |
| | MS | MSD | MS | MSD | | MS | MSD | | | |
| Copper | 85.8 | 85.4 | 100 | 100 | ND | 86 | 85 | 75-125 | 0 | 20 |
| Zinc | 85.4 | 88.4 | 100 | 100 | ND | 85 | 88 | 75-125 | 3 | 20 |



Date of Report: February 16, 2018
 Samples Submitted: January 29, 2018
 Laboratory Reference: 1801-296
 Project: 14-05806-000

**DISSOLVED METALS
 EPA 200.8**

Matrix: Water
 Units: ug/L (ppb)

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|-------------------|----------------------|-----|-----------|---------------|---------------|-------|
| Client ID: | COLM-20180129 | | | | | |
| Laboratory ID: | 01-296-01 | | | | | |
| Copper | ND | 1.0 | EPA 200.8 | | 2-6-18 | |
| Zinc | ND | 5.0 | EPA 200.8 | | 2-6-18 | |

| | | | | | | |
|-------------------|-----------------------|-----|-----------|--|--------|--|
| Client ID: | COUMI-20180129 | | | | | |
| Laboratory ID: | 01-296-02 | | | | | |
| Copper | 1.3 | 1.0 | EPA 200.8 | | 2-7-18 | |
| Zinc | ND | 5.0 | EPA 200.8 | | 2-7-18 | |

| | | | | | | |
|-------------------|-----------------------|-----|-----------|--|--------|--|
| Client ID: | COUMO-20180129 | | | | | |
| Laboratory ID: | 01-296-03 | | | | | |
| Copper | 1.8 | 1.0 | EPA 200.8 | | 2-7-18 | |
| Zinc | 9.5 | 5.0 | EPA 200.8 | | 2-7-18 | |

| | | | | | | |
|-------------------|-----------------------|-----|-----------|--|--------|--|
| Client ID: | EVAMS-20180129 | | | | | |
| Laboratory ID: | 01-296-04 | | | | | |
| Copper | ND | 1.0 | EPA 200.8 | | 2-7-18 | |
| Zinc | ND | 5.0 | EPA 200.8 | | 2-7-18 | |

| | | | | | | |
|-------------------|------------------------|-----|-----------|--|--------|--|
| Client ID: | EVALSS-20180129 | | | | | |
| Laboratory ID: | 01-296-05 | | | | | |
| Copper | 5.6 | 1.0 | EPA 200.8 | | 2-7-18 | |
| Zinc | 5.3 | 5.0 | EPA 200.8 | | 2-7-18 | |

| | | | | | | |
|-------------------|-----------------------|-----|-----------|--|--------|--|
| Client ID: | MONMN-20180129 | | | | | |
| Laboratory ID: | 01-296-06 | | | | | |
| Copper | 1.0 | 1.0 | EPA 200.8 | | 2-7-18 | |
| Zinc | ND | 5.0 | EPA 200.8 | | 2-7-18 | |

| | | | | | | |
|-------------------|-----------------------|-----|-----------|--|--------|--|
| Client ID: | MONMS-20180129 | | | | | |
| Laboratory ID: | 01-296-07 | | | | | |
| Copper | 1.5 | 1.0 | EPA 200.8 | | 2-7-18 | |
| Zinc | ND | 5.0 | EPA 200.8 | | 2-7-18 | |



Date of Report: February 16, 2018
 Samples Submitted: January 29, 2018
 Laboratory Reference: 1801-296
 Project: 14-05806-000

DISSOLVED METALS
EPA 200.8

Matrix: Water
 Units: ug/L (ppb)

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|-------------------|----------------------|-----|-----------|---------------|---------------|-------|
| Client ID: | MONM-20180129 | | | | | |
| Laboratory ID: | 01-296-08 | | | | | |
| Copper | 1.0 | 1.0 | EPA 200.8 | | 2-7-18 | |
| Zinc | 6.0 | 5.0 | EPA 200.8 | | 2-7-18 | |

| | | | | | | |
|-------------------|-----------------------|-----|-----------|--|--------|--|
| Client ID: | SEIMN-20180129 | | | | | |
| Laboratory ID: | 01-296-09 | | | | | |
| Copper | ND | 1.0 | EPA 200.8 | | 2-7-18 | |
| Zinc | ND | 5.0 | EPA 200.8 | | 2-7-18 | |

| | | | | | | |
|-------------------|-----------------------|-----|-----------|--|--------|--|
| Client ID: | SEIMS-20180129 | | | | | |
| Laboratory ID: | 01-296-10 | | | | | |
| Copper | 23 | 1.0 | EPA 200.8 | | 2-7-18 | |
| Zinc | 17 | 5.0 | EPA 200.8 | | 2-7-18 | |

| | | | | | | |
|-------------------|-----------------------|-----|-----------|--|--------|--|
| Client ID: | TOSMI-20180129 | | | | | |
| Laboratory ID: | 01-296-11 | | | | | |
| Copper | 4.3 | 1.0 | EPA 200.8 | | 2-7-18 | |
| Zinc | 25 | 5.0 | EPA 200.8 | | 2-7-18 | |

| | | | | | | |
|-------------------|-----------------------|-----|-----------|--|--------|--|
| Client ID: | TOSMO-20180129 | | | | | |
| Laboratory ID: | 01-296-12 | | | | | |
| Copper | 3.2 | 1.0 | EPA 200.8 | | 2-7-18 | |
| Zinc | 18 | 5.0 | EPA 200.8 | | 2-7-18 | |

| | | | | | | |
|-------------------|-----------------------|-----|-----------|--|--------|--|
| Client ID: | TYLMI-20180129 | | | | | |
| Laboratory ID: | 01-296-13 | | | | | |
| Copper | 2.3 | 1.0 | EPA 200.8 | | 2-7-18 | |
| Zinc | 10 | 5.0 | EPA 200.8 | | 2-7-18 | |

| | | | | | | |
|-------------------|-----------------------|-----|-----------|--|--------|--|
| Client ID: | TYLMO-20180129 | | | | | |
| Laboratory ID: | 01-296-14 | | | | | |
| Copper | 2.0 | 1.0 | EPA 200.8 | | 2-7-18 | |
| Zinc | 5.5 | 5.0 | EPA 200.8 | | 2-7-18 | |



Date of Report: February 16, 2018
Samples Submitted: January 29, 2018
Laboratory Reference: 1801-296
Project: 14-05806-000

DISSOLVED METALS
EPA 200.8

Matrix: Water
Units: ug/L (ppb)

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|-------------------|----------------------|------------|---------------|----------------------|----------------------|--------------|
| Client ID: | QA42-20180129 | | | | | |
| Laboratory ID: | 01-296-15 | | | | | |
| Copper | 1.1 | 1.0 | EPA 200.8 | | 2-7-18 | |
| Zinc | ND | 5.0 | EPA 200.8 | | 2-7-18 | |



Date of Report: February 16, 2018
 Samples Submitted: January 29, 2018
 Laboratory Reference: 1801-296
 Project: 14-05806-000

**DISSOLVED METALS
 EPA 200.8
 QUALITY CONTROL**

Matrix: Water
 Units: ug/L (ppb)

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|---------------------|-----------|-----|-----------|---------------|---------------|-------|
| METHOD BLANK | | | | | | |
| Laboratory ID: | MB0206D2 | | | | | |
| Copper | ND | 1.0 | EPA 200.8 | | 2-6-18 | |
| Zinc | ND | 5.0 | EPA 200.8 | | 2-6-18 | |

| Analyte | Result | | Spike Level | | Source Result | Percent Recovery | Recovery Limits | RPD | RPD Limit | Flags |
|------------------|-----------|-----------|-------------|----|---------------|------------------|-----------------|-----|-----------|-------|
| DUPLICATE | | | | | | | | | | |
| Laboratory ID: | 01-296-01 | | | | | | | | | |
| | ORIG | DUP | | | | | | | | |
| Copper | ND | ND | NA | NA | | NA | NA | NA | 20 | |
| Zinc | ND | ND | NA | NA | | NA | NA | NA | 20 | |

MATRIX SPIKES

| | | | | | | | | | | |
|----------------|-------------|-------------|------|------|----|-----------|-----------|--------|---|----|
| Laboratory ID: | 01-296-01 | | | | | | | | | |
| | MS | MSD | MS | MSD | | MS | MSD | | | |
| Copper | 69.2 | 68.8 | 80.0 | 80.0 | ND | 87 | 86 | 75-125 | 1 | 20 |
| Zinc | 70.0 | 71.2 | 80.0 | 80.0 | ND | 88 | 89 | 75-125 | 2 | 20 |





Data Qualifiers and Abbreviations

- A - Due to a high sample concentration, the amount spiked is insufficient for meaningful MS/MSD recovery data.
 - B - The analyte indicated was also found in the blank sample.
 - C - The duplicate RPD is outside control limits due to high result variability when analyte concentrations are within five times the quantitation limit.
 - E - The value reported exceeds the quantitation range and is an estimate.
 - F - Surrogate recovery data is not available due to the high concentration of coeluting target compounds.
 - H - The analyte indicated is a common laboratory solvent and may have been introduced during sample preparation, and be impacting the sample result.
 - I - Compound recovery is outside of the control limits.
 - J - The value reported was below the practical quantitation limit. The value is an estimate.
 - K - Sample duplicate RPD is outside control limits due to sample inhomogeneity. The sample was re-extracted and re-analyzed with similar results.
 - L - The RPD is outside of the control limits.
 - M - Hydrocarbons in the gasoline range are impacting the diesel range result.
 - M1 - Hydrocarbons in the gasoline range (toluene-naphthalene) are present in the sample.
 - N - Hydrocarbons in the lube oil range are impacting the diesel range result.
 - N1 - Hydrocarbons in diesel range are impacting lube oil range results.
 - O - Hydrocarbons indicative of heavier fuels are present in the sample and are impacting the gasoline result.
 - P - The RPD of the detected concentrations between the two columns is greater than 40.
 - Q - Surrogate recovery is outside of the control limits.
 - S - Surrogate recovery data is not available due to the necessary dilution of the sample.
 - T - The sample chromatogram is not similar to a typical _____.
 - U - The analyte was analyzed for, but was not detected above the reported sample quantitation limit.
 - U1 - The practical quantitation limit is elevated due to interferences present in the sample.
 - V - Matrix Spike/Matrix Spike Duplicate recoveries are outside control limits due to matrix effects.
 - W - Matrix Spike/Matrix Spike Duplicate RPD are outside control limits due to matrix effects.
 - X - Sample extract treated with a mercury cleanup procedure.
 - X1 - Sample extract treated with a sulfuric acid/silica gel cleanup procedure.
 - Y - The calibration verification for this analyte exceeded the 20% drift specified in method 8260C, and therefore the reported result should be considered an estimate. The overall performance of the calibration verification standard met the acceptance criteria of the method.
 - Z -
- ND - Not Detected at PQL
 PQL - Practical Quantitation Limit
 RPD - Relative Percent Difference





Am Test Inc.
13600 NE 126TH PL
Suite C
Kirkland, WA 98034
(425) 885-1664

**Professional
Analytical
Services**

Feb 16 2018
On-Site Environmental
14648 NE 95th ST
Redmond, WA 98052
Attention: David Baumeister

Dear David Baumeister:

Enclosed please find the analytical data for your REDMOND PAIRED WATERSHED STUDY project.

The following is a cross correlation of client and laboratory identifications for your convenience.

| CLIENT ID | MATRIX | AMTEST ID | TEST |
|-----------------|--------|------------|------------|
| COLM-20180129 | Water | 18-A001708 | Micro, NUT |
| COUMI-20180129 | Water | 18-A001709 | Micro, NUT |
| COUMO-20180129 | Water | 18-A001710 | Micro, NUT |
| EVAMS-20180129 | Water | 18-A001711 | Micro, NUT |
| EVALSS-20180129 | Water | 18-A001712 | Micro, NUT |
| MONMN-20180129 | Water | 18-A001713 | Micro, NUT |
| MONMS-20180129 | Water | 18-A001714 | Micro, NUT |
| MONM-20180129 | Water | 18-A001715 | Micro, NUT |
| SEIMN-20180129 | Water | 18-A001716 | Micro, NUT |
| SEIMS-20180129 | Water | 18-A001717 | Micro, NUT |
| TOSMI-20180129 | Water | 18-A001718 | Micro, NUT |
| TOSMO-20180129 | Water | 18-A001719 | Micro, NUT |
| TYLMI-20180129 | Water | 18-A001720 | Micro, NUT |
| TYLMO-20180129 | Water | 18-A001721 | Micro, NUT |
| QA42-20180129 | Water | 18-A001722 | Micro, NUT |

Your samples were received on Monday, January 29, 2018. At the time of receipt, the samples were logged in and properly maintained prior to the subsequent analysis.

The analytical procedures used at AmTest are well documented and are typically derived from the protocols of the EPA, USDA, FDA or the Army Corps of Engineers.

Following the analytical data you will find the Quality Control (QC) results.

Please note that the detection limits that are listed in the body of the report refer to the Practical Quantitation Limits (PQL's), as opposed to the Method Detection Limits (MDL's).

Am Test Inc.
13600 NE 126TH PL
Suite C
Kirkland, WA 98034
(425) 885-1664

**Professional
Analytical
Services**

Feb 16 2018
On-Site Environmental
continued . . .

If you should have any questions pertaining to the data package, please feel free to contact me.

Sincerely,


Aaron W. Young
Laboratory Manager

Project #: 14-05806-000
PO Number: 01-296

BACT = Bacteriological
CONV = Conventional

MET = Metals
ORG = Organics

NUT=Nutrients
DEM=Demand

MIN=Minerals

Am Test Inc.
13600 NE 126TH PL
Suite C
Kirkland, WA 98034
(425) 885-1664
www.amtestlab.com



*Professional
Analytical
Services*

ANALYSIS REPORT

On-Site Environmental
14648 NE 95th ST
Redmond, WA 98052
Attention: David Baumeister
Project Name: REDMOND PAIRED WATERSHED STUDY
Project #: 14-05806-000
PO Number: 01-296
All results reported on an as received basis.

Date Received: 01/29/18
Date Reported: 2/16/18

AMTEST Identification Number 18-A001708
Client Identification COLM-20180129
Sampling Date 01/29/18, 13:05

Results

| PARAMETER | RESULT | UNITS | Q | D.L. | METHOD | ANALYST | DATE |
|--------------------------|--------|------------|---|------|-----------|---------|----------|
| Fecal Coliform | 10. | CFU/100 ml | | 1 | SM 9222D | JM | 01/29/18 |
| Total Nitrogen (NOX&TKN) | 0.56 | mg/l | | 0.1 | | | |
| Total Nitrogen (TKN) | 0.529 | mg/l | | 0.1 | SM4500N | JC | 02/07/18 |
| Nitrate + Nitrite | 0.034 | mg/l | | 0.01 | SM4500NO3 | JC | 02/01/18 |

AMTEST Identification Number **18-A001709**
Client Identification **COUMI-20180129**
Sampling Date **01/29/18, 10:55**

Results

| PARAMETER | RESULT | UNITS | Q | D.L. | METHOD | ANALYST | DATE |
|--------------------------|--------|------------|---|------|-----------|---------|----------|
| Fecal Coliform | 280 | CFU/100 ml | | 1 | SM 9222D | JM | 01/29/18 |
| Total Nitrogen (NOX&TKN) | 0.77 | mg/l | | 0.1 | | | |
| Total Nitrogen (TKN) | 0.479 | mg/l | | 0.1 | SM4500N | JC | 02/07/18 |
| Nitrate + Nitrite | 0.29 | mg/l | | 0.01 | SM4500NO3 | JC | 02/01/18 |

AMTEST Identification Number **18-A001710**
Client Identification **COUMO-20180129**
Sampling Date **01/29/18, 10:35**

Results

| PARAMETER | RESULT | UNITS | Q | D.L. | METHOD | ANALYST | DATE |
|--------------------------|--------|------------|---|------|-----------|---------|----------|
| Fecal Coliform | 410 | CFU/100 ml | | 1 | SM 9222D | JM | 01/29/18 |
| Total Nitrogen (NOX&TKN) | 1.00 | mg/l | | 0.1 | | | |
| Total Nitrogen (TKN) | 0.685 | mg/l | | 0.1 | SM4500N | JC | 02/07/18 |
| Nitrate + Nitrite | 0.32 | mg/l | | 0.01 | SM4500NO3 | JC | 02/01/18 |

AMTEST Identification Number 18-A001711
Client Identification EVAMS-20180129
Sampling Date 01/29/18, 11:15

Results

| PARAMETER | RESULT | UNITS | Q | D.L. | METHOD | ANALYST | DATE |
|--------------------------|--------|------------|---|------|-----------|---------|----------|
| Fecal Coliform | 35. | CFU/100 ml | | 1 | SM 9222D | JM | 01/29/18 |
| Total Nitrogen (NOX&TKN) | 2.14 | mg/l | | 0.1 | | | |
| Total Nitrogen (TKN) | 0.541 | mg/l | | 0.1 | SM4500N | JC | 02/07/18 |
| Nitrate + Nitrite | 1.6 | mg/l | | 0.01 | SM4500NO3 | JC | 02/01/18 |

AMTEST Identification Number 18-A001712
Client Identification EVALSS-20180129
Sampling Date 01/29/18, 11:35

Results

| PARAMETER | RESULT | UNITS | Q | D.L. | METHOD | ANALYST | DATE |
|--------------------------|--------|------------|---|------|-----------|---------|----------|
| Fecal Coliform | 20. | CFU/100 ml | | 1 | SM 9222D | JM | 01/29/18 |
| Total Nitrogen (NOX&TKN) | 1.77 | mg/l | | 0.1 | | | |
| Total Nitrogen (TKN) | 0.470 | mg/l | | 0.1 | SM4500N | JC | 02/07/18 |
| Nitrate + Nitrite | 1.3 | mg/l | | 0.01 | SM4500NO3 | JC | 02/01/18 |

AMTEST Identification Number **18-A001713**
Client Identification **MONMN-20180129**
Sampling Date **01/29/18, 12:10**

Results

| PARAMETER | RESULT | UNITS | Q | D.L. | METHOD | ANALYST | DATE |
|--------------------------|--------|------------|---|------|-----------|---------|----------|
| Fecal Coliform | 25. | CFU/100 ml | | 1 | SM 9222D | JM | 01/29/18 |
| Total Nitrogen (NOX&TKN) | 0.86 | mg/l | | 0.1 | | | |
| Total Nitrogen (TKN) | 0.446 | mg/l | | 0.1 | SM4500N | JC | 02/07/18 |
| Nitrate + Nitrite | 0.41 | mg/l | | 0.01 | SM4500NO3 | JC | 02/01/18 |

AMTEST Identification Number **18-A001714**
Client Identification **MONMS-20180129**
Sampling Date **01/29/18, 12:45**

Results

| PARAMETER | RESULT | UNITS | Q | D.L. | METHOD | ANALYST | DATE |
|--------------------------|--------|------------|---|------|-----------|---------|----------|
| Fecal Coliform | 70. | CFU/100 ml | | 1 | SM 9222D | JM | 01/29/18 |
| Total Nitrogen (NOX&TKN) | 1.00 | mg/l | | 0.1 | | | |
| Total Nitrogen (TKN) | 0.462 | mg/l | | 0.1 | SM4500N | JC | 02/07/18 |
| Nitrate + Nitrite | 0.54 | mg/l | | 0.01 | SM4500NO3 | JC | 02/01/18 |

AMTEST Identification Number 18-A001715
Client Identification MONM-20180129
Sampling Date 01/29/18, 13:55

Results

| PARAMETER | RESULT | UNITS | Q | D.L. | METHOD | ANALYST | DATE |
|--------------------------|--------|------------|---|------|-----------|---------|----------|
| Fecal Coliform | 120 | CFU/100 ml | | 1 | SM 9222D | JM | 01/29/18 |
| Total Nitrogen (NOX&TKN) | 0.94 | mg/l | | 0.1 | | | |
| Total Nitrogen (TKN) | 0.581 | mg/l | | 0.1 | SM4500N | JC | 02/07/18 |
| Nitrate + Nitrite | 0.36 | mg/l | | 0.01 | SM4500NO3 | JC | 02/01/18 |

AMTEST Identification Number 18-A001716
Client Identification SEIMN-20180129
Sampling Date 01/29/18, 12:25

Results

| PARAMETER | RESULT | UNITS | Q | D.L. | METHOD | ANALYST | DATE |
|--------------------------|--------|------------|---|------|-----------|---------|----------|
| Fecal Coliform | 55. | CFU/100 ml | | 1 | SM 9222D | JM | 01/29/18 |
| Total Nitrogen (NOX&TKN) | 0.57 | mg/l | | 0.1 | | | |
| Total Nitrogen (TKN) | 0.410 | mg/l | | 0.1 | SM4500N | JC | 02/07/18 |
| Nitrate + Nitrite | 0.16 | mg/l | | 0.01 | SM4500NO3 | JC | 02/01/18 |

AMTEST Identification Number 18-A001717
Client Identification SEIMS-20180129
Sampling Date 01/29/18, 13:20

Results

| PARAMETER | RESULT | UNITS | Q | D.L. | METHOD | ANALYST | DATE |
|--------------------------|--------|------------|---|------|-----------|---------|----------|
| Fecal Coliform | 5. | CFU/100 ml | | 1 | SM 9222D | JM | 01/29/18 |
| Total Nitrogen (NOX&TKN) | 0.74 | mg/l | | 0.1 | | | |
| Total Nitrogen (TKN) | 0.571 | mg/l | | 0.1 | SM4500N | JC | 02/07/18 |
| Nitrate + Nitrite | 0.17 | mg/l | | 0.01 | SM4500NO3 | JC | 02/01/18 |

AMTEST Identification Number 18-A001718
Client Identification TOSMI-20180129
Sampling Date 01/29/18, 10:40

Results

| PARAMETER | RESULT | UNITS | Q | D.L. | METHOD | ANALYST | DATE |
|--------------------------|--------|------------|---|------|-----------|---------|----------|
| Fecal Coliform | 1000 | CFU/100 ml | | 1 | SM 9222D | JM | 01/29/18 |
| Total Nitrogen (NOX&TKN) | 1.07 | mg/l | | 0.1 | | | |
| Total Nitrogen (TKN) | 0.699 | mg/l | | 0.1 | SM4500N | JC | 02/07/18 |
| Nitrate + Nitrite | 0.37 | mg/l | | 0.01 | SM4500NO3 | JC | 02/01/18 |

AMTEST Identification Number 18-A001719
Client Identification TOSMO-20180129
Sampling Date 01/29/18, 11:10

Results

| PARAMETER | RESULT | UNITS | Q | D.L. | METHOD | ANALYST | DATE |
|--------------------------|--------|------------|---|------|-----------|---------|----------|
| Fecal Coliform | 900 | CFU/100 ml | | 1 | SM 9222D | JM | 01/29/18 |
| Total Nitrogen (NOX&TKN) | 1.12 | mg/l | | 0.1 | | | |
| Total Nitrogen (TKN) | 0.641 | mg/l | | 0.1 | SM4500N | JC | 02/07/18 |
| Nitrate + Nitrite | 0.48 | mg/l | | 0.01 | SM4500NO3 | JC | 02/01/18 |

AMTEST Identification Number 18-A001720
Client Identification TYLMI-20180129
Sampling Date 01/29/18, 11:50

Results

| PARAMETER | RESULT | UNITS | Q | D.L. | METHOD | ANALYST | DATE |
|--------------------------|--------|------------|---|------|-----------|---------|----------|
| Fecal Coliform | 50. | CFU/100 ml | | 1 | SM 9222D | JM | 01/29/18 |
| Total Nitrogen (NOX&TKN) | 0.99 | mg/l | | 0.1 | | | |
| Total Nitrogen (TKN) | 0.547 | mg/l | | 0.1 | SM4500N | JC | 02/07/18 |
| Nitrate + Nitrite | 0.44 | mg/l | | 0.01 | SM4500NO3 | JC | 02/01/18 |

AMTEST Identification Number 18-A001721
Client Identification TYLMO-20180129
Sampling Date 01/29/18, 11:30


Results

| PARAMETER | RESULT | UNITS | Q | D.L. | METHOD | ANALYST | DATE |
|--------------------------|--------|------------|---|------|-----------|---------|----------|
| Fecal Coliform | 650 | CFU/100 ml | | 1 | SM 9222D | JM | 01/29/18 |
| Total Nitrogen (NOX&TKN) | 0.71 | mg/l | | 0.1 | | | |
| Total Nitrogen (TKN) | 0.479 | mg/l | | 0.1 | SM4500N | JC | 02/07/18 |
| Nitrate + Nitrite | 0.23 | mg/l | | 0.01 | SM4500NO3 | JC | 02/01/18 |

AMTEST Identification Number 18-A001722
Client Identification QA42-20180129
Sampling Date 01/29/18, 12:20

Results

| PARAMETER | RESULT | UNITS | Q | D.L. | METHOD | ANALYST | DATE |
|--------------------------|--------|------------|---|------|-----------|---------|----------|
| Fecal Coliform | 20. | CFU/100 ml | | 1 | SM 9222D | JM | 01/29/18 |
| Total Nitrogen (NOX&TKN) | 0.99 | mg/l | | 0.1 | | | |
| Total Nitrogen (TKN) | 0.631 | mg/l | | 0.1 | SM4500N | JC | 02/15/18 |
| Nitrate + Nitrite | 0.36 | mg/l | | 0.01 | SM4500NO3 | JC | 02/01/18 |


Aaron W. Young
Laboratory Manager

QC Summary for sample numbers: 18-A001708 to 18-A001722

DUPLICATES

| SAMPLE # | ANALYTE | UNITS | SAMPLE VALUE | DUP VALUE | RPD |
|------------|----------------------|------------|--------------|-----------|------|
| 18-A001707 | Fecal Coliform | CFU/100 ml | < 5 | < 5 | |
| 18-A001710 | Fecal Coliform | CFU/100 ml | 410 | 380 | 7.6 |
| 18-A001173 | Total Nitrogen (TKN) | mg/l | 0.481 | 0.402 | 18. |
| 18-A001714 | Total Nitrogen (TKN) | mg/l | 0.462 | 0.426 | 8.1 |
| 18-A001721 | Total Nitrogen (TKN) | mg/l | 0.479 | 0.400 | 18. |
| 18-A002188 | Total Nitrogen (TKN) | mg/l | 1.01 | 1.03 | 2.0 |
| 18-A001892 | Total Nitrogen (TKN) | mg/l | < 0.1 | < 0.1 | |
| 18-A002141 | Total Nitrogen (TKN) | mg/l | 36.0 | 41.2 | 13. |
| 18-A002151 | Total Nitrogen (TKN) | mg/l | 0.546 | 0.555 | 1.6 |
| 18-A002160 | Total Nitrogen (TKN) | mg/l | 0.503 | 0.440 | 13. |
| 18-A002470 | Total Nitrogen (TKN) | mg/l | 2.70 | 2.70 | 0.00 |
| 18-A001162 | Nitrate + Nitrite | mg/l | 2.3 | 2.2 | 4.4 |
| 18-A001172 | Nitrate + Nitrite | mg/l | 0.37 | 0.36 | 2.7 |
| 18-A001184 | Nitrate + Nitrite | mg/l | 0.35 | 0.33 | 5.9 |
| 18-A001197 | Nitrate + Nitrite | mg/l | 0.12 | 0.12 | 0.00 |
| 18-A001359 | Nitrate + Nitrite | mg/l | 0.42 | 0.41 | 2.4 |
| 18-A001369 | Nitrate + Nitrite | mg/l | 1.3 | 1.3 | 0.00 |
| 18-A001590 | Nitrate + Nitrite | mg/l | 0.47 | 0.46 | 2.2 |
| 18-A001712 | Nitrate + Nitrite | mg/l | 1.3 | 1.4 | 7.4 |
| 18-A001722 | Nitrate + Nitrite | mg/l | 0.36 | 0.36 | 0.00 |
| 18-A001770 | Nitrate + Nitrite | mg/l | 1.4 | 1.4 | 0.00 |
| 18-A001880 | Nitrate + Nitrite | mg/l | < 0.01 | < 0.01 | |
| 18-A001956 | Nitrate + Nitrite | mg/l | 39. | 43. | 9.8 |

MATRIX SPIKES

| SAMPLE # | ANALYTE | UNITS | SAMPLE VALUE | SMPL+ SPK | SPK AMT | RECOVERY |
|------------|----------------------|-------|--------------|-----------|---------|----------|
| 18-A001173 | Total Nitrogen (TKN) | mg/l | 0.481 | 2.44 | 2.00 | 97.95 % |
| 18-A001714 | Total Nitrogen (TKN) | mg/l | 0.462 | 2.41 | 2.00 | 97.40 % |
| 18-A001721 | Total Nitrogen (TKN) | mg/l | 0.479 | 2.36 | 2.00 | 94.05 % |
| 18-A002188 | Total Nitrogen (TKN) | mg/l | 1.01 | 2.98 | 2.00 | 98.50 % |
| 18-A001892 | Total Nitrogen (TKN) | mg/l | < 0.1 | 1.07 | 1.00 | 107.00 % |
| 18-A002141 | Total Nitrogen (TKN) | mg/l | 36.0 | 53.0 | 25.0 | 68.00 % |
| 18-A002151 | Total Nitrogen (TKN) | mg/l | 0.546 | 1.60 | 1.00 | 105.40 % |
| 18-A002160 | Total Nitrogen (TKN) | mg/l | 0.503 | 1.54 | 1.00 | 103.70 % |
| 18-A002470 | Total Nitrogen (TKN) | mg/l | 2.70 | 4.00 | 1.00 | 130.00 % |
| 18-A001162 | Nitrate + Nitrite | mg/l | 2.3 | 8.5 | 5.0 | 124.00 % |
| 18-A001172 | Nitrate + Nitrite | mg/l | 0.37 | 1.5 | 1.0 | 113.00 % |
| 18-A001184 | Nitrate + Nitrite | mg/l | 0.35 | 1.5 | 1.0 | 115.00 % |
| 18-A001197 | Nitrate + Nitrite | mg/l | 0.12 | 1.3 | 1.0 | 118.00 % |
| 18-A001359 | Nitrate + Nitrite | mg/l | 0.42 | 1.5 | 1.0 | 108.00 % |

QC Summary for sample numbers: 18-A001708 to 18-A001722...

MATRIX SPIKES continued....

| SAMPLE # | ANALYTE | UNITS | SAMPLE VALUE | SMPL+ SPK | SPK AMT | RECOVERY |
|------------|-------------------|-------|--------------|-----------|---------|----------|
| 18-A001369 | Nitrate + Nitrite | mg/l | 1.3 | 2.2 | 1.0 | 90.00 % |
| 18-A001590 | Nitrate + Nitrite | mg/l | 0.47 | 1.4 | 1.0 | 93.00 % |
| 18-A001712 | Nitrate + Nitrite | mg/l | 1.3 | 2.3 | 1.0 | 100.00 % |
| 18-A001722 | Nitrate + Nitrite | mg/l | 0.36 | 1.3 | 1.0 | 94.00 % |
| 18-A001770 | Nitrate + Nitrite | mg/l | 1.4 | 2.3 | 1.0 | 90.00 % |
| 18-A001880 | Nitrate + Nitrite | mg/l | < 0.01 | 0.96 | 1.0 | 96.00 % |
| 18-A001956 | Nitrate + Nitrite | mg/l | 39. | 57. | 20. | 90.00 % |

STANDARD REFERENCE MATERIALS

| ANALYTE | UNITS | TRUE VALUE | MEASURED VALUE | RECOVERY |
|----------------------|-------|------------|----------------|----------|
| Total Nitrogen (TKN) | mg/l | 1.00 | 0.931 | 93.1 % |
| Total Nitrogen (TKN) | mg/l | 1.00 | 0.965 | 96.5 % |
| Total Nitrogen (TKN) | mg/l | 1.00 | 0.931 | 93.1 % |
| Total Nitrogen (TKN) | mg/l | 1.00 | 1.01 | 101. % |
| Total Nitrogen (TKN) | mg/l | 1.00 | 1.01 | 101. % |
| Nitrate + Nitrite | mg/l | 1.0 | 1.0 | 100. % |
| Nitrate + Nitrite | mg/l | 1.0 | 1.0 | 100. % |
| Nitrate + Nitrite | mg/l | 1.0 | 1.0 | 100. % |
| Nitrate + Nitrite | mg/l | 1.0 | 0.97 | 97.0 % |
| Nitrate + Nitrite | mg/l | 1.0 | 0.99 | 99.0 % |

BLANKS

| ANALYTE | UNITS | RESULT |
|----------------------|------------|--------|
| Fecal Coliform | CFU/100 ml | < 1 |
| Fecal Coliform | CFU/100 ml | < 1 |
| Total Nitrogen (TKN) | mg/l | < 0.1 |
| Total Nitrogen (TKN) | mg/l | < 0.1 |
| Total Nitrogen (TKN) | mg/l | < 0.1 |
| Total Nitrogen (TKN) | mg/l | < 0.1 |
| Total Nitrogen (TKN) | mg/l | < 0.1 |
| Nitrate + Nitrite | mg/l | < 0.01 |
| Nitrate + Nitrite | mg/l | < 0.01 |
| Nitrate + Nitrite | mg/l | < 0.01 |
| Nitrate + Nitrite | mg/l | < 0.01 |
| Nitrate + Nitrite | mg/l | < 0.01 |



14648 NE 95th Street, Redmond, WA 98052 · (425) 883-3881

Laboratory Reference #: 01-296

Laboratory: AmTest Laboratories

Turnaround Request

Project Manager: Blair Goodrow

Attention: Aaron Young

1 Day 2 Day 3 Day

email: bgoodrow@onsite-env.com

13600 NE 126th PI Kirkland, WA 98034

Standard

Project Number: 14-05806-000

Phone Number: (425) 885-1664

Other: _____

Project Name: Redmond Paired Watershed Study

| Lab ID | Sample Identification | Date Sampled | Time Sampled | Matrix | # of Cont. | Requested Analyses |
|--------|-----------------------|--------------|--------------|--------|------------|---|
| 1 | COLM-20180129 1708 | 1/29/18 | 1305 | Water | 2 | Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N |
| 2 | COUMI-20180129 09 | 1/29/18 | 1055 | Water | 2 | Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N |
| 3 | COUMO-20180129 10 | 1/29/18 | 1035 | Water | 2 | Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N |
| 4 | EVAMS-20180129 11 | 1/29/18 | 1115 | Water | 2 | Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N |
| 5 | EVALSS-20180129 12 | 1/29/18 | 1135 | Water | 2 | Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N |
| 6 | MONMN-20180129 13 | 1/29/18 | 1210 | Water | 2 | Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N |
| 7 | MONMS-20180129 14 | 1/29/18 | 1245 | Water | 2 | Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N |
| 8 | MONM-20180129 15 | 1/29/18 | 1355 | Water | 2 | Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N |
| 9 | SEIMN-20180129 16 | 1/29/18 | 1225 | Water | 2 | Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N |
| 10 | SEIMS-20180129 17 | 1/29/18 | 1320 | Water | 2 | Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N |

| Signature | Company | Date | Time | Comments/Special Instructions |
|-------------------------|---------|---------|--------------|--|
| Relinquished by: | OBE | 1/29/18 | 1540 | EDDs - CSV Reporting Limits: Fecal Coliform - 1.0 cfu/100ml Total Nitrogen - .10 mg/L |
| Received by: Anna Stahl | AMTEST | T=7.0 | 1/29/18 3:40 | |
| Relinquished by: | | | | |
| Received by: | | | | |
| Relinquished by: | | | | |
| Received by: | | | | |



14648 NE 95th Street, Redmond, WA 98052 · (425) 883-3881

Laboratory Reference #: 01-296

Laboratory: AmTest Laboratories

Turnaround Request

Project Manager: Blair Goodrow

Attention: Aaron Young

1 Day 2 Day 3 Day

email: bgoodrow@onsite-env.com

13600 NE 126th PI Kirkland, WA 98034

Standard

Project Number: 14-05806-000

Phone Number: (425) 885-1664

Other: _____

Project Name: Redmond Paired Watershed Study

| Lab ID | Sample Identification | Date Sampled | Time Sampled | Matrix | # of Cont. | Requested Analyses |
|--------|----------------------------|--------------|--------------|--------|------------|---|
| 11 | TOSMI-20180129 <i>1718</i> | 1/29/18 | 1040 | Water | 2 | Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N |
| 12 | TOSMO-20180129 <i>19</i> | 1/29/18 | 1110 | Water | 2 | Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N |
| 13 | TYLMI-20180129 <i>20</i> | 1/29/18 | 1150 | Water | 2 | Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N |
| 14 | TYLMO-20180129 <i>21</i> | 1/29/18 | 1130 | Water | 2 | Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N |
| 15 | QA42-20180129 <i>22</i> | 1/29/18 | 1220 | Water | 2 | Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |

| Signature | Company | Date | Time | Comments/Special Instructions |
|-------------------------------------|---------------|----------------|-------------|---|
| Relinquished by: <i>[Signature]</i> | <i>OSRE</i> | <i>1/29/18</i> | <i>1:50</i> | EDDs - CSV Reporting Limits: Fecal Coliform - 1.0 cfu/100ml Total Nitrogen - .10 mg/L |
| Received by: <i>Alanna Staab</i> | <i>AMTEST</i> | <i>1/29/18</i> | <i>3:40</i> | |
| Relinquished by: | | | | |
| Received by: | | | | |
| Relinquished by: | | | | |
| Received by: | | | | |



14648 NE 95th Street, Redmond, WA 98052
Telephone: 425.883.3881

Company: Herrera Environmental Consultants
Project No.: 14-05806-000
Project Name: Redmond Paired Watershed Study
Project Manager: George Iftner

CHAIN OF CUSTODY

Turnaround Requested:

_____ 1 Day
_____ 2 Day
_____ 3 Day
 Standard

Laboratory No. **01-296**

Requested Analyses

| Total Suspended Solids (SM 2540D) | Turbidity (EPA 181.1) | Hardness (EPA 200.7 / SM 2340E) | Dissolved Organ Carbon (SM 5310B) * | Fecal Coliform (SM 9222D) | Total Phosphorus (EPA 365.1) | Total Nitrogen (SM 4500 N-B) | Total Cu and Zn (EPA 200.8) | Dissolved Cu and Zn (EPA 200.8) * |
|-----------------------------------|-----------------------|---------------------------------|-------------------------------------|---------------------------|------------------------------|------------------------------|-----------------------------|-----------------------------------|
|-----------------------------------|-----------------------|---------------------------------|-------------------------------------|---------------------------|------------------------------|------------------------------|-----------------------------|-----------------------------------|

| Lab ID | Sample Identification | Date Sampled | Time Sampled | Matrix | # of Cont. | Total Suspended Solids (SM 2540D) | Turbidity (EPA 181.1) | Hardness (EPA 200.7 / SM 2340E) | Dissolved Organ Carbon (SM 5310B) * | Fecal Coliform (SM 9222D) | Total Phosphorus (EPA 365.1) | Total Nitrogen (SM 4500 N-B) | Total Cu and Zn (EPA 200.8) | Dissolved Cu and Zn (EPA 200.8) * |
|--------|------------------------------------|--------------|------------------|--------|------------|-----------------------------------|-----------------------|---------------------------------|-------------------------------------|---------------------------|------------------------------|------------------------------|-----------------------------|-----------------------------------|
| 1 | COLM-20180129 | 1/29/18 | 13:05 | Water | 7 | X | X | X | X | X | X | X | X | X |
| 2 | COUMI-20180129 | | 10:55 | Water | 7 | X | X | X | X | X | X | X | X | X |
| 3 | COUMO-20180129 | | 10:35 | Water | 7 | X | X | X | X | X | X | X | X | X |
| 4 | EVAMS-2018 0129 | | 11:15 | Water | 7 | X | X | X | X | X | X | X | X | X |
| 5 | EVALSS-2018 0129 | | 11:35 | Water | 7 | X | X | X | X | X | X | X | X | X |
| 6 | MONMN-2018 0129 | | 12:10 | Water | 7 | X | X | X | X | X | X | X | X | X |
| 7 | MONMS-2018 0129 | | 12:45 | Water | 7 | X | X | X | X | X | X | X | X | X |
| 8 | MONM-2018 0129 | | 19:55 | Water | 7 | X | X | X | X | X | X | X | X | X |
| 9 | SEIMN-2018 0129 | | 12:25 | Water | 7 | X | X | X | X | X | X | X | X | X |
| 10 | SEIMS-2018 0129 | | 13:20 | Water | 7 | X | X | X | X | X | X | X | X | X |
| 11 | TOSMI-2018 0129 | | 10:40 | Water | 7 | X | X | X | X | X | X | X | X | X |
| 12 | TOSMO-2018 0129 | 11:10 | 11:30 | Water | 7 | X | X | X | X | X | X | X | X | X |
| 13 | TYLMI-2018 0129 | | 11:50 | Water | 7 | X | X | X | X | X | X | X | X | X |
| 14 | TYLMO-2018 0129 | | 11:30 | Water | 7 | X | X | X | X | X | X | X | X | X |
| 15 | QA 42 - 200 - 2018 0129 | | 12:20 | Water | 7 | X | X | X | X | X | X | X | X | X |

Relinquished by Herrera Date 1/29/18 Received by [Signature] Date 1/29/18
 Firm Herrera Time 14:23 Firm OSE Time 1423

Relinquished by _____ Date _____ Received by _____ Date _____
 Firm _____ Time _____ Firm _____ Time _____

Comments:
* - field filtered with 0.45 µm filter within 15 minutes of collecting sample



14648 NE 95th Street, Redmond, WA 98052
Telephone: 425.883.3881

Company: Herrera Environmental Consultants
Project No.: 14-05806-000
Project Name: Redmond Paired Watershed Study
Project Manager: George Iltner

Turnaround Requested:

_____ 1 Day
_____ 2 Day
_____ 3 Day
 Standard

CHAIN OF CUSTODY

Laboratory No. 01-209
Requested Analyses

| Total Suspended Solids (SM 2540D) | Turbidity (EPA 181.1) | Hardness (EPA 200.7 / SM 2340B) | Dissolved Organ Carbon (SM 5310B) * | Fecal Coliform (SM 9222D) | Total Phosphorus (EPA 365.1) | Total Nitrogen (SM 4500 N-B) | Total Cu and Zn (EPA 200.8) | Dissolved Cu and Zn (EPA 200.8) * |
|-----------------------------------|-----------------------|---------------------------------|-------------------------------------|---------------------------|------------------------------|------------------------------|-----------------------------|-----------------------------------|
|-----------------------------------|-----------------------|---------------------------------|-------------------------------------|---------------------------|------------------------------|------------------------------|-----------------------------|-----------------------------------|

| Lab ID | Sample Identification | Date Sampled | Time Sampled | Matrix | # of Cont. | Total Suspended Solids (SM 2540D) | Turbidity (EPA 181.1) | Hardness (EPA 200.7 / SM 2340B) | Dissolved Organ Carbon (SM 5310B) * | Fecal Coliform (SM 9222D) | Total Phosphorus (EPA 365.1) | Total Nitrogen (SM 4500 N-B) | Total Cu and Zn (EPA 200.8) | Dissolved Cu and Zn (EPA 200.8) * |
|--------|---------------------------------|--------------|------------------|--------|------------|-----------------------------------|-----------------------|---------------------------------|-------------------------------------|---------------------------|------------------------------|------------------------------|-----------------------------|-----------------------------------|
| 1 | COLM-20180129 | 1/29/18 | 13:05 | Water | 7 | X | X | X | X | X | X | X | X | X |
| 2 | COUMI-20180129 | | 10:55 | Water | 7 | X | X | X | X | X | X | X | X | X |
| 3 | COUMO-20180129 | | 10:35 | Water | 7 | X | X | X | X | X | X | X | X | X |
| 4 | EVAMS-20180129 | | 11:15 | Water | 7 | X | X | X | X | X | X | X | X | X |
| 5 | EVALSS-20180129 | | 11:35 | Water | 7 | X | X | X | X | X | X | X | X | X |
| 6 | MONMN-20180129 | | 12:10 | Water | 7 | X | X | X | X | X | X | X | X | X |
| 7 | MONMS-20180129 | | 12:45 | Water | 7 | X | X | X | X | X | X | X | X | X |
| 8 | MONM-20180129 | | 19:55 | Water | 7 | X | X | X | X | X | X | X | X | X |
| 9 | SEIMN-20180129 | | 12:25 | Water | 7 | X | X | X | X | X | X | X | X | X |
| 10 | SEIMS-20180129 | | 13:20 | Water | 7 | X | X | X | X | X | X | X | X | X |
| 11 | TOSMI-20180129 | | 10:40 | Water | 7 | X | X | X | X | X | X | X | X | X |
| 12 | TOSMO-20180129 | 11:10 | 12:30 | Water | 7 | X | X | X | X | X | X | X | X | X |
| 13 | TYLMI-20180129 | | 11:50 | Water | 7 | X | X | X | X | X | X | X | X | X |
| 14 | TYLMO-20180129 | | 11:30 | Water | 7 | X | X | X | X | X | X | X | X | X |
| 15 | QA 42- 000 -20180129 | | 12:20 | Water | 7 | X | X | X | X | X | X | X | X | X |

Relinquished by [Signature] Date 1/29/18 Received by [Signature] Date 1/29/18
 Firm Herrera Time 14:23 Firm OSE Time 1423

Relinquished by _____ Date _____ Received by _____ Date _____
 Firm _____ Time _____ Firm _____ Time _____

Comments:
* - field filtered with 0.45 µm filter within 15 minutes of collecting sample

METER CALIBRATION LOG - Redmond Paired Watershed Study



| | | | |
|-----------------------------------|---------------|-------|------|
| Project Number: | 14-05806-000 | | |
| Personnel Performing Calibration: | A. SWENSON | | |
| Meter: | YSI ProDSS #1 | | |
| Date/Time: | 1/29/18 0930 | | |
| Barometric Pressure Start of Day: | mmHg: 752.9 | Time: | 0930 |
| Barometric Pressure End of Day: | mmHg: 754.5 | Time: | 1520 |

Calibration Procedures:

Rinse Multimter Sonde Between Each Operation

Rinse 3 times with tap water, 3 times with deionized water, then 3 times with the solution to be used for calibrating or testing.

Conductivity Calibration Notes:

1. Dry the conductivity probe with a lab tissue (e.g., KimWipes®) and DI water.
2. Fill calibration cup to within a centimeter of the top of the calibration cup with DI water (0 µS).
3. Fill the calibration cup with 1,000 µS standard so that the temperature/conductivity probe is submerged.
4. Make sure there are no bubbles in the cell; wait 2 minutes.
5. Enter the appropriate standard value (1,000 µS/cm or 1.0 mS/cm) for Sp Cond.
6. Check conductivity using 100 µS/cm standard.

Dissolved Oxygen Calibration Notes:

1. Fill the calibration cup with about 1/2 inch of DI; it should be below the sensor cap.
2. Use KimWipes® to dry any droplets from the sensor cap.
3. Invert calibration cup's cap and gently rest it on the cup.
4. Wait 5 minutes, making sure that temperature stabilizes.
5. Determine local barometric pressure (mm Hg) and enter this value into the meter.
6. Click "Calibrate". "Calibrate Successful" will be displayed.
7. To retain calibration accuracy between measurements, store with the sensor immersed in water or within a water-saturated air environment such as a sealed storage cup with at least 10 ml of water.
8. It is important to have the water-saturated air and the sensor at the same temperature. Therefore, store a jar of DI in the same environment as the sonde and calibrate in a similar air temperature as the water and sonde.
9. Keep probe out of direct sun or wind.

| PRE Field Run CALIBRATION | Meter Reading | Buffer / Cal Std | Temp °C | Comments |
|---------------------------|---------------|------------------|---------|-----------------------------------|
| Conductivity (µS/cm) | 8.5 | 0 | 22.0 | |
| Conductivity (µS/cm) | 999 | 1,000 | 21.9 | |
| Conductivity (µS/cm) | 100.0 | 100 | 21.9 | |
| DO % Saturation | 100.4 | 100 | 22.1 | CALIBRATION READ 100.0% AFTER CAL |

| POST Field Run CHECK | Meter Reading | Buffer / Cal Std | Temp °C | Comments |
|----------------------|---------------|------------------|---------|--------------------|
| Conductivity (µS/cm) | 9.6 | 0 | 22.5 | |
| Conductivity (µS/cm) | 999 | 1,000 | 22.7 | Rin out of 100µS/L |
| DO % Saturation | 100.2 | 100 | 17.3 | |

METER CALIBRATION LOG - Redmond Paired Watershed Study

| | | | |
|-----------------------------------|---------------|-------|------|
| Project Number: | 14-05806-000 | | |
| Personnel Performing Calibration: | A. SUNDSEW | | |
| Meter: | YSI ProDSS #2 | | |
| Date/Time: | 1/29/18 0930 | | |
| Barometric Pressure Start of Day: | mmHg: 759.6 | Time: | 0930 |
| Barometric Pressure End of Day: | mmHg: 755.2 | Time: | 1520 |

Calibration Procedures:

Rinse Multimeter Sonde Between Each Operation

Rinse 3 times with tap water, 3 times with deionized water, then 3 times with the solution to be used for calibrating or testing.

Conductivity Calibration Notes:

1. Dry the conductivity probe with a lab tissue (e.g., KimWipes®) and DI water.
2. Fill calibration cup to within a centimeter of the top of the calibration cup with DI water (0 µS).
3. Fill the calibration cup with 1,000 µS standard so that the temperature/conductivity probe is submerged.
4. Make sure there are no bubbles in the cell; wait 2 minutes.
5. Enter the appropriate standard value (1,000 µS/cm or 1.0 mS/cm) for Sp Cond.
6. Check conductivity using 100 µS/cm standard.

Dissolved Oxygen Calibration Notes:

1. Fill the calibration cup with about 1/2 inch of DI; it should be below the sensor cap.
2. Use KimWipes® to dry any droplets from the sensor cap.
3. Invert calibration cup's cap and gently rest it on the cup.
4. Wait 5 minutes, making sure that temperature stabilizes.
5. Determine local barometric pressure (mm Hg) and enter this value into the meter.
6. Click "Calibrate". "Calibrate Successful" will be displayed.
7. To retain calibration accuracy between measurements, store with the sensor immersed in water or within a water-saturated air environment such as a sealed storage cup with at least 10 ml of water.
8. It is important to have the water-saturated air and the sensor at the same temperature. Therefore, store a jar of DI in the same environment as the sonde and calibrate in a similar air temperature as the water and sonde.
9. Keep probe out of direct sun or wind.



| PRE Field Run CALIBRATION | Meter Reading | Buffer / Cal Std | Temp °C | Comments |
|---------------------------|---------------|------------------|---------|-----------------------------------|
| Conductivity (µS/cm) | 9.4 | 0 | 22.2 | |
| Conductivity (µS/cm) | 1,000 | 1,000 | 22.0 | |
| Conductivity (µS/cm) | 106.0 | 100 | 22.3 | |
| DO % Saturation | 99.8 | 100 | 22.3 | READS 100.0% DO AFTER CALIBRATION |

| POST Field Run CHECK | Meter Reading | Buffer / Cal Std | Temp °C | Comments |
|----------------------|---------------|------------------|---------|-------------------------|
| Conductivity (µS/cm) | 8.2 | 0 | 22.2° | |
| Conductivity (µS/cm) | 99.5 | 1,000 | 22.7 | Run out of 1,000 µS std |
| DO % Saturation | 99.5 | 100 | 16.5 | |

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: M. Mulla J. Long

Sample Date: 1/29/18

Sample Time: 13:05

PDT:

SITE ID: COLM

Base Flow or Storm Event? Base Flow

Field Filtered Time: 13:10

PST:

Project Number: 14-05806-000

(Must filter within 15 minutes of collection)



Water Quality Sampling

Sample ID: COLM-20180129

Project Name: Redmond Paired Watershed Study

Current Weather and Temp: rainy 42°

| Parameter | Bottle Type | Bottle Volume | # Bottles | Preservative | Duplicated? |
|---------------------------|-------------|---------------|-----------|--------------------------------|-------------|
| TSS and Turbidity | HDPE | 1L | 1 | NA | <u>no</u> |
| DOC * | HDPE | 250 ml | 1 | HCL | |
| Fecal Col. Bact. | HDPE | 250 ml | 1 | EDTA | |
| T. Phosphorous | HDPE | 250 ml | 1 | H ₂ SO ₄ | |
| T. Nitrogen | HDPE | 250 ml | 1 | H ₂ SO ₄ | |
| Diss. Cu and Zn * | HDPE | 250 ml | 1 | HNO ₃ | |
| Hardness, Total Cu and Zn | HDPE | 500 ml | 1 | HNO ₃ | |

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID:

Filter blank sample ID:

Transfer blank sample ID:

Visual and Olfactory Conditions:

Clarity: clear

Color: yellow

Odor: none

Sheen: none

Floatables: foam

LABORATORY DELIVERY.

Date:

Time:

Quality Assurance

Checked By: S. Smith

Signature: [Signature]

Date Checked: 2-10-18

Time:

Data Entered into Database?

YES

NO

initials:

Date Entered:

Time:

Notes:

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

YSI Pro Plus (15D100020)

YSI Pro DSS 1

YSI Pro DSS 2

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): 6.85 5.85

Reference Point (description): SG

Water Quality Measurements

Temperature (°C) 5.9°

Specific Conductivity (µs/cm) 26.8

Dissolved Oxygen (mg/L) 11.28

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: AS/VW

SITE ID: COUMI

Sample Date: 1/29/18

Sample Time: 1055

PDT:

Base Flow or Storm Event? (circled)

Field Filtered Time: 1100

PST:

Project Number: 14-05806-000

(Must filter within 15 minutes of collection)



HERRERA

Project Name: Redmond Paired Watershed Study

Water Quality Sampling

Sample ID: COUMI-20180129

Current Weather and Temp: STEADY RAIN, 46°F

| Parameter | Bottle Type | Bottle Volume | # Bottles | Preservative | Duplicated? |
|---------------------------|-------------|---------------|-----------|--------------------------------|-------------|
| TSS and Turbidity | HDPE | 1L | 1 | NA | <u>N</u> |
| DOC * | HDPE | 250 ml | 1 | HCL | ↓ |
| Fecal Col. Bact. | HDPE | 250 ml | 1 | EDTA | |
| T. Phosphorous | HDPE | 250 ml | 1 | H ₂ SO ₄ | |
| T. Nitrogen | HDPE | 250 ml | 1 | H ₂ SO ₄ | |
| Diss. Cu and Zn * | HDPE | 250 ml | 1 | HNO ₃ | |
| Hardness, Total Cu and Zn | HDPE | 500 ml | 1 | HNO ₃ | |
| | | | | | |

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID:

Filter blank sample ID:

Transfer blank sample ID:

Visual and Olfactory Conditions:

Clarity: SLIGHTLY TURBID
 Color: NONE
 Odor: NONE
 Sheen: ↓
 Floatables: ↓

LABORATORY DELIVERY

Date:

Time:

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

YSI Pro Plus (15D100020)

YSI Pro DSS 1

YSI Pro DSS 2 X

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): 2.79

Reference Point (description): S.G.

Water Quality Measurements

Temperature (°C) 8.1

Specific Conductivity (µs/cm) 133.5

Dissolved Oxygen (mg/L) 11.60

Quality Assurance

Checked By: S. Lenth

Signature: [Signature]

Date Checked: 2-16-18

Time:

Data Entered into Database?

YES

NO

initials:

Date Entered:

Time:

Notes:

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: A. SVENDSEN / V. WU

Sample Date: 1/29/18

Sample Time: 1035

PDT:

SITE ID: COUMO-

Base Flow or Storm Event? (circled)

Field Filtered Time: 1040

PST:

Project Number: 14-05806-000



HERRERA

Project Name: Redmond Paired Watershed Study

Water Quality Sampling

Sample ID: COUMO-20180129

| Parameter | Bottle Type | Bottle Volume | # Bottles | Preservative | Duplicated? |
|---------------------------|-------------|---------------|-----------|--------------------------------|-------------|
| TSS and Turbidity | HDPE | 1L | 1 | NA | N |
| DOC * | HDPE | 250 ml | 1 | HCL | |
| Fecal Col. Bact. | HDPE | 250 ml | 1 | EDTA | |
| T. Phosphorous | HDPE | 250 ml | 1 | H ₂ SO ₄ | |
| T. Nitrogen | HDPE | 250 ml | 1 | H ₂ SO ₄ | |
| Diss. Cu and Zn * | HDPE | 250 ml | 1 | HNO ₃ | |
| Hardness, Total Cu and Zn | HDPE | 500 ml | 1 | HNO ₃ | Y |

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID: _____

Filter blank sample ID: _____

Transfer blank sample ID: _____

Visual and Olfactory Conditions:

Clarity: SLIGHTLY TURBID

Color: NONE

Odor: _____

Sheen: _____

Floatables: Y

LABORATORY DELIVERY

Date: _____

Time: _____

Quality Assurance

Checked By: S. Lenth

Signature: [Signature]

Date Checked: 2-16-18

Time: _____

Data Entered into Database? _____

YES NO initials:

Date Entered: _____

Time: _____

Notes: _____

Current Weather and Temp: STEADY RAIN, 46°F

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

YSI Pro Plus (15D100020) _____

YSI Pro DSS 1 _____

YSI Pro DSS 2 X

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): 1.46

Reference Point (description): S.G.

Water Quality Measurements

Temperature (°C) 8.2

Specific Conductivity (µs/cm) 121.3

Dissolved Oxygen (mg/L) 11.44

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: M. M. [unclear] & George
 Sample Date: 1/29/18 Sample Time: 11:15 PDT:
 Base Flow or Storm Event? Field Filtered Time: 11:20 PST:
(Must filter within 15 minutes of collection)

SITE ID: EVAMS
 Project Number: 14-05806-000



Water Quality Sampling

Sample ID: EVAMS - 20180129

| Parameter | Bottle Type | Bottle Volume | # Bottles | Preservative | Duplicated? |
|---------------------------|-------------|---------------|-----------|--------------------------------|-------------|
| TSS and Turbidity | HDPE | 1L | 1 | NA | 10 |
| DOC * | HDPE | 250 ml | 1 | HCL | ↓ |
| Fecal Col. Bact. | HDPE | 250 ml | 1 | EDTA | |
| T. Phosphorous | HDPE | 250 ml | 1 | H ₂ SO ₄ | |
| T. Nitrogen | HDPE | 250 ml | 1 | H ₂ SO ₄ | |
| Diss. Cu and Zn * | HDPE | 250 ml | 1 | HNO ₃ | |
| Hardness, Total Cu and Zn | HDPE | 500 ml | 1 | HNO ₃ | |

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID: _____
 Filter blank sample ID: _____
 Transfer blank sample ID: _____

Visual and Olfactory Conditions:

Clarity: clear
 Color: none
 Odor: none
 Sheen: none
 Floatables: none

LABORATORY DELIVERY

Date: _____ Time: _____

Quality Assurance

Checked By: S. L. [unclear] Signature: _____
 Date Checked: 2-10-18 Time: _____
 Data Entered into Database? YES NO initials: _____
 Date Entered: _____ Time: _____
 Notes: _____

Project Name: Redmond Paired Watershed Study

Current Weather and Temp: windy 45°

Field Meter Calibration

Check which field meter was used and complete the meter calibration form
 YSI Pro Plus (15D100020) _____
 YSI Pro DSS 1 _____
 YSI Pro DSS 2 _____

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)
 Stream Stage (ft): 3.95
 Reference Point (description): 86

Water Quality Measurements

Temperature (°C) 7.7°
 Specific Conductivity (µs/cm) 163.0
 Dissolved Oxygen (mg/L) 11.49

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: M. Walker & J. G...

Sample Date: 1/29/18

Sample Time: 11:35

PDT:

SITE ID: EWASS

Base Flow or Storm Event? Storm

Field Filtered Time: 11:40

PST:

Project Number: 14-05806-000

(Must filter within 15 minutes of collection)



HERRERA

Water Quality Sampling

Sample ID: EWASS-20180129

| Parameter | Bottle Type | Bottle Volume | # Bottles | Preservative | Duplicated? |
|---------------------------|-------------|---------------|-----------|--------------------------------|-------------|
| TSS and Turbidity | HDPE | 1L | 1 | NA | <u>NO</u> |
| DOC * | HDPE | 250 ml | 1 | HCL | |
| Fecal Col. Bact. | HDPE | 250 ml | 1 | EDTA | |
| T. Phosphorous | HDPE | 250 ml | 1 | H ₂ SO ₄ | |
| T. Nitrogen | HDPE | 250 ml | 1 | H ₂ SO ₄ | |
| Diss. Cu and Zn * | HDPE | 250 ml | 1 | HNO ₃ | |
| Hardness, Total Cu and Zn | HDPE | 500 ml | 1 | HNO ₃ | |

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID:

Filter blank sample ID:

Transfer blank sample ID:

Visual and Olfactory Conditions:

Clarity: clear

Color: none

Odor: none

Sheen: none

Floatables: none

LABORATORY DELIVERY

Date:

Time:

Quality Assurance

Checked By: S. Leuth

Signature: [Signature]

Date Checked: 2-16-18

Time:

Data Entered into Database?

YES

NO

initials:

Date Entered:

Time:

Notes:

Project Name: Redmond Paired Watershed Study

Current Weather and Temp: rainy 42°

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

YSI Pro Plus (15D100020)

YSI Pro DSS 1

YSI Pro DSS 2

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): 2.36

Reference Point (description): 36

Water Quality Measurements

Temperature (°C) 10 8.0°

Specific Conductivity (µs/cm) 155.3

Dissolved Oxygen (mg/L) 11.71

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: AS/VW
 Sample Date: 1/29/18 Sample Time: 1210 PDT:
 Base Flow or Storm Event? Field Filtered Time: 1215 PST:
 (Must filter within 15 minutes of collection)

SITE ID: MONMN
 Project Number: 14-05806-000



Project Name: Redmond Paired Watershed Study
 Current Weather and Temp: LIGHT RAIN, 48°F

Water Quality Sampling

Sample ID: MONMN-20180129

| Parameter | Bottle Type | Bottle Volume | # Bottles | Preservative | Duplicated? |
|---------------------------|-------------|---------------|-----------|--------------------------------|-------------|
| TSS and Turbidity | HDPE | 1L | 1 | NA | Y |
| DOC * | HDPE | 250 ml | 1 | HCL | ↓ |
| Focal Col. Bact. | HDPE | 250 ml | 1 | EDTA | ↓ |
| T. Phosphorous | HDPE | 250 ml | 1 | H ₂ SO ₄ | ↓ |
| T. Nitrogen | HDPE | 250 ml | 1 | H ₂ SO ₄ | ↓ |
| Diss. Cu and Zn * | HDPE | 250 ml | 1 | HNO ₃ | ↓ |
| Hardness, Total Cu and Zn | HDPE | 500 ml | 1 | HNO ₃ | ↓ |

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID: QA42-20180129 11220
 Filter blank sample ID:
 Transfer blank sample ID:

Visual and Olfactory Conditions:

Clarity: SLIGHTLY TURBID
 Color: NONE
 Odor:
 Sheen:
 Floatables:

LABORATORY DELIVERY

Date: Time:

Quality Assurance

Checked By: S. Leuth Signature: [Signature]
 Date Checked: 2-16-18 Time:
 Data Entered into Database? YES NO initials:
 Date Entered: Time:
 Notes:

Field Meter Calibration

Check which field meter was used and complete the meter calibration form
YSI Pro Plus (15D100020)
YSI Pro DSS 1
YSI Pro DSS 2 X

Stream/Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)
 Stream Stage (ft): ~~40.29~~ 9.29
 Reference Point (description): S.G.

Water Quality Measurements

Temperature (°C) 7.6
 Specific Conductivity (µs/cm) 120.3
 Dissolved Oxygen (mg/L) 11.52

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: AS/VW
 Sample Date: 1/29/18 Sample Time: 1245 PDT:
 Base Flow or Storm Event? (circled) Field Filtered Time: 1250 PST:
 (Must filter within 15 minutes of collection)

SITE ID: MONMS
 Project Number: 14-05806-000



Project Name: Redmond Paired Watershed Study
 Current Weather and Temp: LIGHT RAIN, 49°F

Water Quality Sampling

Sample ID: MONMS-20180129

| Parameter | Bottle Type | Bottle Volume | # Bottles | Preservative | Duplicated? |
|---------------------------|-------------|---------------|-----------|--------------------------------|-------------|
| TSS and Turbidity | HDPE | 1L | 1 | NA | N |
| DOC * | HDPE | 250 ml | 1 | HCL | ↓ |
| Fecal Col. Bact. | HDPE | 250 ml | 1 | EDTA | |
| T. Phosphorous | HDPE | 250 ml | 1 | H ₂ SO ₄ | |
| T. Nitrogen | HDPE | 250 ml | 1 | H ₂ SO ₄ | |
| Diss. Cu and Zn * | HDPE | 250 ml | 1 | HNO ₃ | |
| Hardness, Total Cu and Zn | HDPE | 500 ml | 1 | HNO ₃ | |

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID: ---
 Filter blank sample ID: ---
 Transfer blank sample ID: ---

Visual and Olfactory Conditions:

Clarity: CLEAR
 Color: NONE
 Odor: ↓
 Sheen: ↓
 Floatables: ↓

LABORATORY DELIVERY

Date: _____ Time: _____

Quality Assurance

Checked By: S. Lenth Signature: [Signature]
 Date Checked: 2-10-18 Time: _____
 Data Entered into Database? YES NO initials:
 Date Entered: _____ Time: _____
 Notes: _____

Field Meter Calibration

Check which field meter was used and complete the meter calibration form
YSI Pro Plus (15D100020)
YSI Pro DSS 1
YSI Pro DSS 2 X

Stream/Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): 10.11
 Reference Point (description): W.C.I./D.T.W./PVC STIPEL WEA

Water Quality Measurements

Temperature (°C) 8.2
 Specific Conductivity (µs/cm) 201.9
 Dissolved Oxygen (mg/L) 10.10

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: M. Miller J. Goy
 Sample Date: 1/29/18 Sample Time: 13:55 PDT:
 Base Flow or Storm Event? Field Filtered Time: 14:00 PST:
(Must filter within 15 minutes of collection)

SITE ID: MONM
 Project Number: 14-05806-000



Project Name: Redmond Paired Watershed Study
 Current Weather and Temp: rainy 41°

Water Quality Sampling

Sample ID: MONM-20180129

| Parameter | Bottle Type | Bottle Volume | # Bottles | Preservative | Duplicated? |
|---------------------------|-------------|---------------|-----------|--------------------------------|-------------|
| TSS and Turbidity | HDPE | 1L | 1 | NA | No |
| DOC * | HDPE | 250 ml | 1 | HCL | ↓ |
| Fecal Col. Bact. | HDPE | 250 ml | 1 | EDTA | |
| T. Phosphorous | HDPE | 250 ml | 1 | H ₂ SO ₄ | |
| T. Nitrogen | HDPE | 250 ml | 1 | H ₂ SO ₄ | |
| Diss. Cu and Zn * | HDPE | 250 ml | 1 | HNO ₃ | ↓ |
| Hardness, Total Cu and Zn | HDPE | 500 ml | 1 | HNO ₃ | |

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID: _____
 Filter blank sample ID: _____
 Transfer blank sample ID: _____

Visual and Olfactory Conditions:

Clarity: clear
 Color: yellow
 Odor: none
 Sheen: none
 Floatables: none

LABORATORY DELIVERY

Date: _____ Time: _____

Quality Assurance

Checked By: J. Goy Signature: [Signature]
 Date Checked: 2-16-18 Time: _____
 Data Entered into Database? YES NO initials: _____
 Date Entered: _____ Time: _____
 Notes: _____

Field Meter Calibration

Check which field meter was used and complete the meter calibration form
 YSI Pro Plus (15D100020) _____
 YSI Pro DSS 1 _____
 YSI Pro DSS 2 _____

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)
 Stream Stage (ft): N/A
 Reference Point (description): _____

Water Quality Measurements

Temperature (°C) 7.7°
 Specific Conductivity (µs/cm) 136.3
 Dissolved Oxygen (mg/L) 11.70

FIELD SAMPLING SHEET - Redmond Paired Watershed Study



Field Personnel: M. Miller & G. Goy
 Sample Date: 1/29/18 Sample Time: 12:25 PDT:
 Base Flow or Storm Event? Field Filtered Time: 12:30 PST:
(Must filter within 15 minutes of collection)

SITE ID: SEIMN
 Project Number: 14-05806-000

Project Name: Redmond Paired Watershed Study
 Current Weather and Temp: rainy 92°

Water Quality Sampling

Sample ID: SEIMN-20180129

| Parameter | Bottle Type | Bottle Volume | # Bottles | Preservative | Duplicated? |
|---------------------------|-------------|---------------|-----------|--------------------------------|-------------|
| TSS and Turbidity | HDPE | 1L | 1 | NA | NO |
| DOC * | HDPE | 250 ml | 1 | HCL | ↓ |
| Fecal Col. Bact. | HDPE | 250 ml | 1 | EDTA | |
| T. Phosphorous | HDPE | 250 ml | 1 | H ₂ SO ₄ | |
| T. Nitrogen | HDPE | 250 ml | 1 | H ₂ SO ₄ | |
| Diss. Cu and Zn * | HDPE | 250 ml | 1 | HNO ₃ | |
| Hardness, Total Cu and Zn | HDPE | 500 ml | 1 | HNO ₃ | |

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID: _____
 Filter blank sample ID: _____
 Transfer blank sample ID: _____

Visual and Olfactory Conditions:

Clarity: clear
 Color: none
 Odor: none
 Sheen: none
 Floatables: foam

LABORATORY DELIVERY

Date: _____ Time: _____

Quality Assurance

Checked By: J. Leuth Signature: [Signature]
 Date Checked: 2-16-18 Time: _____
 Data Entered into Database? YES NO initials: _____
 Date Entered: _____ Time: _____
 Notes: _____

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

YSI Pro Plus (15D100020) _____
 YSI Pro DSS 1 _____
 YSI Pro DSS 2 _____

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): 0.75
 Reference Point (description): Top of bank

Water Quality Measurements

Temperature (°C) 7.1°
 Specific Conductivity (µs/cm) 48.4
 Dissolved Oxygen (mg/L) 11.80

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: AS/VW

Sample Date: 1/29/18

Sample Time: 1320

PDT:

SITE ID: SEIMS

Base Flow or Storm Event? (circled)

Field Filtered Time: 1325

PST:

Project Number: 14-05806-000



HERRERA

Project Name: Redmond Paired Watershed Study

Current Weather and Temp: STEADY RAIN, 48°F

Water Quality Sampling

Sample ID: SEIMS-20180129

| Parameter | Bottle Type | Bottle Volume | # Bottles | Preservative | Duplicated? |
|---------------------------|-------------|---------------|-----------|--------------------------------|-------------|
| TSS and Turbidity | HDPE | 1L | 1 | NA | N |
| DOC * | HDPE | 250 ml | 1 | HCL | ↓ |
| Fecal Col. Bact. | HDPE | 250 ml | 1 | EDTA | |
| T. Phosphorous | HDPE | 250 ml | 1 | H ₂ SO ₄ | |
| T. Nitrogen | HDPE | 250 ml | 1 | H ₂ SO ₄ | |
| Diss. Cu and Zn * | HDPE | 250 ml | 1 | HNO ₃ | |
| Hardness, Total Cu and Zn | HDPE | 500 ml | 1 | HNO ₃ | |

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID: _____

Filter blank sample ID: _____

Transfer blank sample ID: _____

Visual and Olfactory Conditions:

Clarity: _____

Color: _____

Odor: _____

Sheen: _____

Floatables: _____

LABORATORY DELIVERY

Date: _____

Time: _____

Quality Assurance

Checked By: J. Leuth

Signature: [Signature]

Date Checked: 2-10-18

Time: _____

Data Entered into Database? _____

YES

NO

initials: _____

Date Entered: _____

Time: _____

Notes: _____

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

YSI Pro Plus (15D100020)

YSI Pro DSS 1

YSI Pro DSS 2 X

Stream/Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): 0.87

Reference Point (description): S-6

Water Quality Measurements

Temperature (°C) 7.7

Specific Conductivity (µs/cm) 78.3

Dissolved Oxygen (mg/L) 11.21

FIELD SAMPLING SHEET - Redmond Paired Watershed Study



Field Personnel: M. Miller, J. Gogel
 Sample Date: 2018/01/29 Sample Time: 10:40 PDT:
 Base Flow or Storm Event? Field Filtered Time: 10:45 PST:
(Must filter within 15 minutes of collection)

SITE ID: TOSMI
 Project Number: 14-05806-000

Project Name: Redmond Paired Watershed Study
 Current Weather and Temp: rainy 41°

Water Quality Sampling

Sample ID: TOSMI-20180129

| Parameter | Bottle Type | Bottle Volume | # Bottles | Preservative | Duplicated? |
|---------------------------|-------------|---------------|-----------|--------------------------------|-------------|
| TSS and Turbidity | HDPE | 1L | 1 | NA | NO |
| DOC * | HDPE | 250 ml | 1 | HCL | ↓ |
| Fecal Col. Bact. | HDPE | 250 ml | 1 | EDTA | ↓ |
| T. Phosphorous | HDPE | 250 ml | 1 | H ₂ SO ₄ | ↓ |
| T. Nitrogen | HDPE | 250 ml | 1 | H ₂ SO ₄ | ↓ |
| Diss. Cu and Zn * | HDPE | 250 ml | 1 | HNO ₃ | ↓ |
| Hardness, Total Cu and Zn | HDPE | 500 ml | 1 | HNO ₃ | ↓ |

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID: _____
 Filter blank sample ID: _____
 Transfer blank sample ID: _____

Visual and Olfactory Conditions:

Clarity: clear
 Color: none
 Odor: none
 Sheen: none
 Floatables: none

LABORATORY DELIVERY.

Date: _____ Time: _____

Quality Assurance

Checked By: J. Leuth Signature: [Signature]
 Date Checked: 2-16-18 Time: _____
 Data Entered into Database? YES NO initials: _____
 Date Entered: _____ Time: _____
 Notes: _____

Field Meter Calibration

Check which field meter was used and complete the meter calibration form
 YSI Pro Plus (15D100020) _____
~~YSI Pro DSS 1~~ _____
 YSI Pro DSS 2 _____

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)
 Stream Stage (ft): 0.97
 Reference Point (description): SL

Water Quality Measurements

Temperature (°C) 8.5°
 Specific Conductivity (µs/cm) 84.0
 Dissolved Oxygen (mg/L) 11.52

FIELD SAMPLING SHEET - Redmond Paired Watershed Study



Field Personnel: AS/VW

SITE ID: TOSMO

Sample Date: 1/29/18

Sample Time: 1118

PDT:

Base Flow or Storm Event? (circled)

Field Filtered Time: 1115

PST:

(Must filter within 15 minutes of collection)

Project Number: 14-05806-000

Water Quality Sampling

Sample ID: TOSMO-20180129

Project Name: Redmond Paired Watershed Study

Current Weather and Temp: LIGHT RAIN, 46°F

| Parameter | Bottle Type | Bottle Volume | # Bottles | Preservative | Duplicated? |
|---------------------------|-------------|---------------|-----------|--------------------------------|-------------|
| TSS and Turbidity | HDPE | 1L | 1 | NA | N |
| DOC * | HDPE | 250 ml | 1 | HCL | ↓ |
| Fecal Col. Bact. | HDPE | 250 ml | 1 | EDTA | |
| T. Phosphorous | HDPE | 250 ml | 1 | H ₂ SO ₄ | |
| T. Nitrogen | HDPE | 250 ml | 1 | H ₂ SO ₄ | |
| Diss. Cu and Zn * | HDPE | 250 ml | 1 | HNO ₃ | |
| Hardness, Total Cu and Zn | HDPE | 500 ml | 1 | HNO ₃ | ↓ |

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID: _____

Filter blank sample ID: _____

Transfer blank sample ID: _____

Visual and Olfactory Conditions:

Clarity: TURBID
 Color: BROWN
 Odor: NONE
 Sheen: NONE
 Floatables: MINOR AMT'S OF FOAM

LABORATORY DELIVERY

Date: _____

Time: _____

Quality Assurance

Checked By: Z. Lenth

Signature: _____

Date Checked: 2-16-18

Time: _____

Data Entered into Database? _____

YES

NO

initials: _____

Date Entered: _____

Time: _____

Notes: _____

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

YSI Pro Plus (15D100020) _____

YSI Pro DSS 1 _____

YSI Pro DSS 2 X

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): 0.80

Reference Point (description): S.G.

Water Quality Measurements

Temperature (°C) 8.6

Specific Conductivity (µs/cm) 151.6

Dissolved Oxygen (mg/L) 11.54

FIELD SAMPLING SHEET - Redmond Paired Watershed Study



Field Personnel: AS/VW
Sample Date: 1/29/18 **Sample Time:** 1150
Base Flow or Storm Event? Base Flow **Field Filtered Time:** 1155
(Must filter within 15 minutes of collection)

SITE ID: TYLMI
Project Number: 14-05806-000

Water Quality Sampling

Sample ID: TYLMI-20180129

| Parameter | Bottle Type | Bottle Volume | # Bottles | Preservative | Duplicated? |
|---------------------------|-------------|---------------|-----------|--------------------------------|-------------|
| TSS and Turbidity | HDPE | 1L | 1 | NA | N |
| DOC * | HDPE | 250 ml | 1 | HCL | |
| Fecal Col. Bact. | HDPE | 250 ml | 1 | EDTA | |
| T. Phosphorous | HDPE | 250 ml | 1 | H ₂ SO ₄ | |
| T. Nitrogen | HDPE | 250 ml | 1 | H ₂ SO ₄ | |
| Diss. Cu and Zn * | HDPE | 250 ml | 1 | HNO ₃ | |
| Hardness, Total Cu and Zn | HDPE | 500 ml | 1 | HNO ₃ | ↓ |

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID: _____
 Filter blank sample ID: _____
 Transfer blank sample ID: _____


Visual and Olfactory Conditions:

Clarity: SLIGHTLY TURBID
 Color: NOBLE
 Odor: ↓
 Sheen: ↓
 Floatables: ↓

LABORATORY DELIVERY

Date: _____ **Time:** _____

Quality Assurance

Checked By: J. Lenth **Signature:** 
Date Checked: 2-16-18 **Time:** _____
Data Entered into Database? YES NO initials: _____
Date Entered: _____ **Time:** _____
Notes: _____

Project Name: Redmond Paired Watershed Study
Current Weather and Temp: STEADY RAIN, 49°F

Field Meter Calibration

Check which field meter was used and complete the meter calibration form
 YSI Pro Plus (15D100020) _____
 YSI Pro DSS 1 _____
 YSI Pro DSS 2 X

Stream/Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)
Stream Stage (ft): 4.43
Reference Point (description): CULVERT TOP TO H₂O SURFACE

Water Quality Measurements

Temperature (°C) 7.7
Specific Conductivity (µs/cm) 127.7
Dissolved Oxygen (mg/L) 11.36

FIELD SAMPLING SHEET - Redmond Paired Watershed Study



Field Personnel: AS/VW SITE ID: TYLMO

Sample Date: 1/29/18 Sample Time: 1130 PDT: _____

Base Flow or Storm Event? (circled) Field Filtered Time: 1135 PST: _____

(Must filter within 15 minutes of collection)

Project Number: 14-05806-000

Project Name: Redmond Paired Watershed Study

Current Weather and Temp: LIGHT RAIN, 48°F

Water Quality Sampling

Sample ID: TYLMO-20180129

| Parameter | Bottle Type | Bottle Volume | # Bottles | Preservative | Duplicated? |
|---------------------------|-------------|---------------|-----------|--------------------------------|-------------|
| TSS and Turbidity | HDPE | 1L | 1 | NA | <u>N</u> |
| DOC * | HDPE | 250 ml | 1 | HCL | ↓ |
| Fecal Col. Bact. | HDPE | 250 ml | 1 | EDTA | |
| T. Phosphorous | HDPE | 250 ml | 1 | H ₂ SO ₄ | |
| T. Nitrogen | HDPE | 250 ml | 1 | H ₂ SO ₄ | |
| Diss. Cu and Zn * | HDPE | 250 ml | 1 | HNO ₃ | |
| Hardness, Total Cu and Zn | HDPE | 500 ml | 1 | HNO ₃ | |

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID: _____

Filter blank sample ID: _____

Transfer blank sample ID: _____

Visual and Olfactory Conditions:

Clarity: SUBTLY TURBID

Color: NONE

Odor: _____

Sheen: _____

Floatables: _____

LABORATORY DELIVERY

Date: _____ Time: _____

Quality Assurance

Checked By: J. Leitch Signature: _____

Date Checked: 2-16-18 Time: _____

Data Entered into Database? YES NO initials: _____

Date Entered: _____ Time: _____

Notes: _____

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

YSI Pro Plus (15D100020) _____

YSI Pro DSS 1 _____

YSI Pro DSS 2 X

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): 2.70

Reference Point (description): CULVERT TOP TO H₂O SURFACE

Water Quality Measurements

Temperature (°C) 8.0

Specific Conductivity (µs/cm) 68.7

Dissolved Oxygen (mg/L) 11.64



Data Quality Assurance Worksheet

Project Name/No./Client: Redmond Paired Watershed Study / 14-05806-000 / City of Redmond

Laboratory/Parameters: OnSite Environmental : TSS, turbidity, hardness, DOC, TP, Dissolved & Total Cu, Zn / AmTest: Total nitrogen, fecal coliform bacteria

Sample Date/Sample ID: 1/29/2018 / All sites, 1 FD (QA43) at MONMN

By G. Catarra

Date 2/16/2018 Page 1 of 2

Checked: initials

date 2/16/2018

JL

| Parameter | Completeness/ Methodology | Pre-preservation Holding Times (minutes) | | Total Holding Times (days) | | Method Blanks Reporting Limit | Matrix Spikes/ Surrogate Recovery (%) | | Lab Control Samples Recovery (%) | | Lab Duplicates RPD (%) | | Field Duplicates RPD (%) | | Instrument Calibration/ Performance | ACTION |
|-------------------------------------|------------------------------|--|------|-------------------------------|------|--|---|------|--|------|---------------------------|-------------------|-----------------------------|-------------------|---|--|
| | | Reported | Goal | Reported | Goal | | Reported | Goal | Reported | Goal | Reported | Goal ¹ | Reported | Goal ¹ | | |
| TSS | OK / SM 2540D | NA | NA | 1 | ≤7 | ≤1.0 mg/L 1.0 mg/L | NA | NA | 99 | ±20 | 1 | ≤25 | 38 | ≤25 | OK | FLAG MONMN "J" DUE TO FIELD DUP RPD |
| Turbidity | OK / EPA 180.1 | NA | NA | 1 | ≤2 | ≤0.1 NTU 0.1 NTU | NA | NA | NA | ±10 | 2 | ≤25 | 26 | ≤25 | OK | FLAG MONMN "J" DUE TO FIELD DUP RPD |
| Hardness | OK / SM 2340B | NA | NA | 1-2 | ≤180 | ≤1.0 mg/L 1.0 mg/L | 104,101 | ±25 | 104 | ±15 | 2 | ≤20 | 2.2 | ≤20 | OK | NONE |
| DOC | OK / SM 5310B | <15 | ≤15 | 7 | ≤28 | ≤1.0 mg/L 1.0 mg/L | 93 | ±25 | 100 | ±15 | 0 | ≤20 | 4.3 | ≤20 | OK | NONE |
| Total Phosphorus | OK / EPA 365.1 | NA | NA | 8 | ≤28 | ≤0.01 mg/L 0.01 mg/L | 100 | ±25 | 89 | ±20 | 5 | ≤20 | D=0.02 | ≤20 | OK | NONE |
| Total Nitrogen (TKN + N+N) | OK/ SM 4500 N-B | NA | NA | 3,10 | ≤28 | ≤0.1 mg/L 0.1 mg/L | 94-100 | ±25 | 93-101 | ±20 | 0-18 | ≤20 | D=0.18 13 | ≤20 | OK | NONE |

¹ If the sample or duplicate value is less than five times the reporting limit, the difference is calculated rather than the relative percent difference (RPD). The QA goal is a difference <2 times the detection limit instead of the number indicated in the goal column.

NA – not applicable or not available; NC – not calculable due to one or more values below the detection limit; NS – field duplicate not sampled.



Data Quality Assurance Worksheet

By G. Catarra

Project Name/No./Client: Redmond Paired Watershed Study / 14-05806-000 / City of Redmond

Date 2/16/2018 Page 2 of 2

Laboratory/Parameters: OnSite Environmental : TSS, turbidity, hardness, DOC, TP, Dissolved & Total Cu, Zn / AmTest: total nitrogen, fecal coliform bacteria

Checked: initials
JL

Sample Date/Sample ID: 1/29/2018 / All sites, 1 FD (QA43) at MONMN

date 2/16/2018

| Parameter | Completeness/ Methodology | Pre-preservation Holding Times (minutes) | | Total Holding Times (days) | | Method Blanks Reporting Limit | Matrix Spikes/ Surrogate Recovery (%) | | Lab Control Samples Recovery (%) | | Lab Duplicates RPD (%) | | Field Duplicates RPD (%) | | Instrument Calibration/ Performance | ACTION |
|------------------|------------------------------|--|------|-------------------------------|------|--|---|-------------------|--|------|---------------------------|-------------------|-----------------------------|-------------------|---|--------|
| | | Reported | Goal | Reported | Goal | | Reported | Goal ¹ | Reported | Goal | Reported | Goal ¹ | Reported | Goal ¹ | | |
| Total Copper | OK/ EPA 200.8 | NA | NA | 8 | ≤180 | ≤1.0 µg/L 1.0 µg/L | 86,85 | ±25 | NR | ±15 | NC | ≤20 | 6.4 | ≤20 | OK | NONE |
| Total Zinc | OK/ EPA 200.8 | NA | NA | 8 | ≤180 | ≤5.0 µg/L 5.0 µg/L | 86,88 | ±25 | NR | ±15 | NC | ≤20 | NC | ≤20 | OK | NONE |
| Dissolved Copper | OK/ EPA 200.8 | <15 | ≤15 | 9 | ≤180 | ≤1.0 µg/L 1.0 µg/L | 87,86 | ±25 | NR | ±15 | NC | ≤20 | 9.5 | ≤20 | OK | NONE |
| Dissolved Zinc | OK/ EPA 200.8 | <15 | ≤15 | 9 | ≤180 | ≤5.0 µg/L 5.0 µg/L | 88,89 | ±25 | NR | ±15 | NC | ≤20 | NC | ≤20 | OK | NONE |
| Fecal Coliform | OK / SM 9222D | NA | NA | <1 | ≤1 | ≤1.0 cfu/ 100mL 10 cfu/ 100mL | NA | NA | NA | NA | 7.6 | ≤35 | 22 | ≤50 | OK | NONE |

¹ If the sample or duplicate value is less than five times the reporting limit, the difference is calculated rather than the relative percent difference (RPD). The QA goal is a difference <2 times the detection limit instead of the number indicated in the goal column.

NA – not applicable or not available; NC – not calculable due to one or more values below the detection limit; NS – field duplicate not sampled.



14648 NE 95th Street, Redmond, WA 98052 • (425) 883-3881

February 23, 2018

George Iftner
Herrera Environmental Consultants, Inc.
2200 6th Avenue, Suite 1100
Seattle, WA 98121

Re: Analytical Data for Project 14-05806-000
Laboratory Reference No. 1802-016

Dear George:

Enclosed are the analytical results and associated quality control data for samples submitted on February 2, 2018.

The standard policy of OnSite Environmental, Inc. is to store your samples for 30 days from the date of receipt. If you require longer storage, please contact the laboratory.

We appreciate the opportunity to be of service to you on this project. If you have any questions concerning the data, or need additional information, please feel free to call me.

Sincerely,

A handwritten signature in black ink, appearing to read "Blair Goodrow", enclosed within a large, loopy circular flourish.

Blair Goodrow
Project Manager

Enclosures



OnSite Environmental, Inc. 14648 NE 95th Street, Redmond, WA 98052 (425) 883-3881

This report pertains to the samples analyzed in accordance with the chain of custody, and is intended only for the use of the individual or company to whom it is addressed.

Date of Report: February 23, 2018
Samples Submitted: February 2, 2018
Laboratory Reference: 1802-016
Project: 14-05806-000

Case Narrative

Samples were collected on February 2, 2018 and received by the laboratory on February 2, 2018. They were maintained at the laboratory at a temperature of 2°C to 6°C.

Please note that any and all soil sample results are reported on a dry-weight basis, unless otherwise noted below.

General QA/QC issues associated with the analytical data enclosed in this laboratory report will be indicated with a reference to a comment or explanation on the Data Qualifier page. More complex and involved QA/QC issues will be discussed in detail below.



Date of Report: February 23, 2018
 Samples Submitted: February 2, 2018
 Laboratory Reference: 1802-016
 Project: 14-05806-000

**TOTAL SUSPENDED SOLIDS
SM 2540D**

Matrix: Water
 Units: mg/L

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|------------------------|----------------------|-----|----------|---------------|---------------|-------|
| Client ID: | COLM-20180201 | | | | | |
| Laboratory ID: | 02-016-01 | | | | | |
| Total Suspended Solids | 1.5 | 1.0 | SM 2540D | 2-8-18 | 2-8-18 | |

| | | | | | | |
|------------------------|-----------------------|-----|----------|--------|--------|--|
| Client ID: | COUMI-20180201 | | | | | |
| Laboratory ID: | 02-016-02 | | | | | |
| Total Suspended Solids | 85 | 2.5 | SM 2540D | 2-8-18 | 2-8-18 | |

| | | | | | | |
|------------------------|-----------------------|-----|----------|--------|--------|--|
| Client ID: | COUMO-20180201 | | | | | |
| Laboratory ID: | 02-016-03 | | | | | |
| Total Suspended Solids | 25 | 2.5 | SM 2540D | 2-8-18 | 2-8-18 | |

| | | | | | | |
|------------------------|-----------------------|-----|----------|--------|--------|--|
| Client ID: | EVAMS-20180201 | | | | | |
| Laboratory ID: | 02-016-04 | | | | | |
| Total Suspended Solids | 19 | 2.5 | SM 2540D | 2-8-18 | 2-8-18 | |

| | | | | | | |
|------------------------|------------------------|-----|----------|--------|--------|--|
| Client ID: | EVALSS-20180201 | | | | | |
| Laboratory ID: | 02-016-05 | | | | | |
| Total Suspended Solids | 33 | 2.5 | SM 2540D | 2-8-18 | 2-8-18 | |

| | | | | | | |
|------------------------|-----------------------|-----|----------|--------|--------|--|
| Client ID: | MONMN-20180201 | | | | | |
| Laboratory ID: | 02-016-06 | | | | | |
| Total Suspended Solids | 25 | 2.5 | SM 2540D | 2-8-18 | 2-8-18 | |

| | | | | | | |
|------------------------|-----------------------|-----|----------|--------|--------|--|
| Client ID: | MONMS-20180201 | | | | | |
| Laboratory ID: | 02-016-07 | | | | | |
| Total Suspended Solids | 12 | 2.5 | SM 2540D | 2-8-18 | 2-8-18 | |



Date of Report: February 23, 2018
 Samples Submitted: February 2, 2018
 Laboratory Reference: 1802-016
 Project: 14-05806-000

**TOTAL SUSPENDED SOLIDS
 SM 2540D**

Matrix: Water
 Units: mg/L

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|------------------------|----------------------|-----|----------|---------------|---------------|-------|
| Client ID: | MONM-20180201 | | | | | |
| Laboratory ID: | 02-016-08 | | | | | |
| Total Suspended Solids | 23 | 2.5 | SM 2540D | 2-8-18 | 2-8-18 | |

| | | | | | | |
|------------------------|-----------------------|-----|----------|--------|--------|--|
| Client ID: | SEIMN-20180201 | | | | | |
| Laboratory ID: | 02-016-09 | | | | | |
| Total Suspended Solids | 35 | 2.5 | SM 2540D | 2-8-18 | 2-8-18 | |

| | | | | | | |
|------------------------|-----------------------|-----|----------|--------|--------|--|
| Client ID: | SEIMS-20180201 | | | | | |
| Laboratory ID: | 02-016-10 | | | | | |
| Total Suspended Solids | 44 | 2.5 | SM 2540D | 2-8-18 | 2-8-18 | |

| | | | | | | |
|------------------------|-----------------------|-----|----------|--------|--------|--|
| Client ID: | TOSMI-20180201 | | | | | |
| Laboratory ID: | 02-016-11 | | | | | |
| Total Suspended Solids | 82 | 2.5 | SM 2540D | 2-8-18 | 2-8-18 | |

| | | | | | | |
|------------------------|-----------------------|-----|----------|--------|--------|--|
| Client ID: | TOSMO-20180201 | | | | | |
| Laboratory ID: | 02-016-12 | | | | | |
| Total Suspended Solids | 150 | 2.5 | SM 2540D | 2-8-18 | 2-8-18 | |

| | | | | | | |
|------------------------|-----------------------|-----|----------|--------|--------|--|
| Client ID: | TYLMI-20180201 | | | | | |
| Laboratory ID: | 02-016-13 | | | | | |
| Total Suspended Solids | 32 | 2.5 | SM 2540D | 2-8-18 | 2-8-18 | |

| | | | | | | |
|------------------------|-----------------------|-----|----------|--------|--------|--|
| Client ID: | TYLMO-20180201 | | | | | |
| Laboratory ID: | 02-016-14 | | | | | |
| Total Suspended Solids | 58 | 2.5 | SM 2540D | 2-8-18 | 2-8-18 | |



Date of Report: February 23, 2018
Samples Submitted: February 2, 2018
Laboratory Reference: 1802-016
Project: 14-05806-000

**TOTAL SUSPENDED SOLIDS
SM 2540D**

Matrix: Water
Units: mg/L

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|------------------------|----------------------|------------|---------------|----------------------|----------------------|--------------|
| Client ID: | QA44-20180201 | | | | | |
| Laboratory ID: | 02-016-15 | | | | | |
| Total Suspended Solids | 15 | 2.5 | SM 2540D | 2-8-18 | 2-8-18 | |



Date of Report: February 23, 2018
 Samples Submitted: February 2, 2018
 Laboratory Reference: 1802-016
 Project: 14-05806-000

**TOTAL SUSPENDED SOLIDS
 SM 2540D
 QUALITY CONTROL**

Matrix: Water
 Units: mg/L

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|------------------------|-----------|-----|----------|---------------|---------------|-------|
| METHOD BLANK | | | | | | |
| Laboratory ID: | MB0208W1 | | | | | |
| Total Suspended Solids | ND | 1.0 | SM 2540D | 2-8-18 | 2-8-18 | |

| Analyte | Result | Spike Level | Source Result | Percent Recovery | Recovery Limits | RPD | RPD Limit | Flags |
|------------------------|------------|-------------|---------------|------------------|-----------------|-----|-----------|-------|
| DUPLICATE | | | | | | | | |
| Laboratory ID: | 02-063-01 | | | | | | | |
| | ORIG | DUP | | | | | | |
| Total Suspended Solids | 247 | 260 | NA | NA | NA | 5 | 17 | |

| | | | | | | | | |
|------------------------|------------|-----|----|-----|--------|----|----|--|
| SPIKE BLANK | | | | | | | | |
| Laboratory ID: | SB0208W1 | | | | | | | |
| | SB | SB | | SB | | | | |
| Total Suspended Solids | 107 | 100 | NA | 107 | 76-114 | NA | NA | |



Date of Report: February 23, 2018
 Samples Submitted: February 2, 2018
 Laboratory Reference: 1802-016
 Project: 14-05806-000

TURBIDITY
EPA 180.1

Matrix: Water
 Units: NTU

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|-------------------|----------------------|------|-----------|---------------|---------------|-------|
| Client ID: | COLM-20180201 | | | | | |
| Laboratory ID: | 02-016-01 | | | | | |
| Turbidity | 0.60 | 0.10 | EPA 180.1 | 2-2-18 | 2-2-18 | |

| | | | | | | |
|-------------------|-----------------------|------|-----------|--------|--------|--|
| Client ID: | COUMI-20180201 | | | | | |
| Laboratory ID: | 02-016-02 | | | | | |
| Turbidity | 12 | 0.10 | EPA 180.1 | 2-2-18 | 2-2-18 | |

| | | | | | | |
|-------------------|-----------------------|------|-----------|--------|--------|--|
| Client ID: | COUMO-20180201 | | | | | |
| Laboratory ID: | 02-016-03 | | | | | |
| Turbidity | 9.8 | 0.10 | EPA 180.1 | 2-2-18 | 2-2-18 | |

| | | | | | | |
|-------------------|-----------------------|------|-----------|--------|--------|--|
| Client ID: | EVAMS-20180201 | | | | | |
| Laboratory ID: | 02-016-04 | | | | | |
| Turbidity | 5.1 | 0.10 | EPA 180.1 | 2-2-18 | 2-2-18 | |

| | | | | | | |
|-------------------|------------------------|------|-----------|--------|--------|--|
| Client ID: | EVALSS-20180201 | | | | | |
| Laboratory ID: | 02-016-05 | | | | | |
| Turbidity | 7.0 | 0.10 | EPA 180.1 | 2-2-18 | 2-2-18 | |

| | | | | | | |
|-------------------|-----------------------|------|-----------|--------|--------|--|
| Client ID: | MONMN-20180201 | | | | | |
| Laboratory ID: | 02-016-06 | | | | | |
| Turbidity | 11 | 0.10 | EPA 180.1 | 2-2-18 | 2-2-18 | |

| | | | | | | |
|-------------------|-----------------------|------|-----------|--------|--------|--|
| Client ID: | MONMS-20180201 | | | | | |
| Laboratory ID: | 02-016-07 | | | | | |
| Turbidity | 5.9 | 0.10 | EPA 180.1 | 2-2-18 | 2-2-18 | |



Date of Report: February 23, 2018
 Samples Submitted: February 2, 2018
 Laboratory Reference: 1802-016
 Project: 14-05806-000

TURBIDITY
EPA 180.1

Matrix: Water
 Units: NTU

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|-------------------|----------------------|------|-----------|---------------|---------------|-------|
| Client ID: | MONM-20180201 | | | | | |
| Laboratory ID: | 02-016-08 | | | | | |
| Turbidity | 13 | 0.10 | EPA 180.1 | 2-2-18 | 2-2-18 | |

| | | | | | | |
|-------------------|-----------------------|------|-----------|--------|--------|--|
| Client ID: | SEIMN-20180201 | | | | | |
| Laboratory ID: | 02-016-09 | | | | | |
| Turbidity | 8.0 | 0.10 | EPA 180.1 | 2-2-18 | 2-2-18 | |

| | | | | | | |
|-------------------|-----------------------|------|-----------|--------|--------|--|
| Client ID: | SEIMS-20180201 | | | | | |
| Laboratory ID: | 02-016-10 | | | | | |
| Turbidity | 9.8 | 0.10 | EPA 180.1 | 2-2-18 | 2-2-18 | |

| | | | | | | |
|-------------------|-----------------------|------|-----------|--------|--------|--|
| Client ID: | TOSMI-20180201 | | | | | |
| Laboratory ID: | 02-016-11 | | | | | |
| Turbidity | 19 | 0.10 | EPA 180.1 | 2-2-18 | 2-2-18 | |

| | | | | | | |
|-------------------|-----------------------|------|-----------|--------|--------|--|
| Client ID: | TOSMO-20180201 | | | | | |
| Laboratory ID: | 02-016-12 | | | | | |
| Turbidity | 29 | 0.10 | EPA 180.1 | 2-2-18 | 2-2-18 | |

| | | | | | | |
|-------------------|-----------------------|------|-----------|--------|--------|--|
| Client ID: | TYLMI-20180201 | | | | | |
| Laboratory ID: | 02-016-13 | | | | | |
| Turbidity | 9.1 | 0.10 | EPA 180.1 | 2-2-18 | 2-2-18 | |

| | | | | | | |
|-------------------|-----------------------|------|-----------|--------|--------|--|
| Client ID: | TYLMO-20180201 | | | | | |
| Laboratory ID: | 02-016-14 | | | | | |
| Turbidity | 20 | 0.10 | EPA 180.1 | 2-2-18 | 2-2-18 | |



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TURBIDITY
EPA 180.1

Matrix: Water
Units: NTU

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|-------------------|----------------------|------------|---------------|----------------------|----------------------|--------------|
| Client ID: | QA44-20180201 | | | | | |
| Laboratory ID: | 02-016-15 | | | | | |
| Turbidity | 4.8 | 0.10 | EPA 180.1 | 2-2-18 | 2-2-18 | |



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**TURBIDITY
 EPA 180.1
 QUALITY CONTROL**

Matrix: Water
 Units: NTU

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|---------------------|-----------|------|-----------|---------------|---------------|-------|
| METHOD BLANK | | | | | | |
| Laboratory ID: | MB0202W1 | | | | | |
| Turbidity | ND | 0.10 | EPA 180.1 | 2-2-18 | 2-2-18 | |

| Analyte | Result | Spike Level | Source Result | Percent Recovery | Recovery Limits | RPD | RPD Limit | Flags |
|------------------|-------------|-------------|---------------|------------------|-----------------|-----|-----------|-------|
| DUPLICATE | | | | | | | | |
| Laboratory ID: | 02-015-01 | | | | | | | |
| | ORIG | DUP | | | | | | |
| Turbidity | 24.0 | 24.0 | NA | NA | NA | NA | 0 | 15 |



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HARDNESS
EPA 200.7/SM 2340B

Matrix: Water
 Units: mg eqt. CaCO₃/L (ppm)

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|-------------------|----------------------|-----|----------------|---------------|---------------|-------|
| Client ID: | COLM-20180201 | | | | | |
| Laboratory ID: | 02-016-01 | | | | | |
| Hardness | 7.1 | 1.0 | 200.7/SM 2340B | 2-13-18 | 2-13-18 | |

| | | | | | | |
|-------------------|-----------------------|-----|----------------|---------|---------|--|
| Client ID: | COUMI-20180201 | | | | | |
| Laboratory ID: | 02-016-02 | | | | | |
| Hardness | 52 | 1.0 | 200.7/SM 2340B | 2-13-18 | 2-13-18 | |

| | | | | | | |
|-------------------|-----------------------|-----|----------------|---------|---------|--|
| Client ID: | COUMO-20180201 | | | | | |
| Laboratory ID: | 02-016-03 | | | | | |
| Hardness | 53 | 1.0 | 200.7/SM 2340B | 2-13-18 | 2-13-18 | |

| | | | | | | |
|-------------------|-----------------------|-----|----------------|---------|---------|--|
| Client ID: | EVAMS-20180201 | | | | | |
| Laboratory ID: | 02-016-04 | | | | | |
| Hardness | 63 | 1.0 | 200.7/SM 2340B | 2-13-18 | 2-13-18 | |

| | | | | | | |
|-------------------|------------------------|-----|----------------|---------|---------|--|
| Client ID: | EVALSS-20180201 | | | | | |
| Laboratory ID: | 02-016-05 | | | | | |
| Hardness | 60 | 1.0 | 200.7/SM 2340B | 2-13-18 | 2-13-18 | |

| | | | | | | |
|-------------------|-----------------------|-----|----------------|---------|---------|--|
| Client ID: | MONMN-20180201 | | | | | |
| Laboratory ID: | 02-016-06 | | | | | |
| Hardness | 38 | 1.0 | 200.7/SM 2340B | 2-13-18 | 2-13-18 | |

| | | | | | | |
|-------------------|-----------------------|-----|----------------|---------|---------|--|
| Client ID: | MONMS-20180201 | | | | | |
| Laboratory ID: | 02-016-07 | | | | | |
| Hardness | 62 | 1.0 | 200.7/SM 2340B | 2-13-18 | 2-13-18 | |



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HARDNESS
EPA 200.7/SM 2340B

Matrix: Water
 Units: mg eqt. CaCO₃/L (ppm)

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|-------------------|----------------------|-----|----------------|---------------|---------------|-------|
| Client ID: | MONM-20180201 | | | | | |
| Laboratory ID: | 02-016-08 | | | | | |
| Hardness | 48 | 1.0 | 200.7/SM 2340B | 2-13-18 | 2-13-18 | |

| | | | | | | |
|-------------------|-----------------------|-----|----------------|---------|---------|--|
| Client ID: | SEIMN-20180201 | | | | | |
| Laboratory ID: | 02-016-09 | | | | | |
| Hardness | 18 | 1.0 | 200.7/SM 2340B | 2-13-18 | 2-13-18 | |

| | | | | | | |
|-------------------|-----------------------|-----|----------------|---------|---------|--|
| Client ID: | SEIMS-20180201 | | | | | |
| Laboratory ID: | 02-016-10 | | | | | |
| Hardness | 30 | 1.0 | 200.7/SM 2340B | 2-13-18 | 2-13-18 | |

| | | | | | | |
|-------------------|-----------------------|-----|----------------|---------|---------|--|
| Client ID: | TOSMI-20180201 | | | | | |
| Laboratory ID: | 02-016-11 | | | | | |
| Hardness | 39 | 1.0 | 200.7/SM 2340B | 2-13-18 | 2-13-18 | |

| | | | | | | |
|-------------------|-----------------------|-----|----------------|---------|---------|--|
| Client ID: | TOSMO-20180201 | | | | | |
| Laboratory ID: | 02-016-12 | | | | | |
| Hardness | 56 | 1.0 | 200.7/SM 2340B | 2-13-18 | 2-13-18 | |

| | | | | | | |
|-------------------|-----------------------|-----|----------------|---------|---------|--|
| Client ID: | TYLMI-20180201 | | | | | |
| Laboratory ID: | 02-016-13 | | | | | |
| Hardness | 44 | 1.0 | 200.7/SM 2340B | 2-13-18 | 2-13-18 | |

| | | | | | | |
|-------------------|-----------------------|-----|----------------|---------|---------|--|
| Client ID: | TYLMO-20180201 | | | | | |
| Laboratory ID: | 02-016-14 | | | | | |
| Hardness | 25 | 1.0 | 200.7/SM 2340B | 2-13-18 | 2-13-18 | |



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HARDNESS
EPA 200.7/SM 2340B

Matrix: Water
Units: mg eqt. CaCO₃/L (ppm)

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|-------------------|----------------------|------------|----------------|----------------------|----------------------|--------------|
| Client ID: | QA44-20180201 | | | | | |
| Laboratory ID: | 02-016-15 | | | | | |
| Hardness | 64 | 1.0 | 200.7/SM 2340B | 2-13-18 | 2-13-18 | |



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HARDNESS
EPA 200.7/SM 2340B
QUALITY CONTROL

Matrix: Water
 Units: mg eqt. CaCO₃/L (ppm)

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|---------------------|-----------|-----|----------------|---------------|---------------|-------|
| METHOD BLANK | | | | | | |
| Laboratory ID: | MB0213WH1 | | | | | |
| Hardness | ND | 1.0 | 200.7/SM 2340B | 2-13-18 | 2-13-18 | |

| Analyte | Result | Spike Level | Source Result | Percent Recovery | Recovery Limits | RPD | RPD Limit | Flags |
|------------------|-------------|-------------|---------------|------------------|-----------------|-----|-----------|-------|
| DUPLICATE | | | | | | | | |
| Laboratory ID: | 02-016-01 | | | | | | | |
| | ORIG | DUP | | | | | | |
| Hardness | 7.06 | 6.94 | NA | NA | NA | NA | 2 | 20 |

| Analyte | Result | Spike Level | Source Result | Percent Recovery | Recovery Limits | RPD | RPD Limit | Flags | | |
|----------------------|------------|-------------|---------------|------------------|-----------------|-----|-----------|--------|---|----|
| MATRIX SPIKES | | | | | | | | | | |
| Laboratory ID: | 02-016-01 | | | | | | | | | |
| | MS | MSD | MS | MSD | MS | MSD | | | | |
| Hardness | 142 | 137 | 132 | 132 | 7.06 | 102 | 98 | 75-125 | 4 | 20 |

| Analyte | Result | Spike Level | Source Result | Percent Recovery | Recovery Limits | RPD | RPD Limit | Flags |
|--------------------|------------|-------------|---------------|------------------|-----------------|-----|-----------|-------|
| SPIKE BLANK | | | | | | | | |
| Laboratory ID: | SB0213WH1 | | | | | | | |
| | SB | SB | | | SB | | | |
| Hardness | 131 | 132 | NA | 99 | 80-120 | NA | NA | |



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 Project: 14-05806-000

**DISSOLVED ORGANIC CARBON
 SM 5310B**

Matrix: Water
 Units: mg/L

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|--------------------------|------------------------|-----|----------|---------------|---------------|-------|
| Client ID: | COLM-20180201 | | | | | |
| Laboratory ID: | 02-016-01 | | | | | |
| Dissolved Organic Carbon | 9.4 | 1.0 | SM 5310B | 2-5-18 | 2-5-18 | |
| Client ID: | COUMI-20180201 | | | | | |
| Laboratory ID: | 02-016-02 | | | | | |
| Dissolved Organic Carbon | 3.7 | 1.0 | SM 5310B | 2-5-18 | 2-5-18 | |
| Client ID: | COUMO-20180201 | | | | | |
| Laboratory ID: | 02-016-03 | | | | | |
| Dissolved Organic Carbon | 3.8 | 1.0 | SM 5310B | 2-5-18 | 2-5-18 | |
| Client ID: | EVAMS-20180201 | | | | | |
| Laboratory ID: | 02-016-04 | | | | | |
| Dissolved Organic Carbon | 5.4 | 1.0 | SM 5310B | 2-5-18 | 2-5-18 | |
| Client ID: | EVALSS-20180201 | | | | | |
| Laboratory ID: | 02-016-05 | | | | | |
| Dissolved Organic Carbon | 4.7 | 1.0 | SM 5310B | 2-5-18 | 2-5-18 | |
| Client ID: | MONMN-20180201 | | | | | |
| Laboratory ID: | 02-016-06 | | | | | |
| Dissolved Organic Carbon | 5.1 | 1.0 | SM 5310B | 2-5-18 | 2-5-18 | |
| Client ID: | MONMS-20180201 | | | | | |
| Laboratory ID: | 02-016-07 | | | | | |
| Dissolved Organic Carbon | 5.3 | 1.0 | SM 5310B | 2-5-18 | 2-5-18 | |



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 Project: 14-05806-000

**DISSOLVED ORGANIC CARBON
 SM 5310B**

Matrix: Water
 Units: mg/L

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|--------------------------|-----------------------|-----|----------|---------------|---------------|-------|
| Client ID: | MONM-20180201 | | | | | |
| Laboratory ID: | 02-016-08 | | | | | |
| Dissolved Organic Carbon | 5.1 | 1.0 | SM 5310B | 2-5-18 | 2-5-18 | |
| Client ID: | SEIMN-20180201 | | | | | |
| Laboratory ID: | 02-016-09 | | | | | |
| Dissolved Organic Carbon | 7.0 | 1.0 | SM 5310B | 2-5-18 | 2-5-18 | |
| Client ID: | SEIMS-20180201 | | | | | |
| Laboratory ID: | 02-016-10 | | | | | |
| Dissolved Organic Carbon | 7.5 | 1.0 | SM 5310B | 2-5-18 | 2-5-18 | |
| Client ID: | TOSMI-20180201 | | | | | |
| Laboratory ID: | 02-016-11 | | | | | |
| Dissolved Organic Carbon | 3.5 | 1.0 | SM 5310B | 2-5-18 | 2-5-18 | |
| Client ID: | TOSMO-20180201 | | | | | |
| Laboratory ID: | 02-016-12 | | | | | |
| Dissolved Organic Carbon | 4.1 | 1.0 | SM 5310B | 2-5-18 | 2-5-18 | |
| Client ID: | TYLMI-20180201 | | | | | |
| Laboratory ID: | 02-016-13 | | | | | |
| Dissolved Organic Carbon | 5.6 | 1.0 | SM 5310B | 2-5-18 | 2-5-18 | |
| Client ID: | TYLMO-20180201 | | | | | |
| Laboratory ID: | 02-016-14 | | | | | |
| Dissolved Organic Carbon | 3.3 | 1.0 | SM 5310B | 2-5-18 | 2-5-18 | |



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**DISSOLVED ORGANIC CARBON
SM 5310B**

Matrix: Water
Units: mg/L

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|--------------------------|----------------------|------------|---------------|----------------------|----------------------|--------------|
| Client ID: | QA44-20180201 | | | | | |
| Laboratory ID: | 02-016-15 | | | | | |
| Dissolved Organic Carbon | 5.2 | 1.0 | SM 5310B | 2-5-18 | 2-5-18 | |



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**DISSOLVED ORGANIC CARBON
 SM 5310B
 QUALITY CONTROL**

Matrix: Water
 Units: mg/L

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|--------------------------|-----------|-----|----------|---------------|---------------|-------|
| METHOD BLANK | | | | | | |
| Laboratory ID: | MB0205D2 | | | | | |
| Dissolved Organic Carbon | ND | 1.0 | SM 5310B | 2-5-18 | 2-5-18 | |

| Analyte | Result | Spike Level | Source Result | Percent Recovery | Recovery Limits | RPD | RPD Limit | Flags |
|--------------------------|-------------|-------------|---------------|------------------|-----------------|-----|-----------|-------|
| DUPLICATE | | | | | | | | |
| Laboratory ID: | 02-016-01 | | | | | | | |
| | ORIG | DUP | | | | | | |
| Dissolved Organic Carbon | 9.39 | 9.42 | NA | NA | NA | 0 | 15 | |

MATRIX SPIKE

| | | | | | | | | |
|--------------------------|-------------|------|------|----|--------|----|----|--|
| Laboratory ID: | 02-016-01 | | | | | | | |
| | MS | MS | | MS | | | | |
| Dissolved Organic Carbon | 18.7 | 10.0 | 9.39 | 93 | 75-125 | NA | NA | |

SPIKE BLANK

| | | | | | | | | |
|--------------------------|-------------|------|----|-----|--------|----|----|--|
| Laboratory ID: | SB0205D2 | | | | | | | |
| | SB | SB | | SB | | | | |
| Dissolved Organic Carbon | 9.96 | 10.0 | NA | 100 | 80-120 | NA | NA | |



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TOTAL PHOSPHORUS
EPA 365.1

Matrix: Water
 Units: mg/L

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|-------------------|----------------------|-------|-----------|---------------|---------------|-------|
| Client ID: | COLM-20180201 | | | | | |
| Laboratory ID: | 02-016-01 | | | | | |
| Total Phosphorus | ND | 0.010 | EPA 365.1 | 2-6-18 | 2-6-18 | |

| | | | | | | |
|-------------------|-----------------------|-------|-----------|--------|--------|--|
| Client ID: | COUMI-20180201 | | | | | |
| Laboratory ID: | 02-016-02 | | | | | |
| Total Phosphorus | 0.10 | 0.010 | EPA 365.1 | 2-6-18 | 2-6-18 | |

| | | | | | | |
|-------------------|-----------------------|-------|-----------|--------|--------|--|
| Client ID: | COUMO-20180201 | | | | | |
| Laboratory ID: | 02-016-03 | | | | | |
| Total Phosphorus | 0.042 | 0.010 | EPA 365.1 | 2-6-18 | 2-6-18 | |

| | | | | | | |
|-------------------|-----------------------|-------|-----------|--------|--------|--|
| Client ID: | EVAMS-20180201 | | | | | |
| Laboratory ID: | 02-016-04 | | | | | |
| Total Phosphorus | 0.024 | 0.010 | EPA 365.1 | 2-6-18 | 2-6-18 | |

| | | | | | | |
|-------------------|------------------------|-------|-----------|--------|--------|--|
| Client ID: | EVALSS-20180201 | | | | | |
| Laboratory ID: | 02-016-05 | | | | | |
| Total Phosphorus | 0.041 | 0.010 | EPA 365.1 | 2-6-18 | 2-6-18 | |

| | | | | | | |
|-------------------|-----------------------|-------|-----------|--------|--------|--|
| Client ID: | MONMN-20180201 | | | | | |
| Laboratory ID: | 02-016-06 | | | | | |
| Total Phosphorus | 0.041 | 0.010 | EPA 365.1 | 2-6-18 | 2-6-18 | |

| | | | | | | |
|-------------------|-----------------------|-------|-----------|--------|--------|--|
| Client ID: | MONMS-20180201 | | | | | |
| Laboratory ID: | 02-016-07 | | | | | |
| Total Phosphorus | 0.036 | 0.010 | EPA 365.1 | 2-6-18 | 2-6-18 | |



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TOTAL PHOSPHORUS
EPA 365.1

Matrix: Water
 Units: mg/L

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|-------------------|----------------------|-------|-----------|---------------|---------------|-------|
| Client ID: | MONM-20180201 | | | | | |
| Laboratory ID: | 02-016-08 | | | | | |
| Total Phosphorus | 0.041 | 0.010 | EPA 365.1 | 2-6-18 | 2-6-18 | |

| | | | | | | |
|-------------------|-----------------------|-------|-----------|--------|--------|--|
| Client ID: | SEIMN-20180201 | | | | | |
| Laboratory ID: | 02-016-09 | | | | | |
| Total Phosphorus | 0.030 | 0.010 | EPA 365.1 | 2-6-18 | 2-6-18 | |

| | | | | | | |
|-------------------|-----------------------|-------|-----------|--------|--------|--|
| Client ID: | SEIMS-20180201 | | | | | |
| Laboratory ID: | 02-016-10 | | | | | |
| Total Phosphorus | 0.062 | 0.010 | EPA 365.1 | 2-6-18 | 2-6-18 | |

| | | | | | | |
|-------------------|-----------------------|-------|-----------|--------|--------|--|
| Client ID: | TOSMI-20180201 | | | | | |
| Laboratory ID: | 02-016-11 | | | | | |
| Total Phosphorus | 0.070 | 0.010 | EPA 365.1 | 2-6-18 | 2-6-18 | |

| | | | | | | |
|-------------------|-----------------------|-------|-----------|--------|--------|--|
| Client ID: | TOSMO-20180201 | | | | | |
| Laboratory ID: | 02-016-12 | | | | | |
| Total Phosphorus | 0.13 | 0.010 | EPA 365.1 | 2-6-18 | 2-6-18 | |

| | | | | | | |
|-------------------|-----------------------|-------|-----------|--------|--------|--|
| Client ID: | TYLMI-20180201 | | | | | |
| Laboratory ID: | 02-016-13 | | | | | |
| Total Phosphorus | 0.051 | 0.010 | EPA 365.1 | 2-6-18 | 2-6-18 | |

| | | | | | | |
|-------------------|-----------------------|-------|-----------|--------|--------|--|
| Client ID: | TYLMO-20180201 | | | | | |
| Laboratory ID: | 02-016-14 | | | | | |
| Total Phosphorus | 0.080 | 0.010 | EPA 365.1 | 2-6-18 | 2-6-18 | |



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TOTAL PHOSPHORUS
EPA 365.1

Matrix: Water
Units: mg/L

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|-------------------|----------------------|------------|---------------|----------------------|----------------------|--------------|
| Client ID: | QA44-20180201 | | | | | |
| Laboratory ID: | 02-016-15 | | | | | |
| Total Phosphorus | 0.031 | 0.010 | EPA 365.1 | 2-6-18 | 2-6-18 | |



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**TOTAL PHOSPHORUS
 EPA 365.1
 QUALITY CONTROL**

Matrix: Water
 Units: mg/L

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|---------------------|-----------|-------|-----------|---------------|---------------|-------|
| METHOD BLANK | | | | | | |
| Laboratory ID: | MB0206W2 | | | | | |
| Total Phosphorus | ND | 0.010 | EPA 365.1 | 2-6-18 | 2-6-18 | |

| Analyte | Result | Spike Level | Source Result | Percent Recovery | Recovery Limits | RPD | RPD Limit | Flags |
|------------------|-----------|-------------|---------------|------------------|-----------------|-----|-----------|-------|
| DUPLICATE | | | | | | | | |
| Laboratory ID: | 02-016-01 | | | | | | | |
| | ORIG | DUP | | | | | | |
| Total Phosphorus | ND | ND | NA | NA | NA | NA | 11 | |

| | | | | | | | | |
|---------------------|--------------|-------|----|----|--------|----|----|--|
| MATRIX SPIKE | | | | | | | | |
| Laboratory ID: | 02-016-01 | | | | | | | |
| | MS | MS | | MS | | | | |
| Total Phosphorus | 0.243 | 0.250 | ND | 97 | 82-124 | NA | NA | |

| | | | | | | | | |
|--------------------|--------------|-------|----|----|--------|----|----|--|
| SPIKE BLANK | | | | | | | | |
| Laboratory ID: | SB0206W2 | | | | | | | |
| | SB | SB | | SB | | | | |
| Total Phosphorus | 0.222 | 0.250 | NA | 89 | 87-114 | NA | NA | |



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**TOTAL METALS
 EPA 200.8**

Matrix: Water
 Units: ug/L (ppb)

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|-------------------|----------------------|-----|-----------|---------------|---------------|-------|
| Client ID: | COLM-20180201 | | | | | |
| Laboratory ID: | 02-016-01 | | | | | |
| Copper | ND | 1.0 | EPA 200.8 | 2-13-18 | 2-13-18 | |
| Zinc | ND | 5.0 | EPA 200.8 | 2-13-18 | 2-13-18 | |

| | | | | | | |
|-------------------|-----------------------|-----|-----------|---------|---------|--|
| Client ID: | COUMI-20180201 | | | | | |
| Laboratory ID: | 02-016-02 | | | | | |
| Copper | 5.0 | 1.0 | EPA 200.8 | 2-13-18 | 2-13-18 | |
| Zinc | 26 | 5.0 | EPA 200.8 | 2-13-18 | 2-13-18 | |

| | | | | | | |
|-------------------|-----------------------|-----|-----------|---------|---------|--|
| Client ID: | COUMO-20180201 | | | | | |
| Laboratory ID: | 02-016-03 | | | | | |
| Copper | 3.4 | 1.0 | EPA 200.8 | 2-13-18 | 2-13-18 | |
| Zinc | 19 | 5.0 | EPA 200.8 | 2-13-18 | 2-13-18 | |

| | | | | | | |
|-------------------|-----------------------|-----|-----------|---------|---------|--|
| Client ID: | EVAMS-20180201 | | | | | |
| Laboratory ID: | 02-016-04 | | | | | |
| Copper | ND | 1.0 | EPA 200.8 | 2-13-18 | 2-13-18 | |
| Zinc | ND | 5.0 | EPA 200.8 | 2-13-18 | 2-13-18 | |

| | | | | | | |
|-------------------|------------------------|-----|-----------|---------|---------|--|
| Client ID: | EVALSS-20180201 | | | | | |
| Laboratory ID: | 02-016-05 | | | | | |
| Copper | 1.1 | 1.0 | EPA 200.8 | 2-13-18 | 2-13-18 | |
| Zinc | ND | 5.0 | EPA 200.8 | 2-13-18 | 2-13-18 | |

| | | | | | | |
|-------------------|-----------------------|-----|-----------|---------|---------|--|
| Client ID: | MONMN-20180201 | | | | | |
| Laboratory ID: | 02-016-06 | | | | | |
| Copper | 2.1 | 1.0 | EPA 200.8 | 2-13-18 | 2-13-18 | |
| Zinc | 8.6 | 5.0 | EPA 200.8 | 2-13-18 | 2-13-18 | |

| | | | | | | |
|-------------------|-----------------------|-----|-----------|---------|---------|--|
| Client ID: | MONMS-20180201 | | | | | |
| Laboratory ID: | 02-016-07 | | | | | |
| Copper | 2.7 | 1.0 | EPA 200.8 | 2-13-18 | 2-13-18 | |
| Zinc | 5.8 | 5.0 | EPA 200.8 | 2-13-18 | 2-13-18 | |



Date of Report: February 23, 2018
 Samples Submitted: February 2, 2018
 Laboratory Reference: 1802-016
 Project: 14-05806-000

**TOTAL METALS
 EPA 200.8**

Matrix: Water
 Units: ug/L (ppb)

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|-------------------|----------------------|-----|-----------|---------------|---------------|-------|
| Client ID: | MONM-20180201 | | | | | |
| Laboratory ID: | 02-016-08 | | | | | |
| Copper | 2.3 | 1.0 | EPA 200.8 | 2-13-18 | 2-13-18 | |
| Zinc | 14 | 5.0 | EPA 200.8 | 2-13-18 | 2-13-18 | |

| | | | | | | |
|-------------------|-----------------------|-----|-----------|---------|---------|--|
| Client ID: | SEIMN-20180201 | | | | | |
| Laboratory ID: | 02-016-09 | | | | | |
| Copper | 1.3 | 1.0 | EPA 200.8 | 2-13-18 | 2-13-18 | |
| Zinc | ND | 5.0 | EPA 200.8 | 2-13-18 | 2-13-18 | |

| | | | | | | |
|-------------------|-----------------------|-----|-----------|---------|---------|--|
| Client ID: | SEIMS-20180201 | | | | | |
| Laboratory ID: | 02-016-10 | | | | | |
| Copper | 3.1 | 1.0 | EPA 200.8 | 2-13-18 | 2-13-18 | |
| Zinc | ND | 5.0 | EPA 200.8 | 2-13-18 | 2-13-18 | |

| | | | | | | |
|-------------------|-----------------------|-----|-----------|---------|---------|--|
| Client ID: | TOSMI-20180201 | | | | | |
| Laboratory ID: | 02-016-11 | | | | | |
| Copper | 8.7 | 1.0 | EPA 200.8 | 2-13-18 | 2-13-18 | |
| Zinc | 71 | 5.0 | EPA 200.8 | 2-13-18 | 2-13-18 | |

| | | | | | | |
|-------------------|-----------------------|-----|-----------|---------|---------|--|
| Client ID: | TOSMO-20180201 | | | | | |
| Laboratory ID: | 02-016-12 | | | | | |
| Copper | 8.6 | 1.0 | EPA 200.8 | 2-13-18 | 2-13-18 | |
| Zinc | 78 | 5.0 | EPA 200.8 | 2-13-18 | 2-13-18 | |

| | | | | | | |
|-------------------|-----------------------|-----|-----------|---------|---------|--|
| Client ID: | TYLMI-20180201 | | | | | |
| Laboratory ID: | 02-016-13 | | | | | |
| Copper | 3.7 | 1.0 | EPA 200.8 | 2-13-18 | 2-13-18 | |
| Zinc | 14 | 5.0 | EPA 200.8 | 2-13-18 | 2-13-18 | |

| | | | | | | |
|-------------------|-----------------------|-----|-----------|---------|---------|--|
| Client ID: | TYLMO-20180201 | | | | | |
| Laboratory ID: | 02-016-14 | | | | | |
| Copper | 5.7 | 1.0 | EPA 200.8 | 2-13-18 | 2-13-18 | |
| Zinc | 28 | 5.0 | EPA 200.8 | 2-13-18 | 2-13-18 | |



Date of Report: February 23, 2018
Samples Submitted: February 2, 2018
Laboratory Reference: 1802-016
Project: 14-05806-000

TOTAL METALS
EPA 200.8

Matrix: Water
Units: ug/L (ppb)

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|-------------------|----------------------|------------|---------------|----------------------|----------------------|--------------|
| Client ID: | QA44-20180201 | | | | | |
| Laboratory ID: | 02-016-15 | | | | | |
| Copper | 2.1 | 1.0 | EPA 200.8 | 2-13-18 | 2-13-18 | |
| Zinc | 5.4 | 5.0 | EPA 200.8 | 2-13-18 | 2-13-18 | |



Date of Report: February 23, 2018
 Samples Submitted: February 2, 2018
 Laboratory Reference: 1802-016
 Project: 14-05806-000

**TOTAL METALS
 EPA 200.8
 QUALITY CONTROL**

Matrix: Water
 Units: ug/L (ppb)

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|---------------------|-----------|-----|-----------|---------------|---------------|-------|
| METHOD BLANK | | | | | | |
| Laboratory ID: | MB0213WH2 | | | | | |
| Copper | ND | 1.0 | EPA 200.8 | 2-13-18 | 2-13-18 | |
| Zinc | ND | 5.0 | EPA 200.8 | 2-13-18 | 2-13-18 | |

| Analyte | Result | Spike Level | Source Result | Percent Recovery | Recovery Limits | RPD | RPD Limit | Flags |
|------------------|-------------|-------------|---------------|------------------|-----------------|-----|-----------|-------|
| DUPLICATE | | | | | | | | |
| Laboratory ID: | 02-016-07 | | | | | | | |
| | ORIG | DUP | | | | | | |
| Copper | 2.70 | 2.56 | NA | NA | NA | NA | 5 | 20 |
| Zinc | 5.82 | 5.42 | NA | NA | NA | NA | 7 | 20 |

MATRIX SPIKES

| | | | | | | | | | | |
|----------------|------------|------------|-----|-----|------|------------|------------|--------|---|----|
| Laboratory ID: | 02-016-07 | | | | | | | | | |
| | MS | MSD | MS | MSD | | MS | MSD | | | |
| Copper | 109 | 106 | 100 | 100 | 2.70 | 107 | 103 | 75-125 | 3 | 20 |
| Zinc | 119 | 116 | 100 | 100 | 5.82 | 113 | 111 | 75-125 | 2 | 20 |



Date of Report: February 23, 2018
 Samples Submitted: February 2, 2018
 Laboratory Reference: 1802-016
 Project: 14-05806-000

**DISSOLVED METALS
 EPA 200.8**

Matrix: Water
 Units: ug/L (ppb)

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|-------------------|----------------------|-----|-----------|---------------|---------------|-------|
| Client ID: | COLM-20180201 | | | | | |
| Laboratory ID: | 02-016-01 | | | | | |
| Copper | ND | 1.0 | EPA 200.8 | | 2-9-18 | |
| Zinc | ND | 5.0 | EPA 200.8 | | 2-9-18 | |

| | | | | | | |
|-------------------|-----------------------|-----|-----------|--|--------|--|
| Client ID: | COUMI-20180201 | | | | | |
| Laboratory ID: | 02-016-02 | | | | | |
| Copper | 1.3 | 1.0 | EPA 200.8 | | 2-9-18 | |
| Zinc | ND | 5.0 | EPA 200.8 | | 2-9-18 | |

| | | | | | | |
|-------------------|-----------------------|-----|-----------|--|--------|--|
| Client ID: | COUMO-20180201 | | | | | |
| Laboratory ID: | 02-016-03 | | | | | |
| Copper | 2.1 | 1.0 | EPA 200.8 | | 2-9-18 | |
| Zinc | 9.4 | 5.0 | EPA 200.8 | | 2-9-18 | |

| | | | | | | |
|-------------------|-----------------------|-----|-----------|--|--------|--|
| Client ID: | EVAMS-20180201 | | | | | |
| Laboratory ID: | 02-016-04 | | | | | |
| Copper | ND | 1.0 | EPA 200.8 | | 2-9-18 | |
| Zinc | ND | 5.0 | EPA 200.8 | | 2-9-18 | |

| | | | | | | |
|-------------------|------------------------|-----|-----------|--|---------|--|
| Client ID: | EVALSS-20180201 | | | | | |
| Laboratory ID: | 02-016-05 | | | | | |
| Copper | 1.5 | 1.0 | EPA 200.8 | | 2-13-18 | |
| Zinc | ND | 5.0 | EPA 200.8 | | 2-13-18 | |

| | | | | | | |
|-------------------|-----------------------|-----|-----------|--|--------|--|
| Client ID: | MONMN-20180201 | | | | | |
| Laboratory ID: | 02-016-06 | | | | | |
| Copper | 8.8 | 1.0 | EPA 200.8 | | 2-9-18 | |
| Zinc | 9.4 | 5.0 | EPA 200.8 | | 2-9-18 | |

| | | | | | | |
|-------------------|-----------------------|-----|-----------|--|--------|--|
| Client ID: | MONMS-20180201 | | | | | |
| Laboratory ID: | 02-016-07 | | | | | |
| Copper | 1.6 | 1.0 | EPA 200.8 | | 2-9-18 | |
| Zinc | ND | 5.0 | EPA 200.8 | | 2-9-18 | |



Date of Report: February 23, 2018
 Samples Submitted: February 2, 2018
 Laboratory Reference: 1802-016
 Project: 14-05806-000

**DISSOLVED METALS
 EPA 200.8**

Matrix: Water
 Units: ug/L (ppb)

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|-------------------|----------------------|-----|-----------|---------------|---------------|-------|
| Client ID: | MONM-20180201 | | | | | |
| Laboratory ID: | 02-016-08 | | | | | |
| Copper | 1.4 | 1.0 | EPA 200.8 | | 2-9-18 | |
| Zinc | 6.5 | 5.0 | EPA 200.8 | | 2-9-18 | |

| | | | | | | |
|-------------------|-----------------------|-----|-----------|--|--------|--|
| Client ID: | SEIMN-20180201 | | | | | |
| Laboratory ID: | 02-016-09 | | | | | |
| Copper | ND | 1.0 | EPA 200.8 | | 2-9-18 | |
| Zinc | ND | 5.0 | EPA 200.8 | | 2-9-18 | |

| | | | | | | |
|-------------------|-----------------------|-----|-----------|--|--------|--|
| Client ID: | SEIMS-20180201 | | | | | |
| Laboratory ID: | 02-016-10 | | | | | |
| Copper | ND | 1.0 | EPA 200.8 | | 2-9-18 | |
| Zinc | ND | 5.0 | EPA 200.8 | | 2-9-18 | |

| | | | | | | |
|-------------------|-----------------------|-----|-----------|--|--------|--|
| Client ID: | TOSMI-20180201 | | | | | |
| Laboratory ID: | 02-016-11 | | | | | |
| Copper | 4.3 | 1.0 | EPA 200.8 | | 2-9-18 | |
| Zinc | 27 | 5.0 | EPA 200.8 | | 2-9-18 | |

| | | | | | | |
|-------------------|-----------------------|-----|-----------|--|--------|--|
| Client ID: | TOSMO-20180201 | | | | | |
| Laboratory ID: | 02-016-12 | | | | | |
| Copper | 3.2 | 1.0 | EPA 200.8 | | 2-9-18 | |
| Zinc | 16 | 5.0 | EPA 200.8 | | 2-9-18 | |

| | | | | | | |
|-------------------|-----------------------|-----|-----------|--|--------|--|
| Client ID: | TYLMI-20180201 | | | | | |
| Laboratory ID: | 02-016-13 | | | | | |
| Copper | 2.5 | 1.0 | EPA 200.8 | | 2-9-18 | |
| Zinc | 8.1 | 5.0 | EPA 200.8 | | 2-9-18 | |

| | | | | | | |
|-------------------|-----------------------|-----|-----------|--|--------|--|
| Client ID: | TYLMO-20180201 | | | | | |
| Laboratory ID: | 02-016-14 | | | | | |
| Copper | 1.7 | 1.0 | EPA 200.8 | | 2-9-18 | |
| Zinc | ND | 5.0 | EPA 200.8 | | 2-9-18 | |



Date of Report: February 23, 2018
Samples Submitted: February 2, 2018
Laboratory Reference: 1802-016
Project: 14-05806-000

DISSOLVED METALS
EPA 200.8

Matrix: Water
Units: ug/L (ppb)

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|-------------------|----------------------|------------|---------------|----------------------|----------------------|--------------|
| Client ID: | QA44-20180201 | | | | | |
| Laboratory ID: | 02-016-15 | | | | | |
| Copper | 2.6 | 1.0 | EPA 200.8 | | 2-13-18 | |
| Zinc | ND | 5.0 | EPA 200.8 | | 2-13-18 | |



Date of Report: February 23, 2018
 Samples Submitted: February 2, 2018
 Laboratory Reference: 1802-016
 Project: 14-05806-000

**DISSOLVED METALS
 EPA 200.8
 QUALITY CONTROL**

Matrix: Water
 Units: ug/L (ppb)

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|---------------------|-----------|-----|-----------|---------------|---------------|-------|
| METHOD BLANK | | | | | | |
| Laboratory ID: | MB0209D1 | | | | | |
| Copper | ND | 1.0 | EPA 200.8 | | 2-9-18 | |
| Zinc | ND | 5.0 | EPA 200.8 | | 2-9-18 | |

| Analyte | Result | | Spike Level | | Source Result | Percent Recovery | Recovery Limits | RPD | RPD Limit | Flags |
|------------------|-------------|-------------|-------------|----|---------------|------------------|-----------------|-----|-----------|-------|
| DUPLICATE | | | | | | | | | | |
| Laboratory ID: | 02-016-06 | | | | | | | | | |
| | ORIG | DUP | | | | | | | | |
| Copper | 8.78 | 8.30 | NA | NA | | NA | NA | 6 | 20 | |
| Zinc | 9.36 | 8.82 | NA | NA | | NA | NA | 6 | 20 | |

MATRIX SPIKES

| | | | | | | | | | | |
|----------------|-------------|-------------|------|------|------|-----------|------------|--------|---|----|
| Laboratory ID: | 02-016-06 | | | | | | | | | |
| | MS | MSD | MS | MSD | | MS | MSD | | | |
| Copper | 86.0 | 83.8 | 80.0 | 80.0 | 8.78 | 97 | 94 | 75-125 | 3 | 20 |
| Zinc | 88.2 | 90.2 | 80.0 | 80.0 | 9.36 | 99 | 101 | 75-125 | 2 | 20 |





Data Qualifiers and Abbreviations

- A - Due to a high sample concentration, the amount spiked is insufficient for meaningful MS/MSD recovery data.
 - B - The analyte indicated was also found in the blank sample.
 - C - The duplicate RPD is outside control limits due to high result variability when analyte concentrations are within five times the quantitation limit.
 - E - The value reported exceeds the quantitation range and is an estimate.
 - F - Surrogate recovery data is not available due to the high concentration of coeluting target compounds.
 - H - The analyte indicated is a common laboratory solvent and may have been introduced during sample preparation, and be impacting the sample result.
 - I - Compound recovery is outside of the control limits.
 - J - The value reported was below the practical quantitation limit. The value is an estimate.
 - K - Sample duplicate RPD is outside control limits due to sample inhomogeneity. The sample was re-extracted and re-analyzed with similar results.
 - L - The RPD is outside of the control limits.
 - M - Hydrocarbons in the gasoline range are impacting the diesel range result.
 - M1 - Hydrocarbons in the gasoline range (toluene-naphthalene) are present in the sample.
 - N - Hydrocarbons in the lube oil range are impacting the diesel range result.
 - N1 - Hydrocarbons in diesel range are impacting lube oil range results.
 - O - Hydrocarbons indicative of heavier fuels are present in the sample and are impacting the gasoline result.
 - P - The RPD of the detected concentrations between the two columns is greater than 40.
 - Q - Surrogate recovery is outside of the control limits.
 - S - Surrogate recovery data is not available due to the necessary dilution of the sample.
 - T - The sample chromatogram is not similar to a typical _____.
 - U - The analyte was analyzed for, but was not detected above the reported sample quantitation limit.
 - U1 - The practical quantitation limit is elevated due to interferences present in the sample.
 - V - Matrix Spike/Matrix Spike Duplicate recoveries are outside control limits due to matrix effects.
 - W - Matrix Spike/Matrix Spike Duplicate RPD are outside control limits due to matrix effects.
 - X - Sample extract treated with a mercury cleanup procedure.
 - X1 - Sample extract treated with a sulfuric acid/silica gel cleanup procedure.
 - Y - The calibration verification for this analyte exceeded the 20% drift specified in method 8260C, and therefore the reported result should be considered an estimate. The overall performance of the calibration verification standard met the acceptance criteria of the method.
 - Z -
- ND - Not Detected at PQL
 PQL - Practical Quantitation Limit
 RPD - Relative Percent Difference





Am Test Inc.
13600 NE 126TH PL
Suite C
Kirkland, WA 98034
(425) 885-1664

**Professional
Analytical
Services**

Feb 16 2018
On-Site Environmental
14648 NE 95th ST
Redmond, WA 98052
Attention: David Baumeister

Dear David Baumeister:

Enclosed please find the analytical data for your REDMON PAIRED WATERSHED STUDY project.

The following is a cross correlation of client and laboratory identifications for your convenience.

| CLIENT ID | MATRIX | AMTEST ID | TEST |
|-----------------|--------|------------|------------|
| COLM-20180201 | Water | 18-A002146 | Micro, NUT |
| COUMI-20180201 | Water | 18-A002147 | Micro, NUT |
| COUMO-20180201 | Water | 18-A002148 | Micro, NUT |
| EVAMS-20180201 | Water | 18-A002149 | Micro, NUT |
| EVALSS-20180201 | Water | 18-A002150 | Micro, NUT |
| MONMN-20180201 | Water | 18-A002151 | Micro, NUT |
| MONMS-20180201 | Water | 18-A002152 | Micro, NUT |
| MONM-20180201 | Water | 18-A002153 | Micro, NUT |
| SEIMN-20180201 | Water | 18-A002154 | Micro, NUT |
| SEIMS-20180201 | Water | 18-A002155 | Micro, NUT |
| TOSMI-20180201 | Water | 18-A002156 | Micro, NUT |
| TOSMO-20180201 | Water | 18-A002157 | Micro, NUT |
| TYLMI-20180201 | Water | 18-A002158 | Micro, NUT |
| TYLMO-20180201 | Water | 18-A002159 | Micro, NUT |
| QA44-20180201 | Water | 18-A002160 | Micro, NUT |

Your samples were received on Friday, February 2, 2018. At the time of receipt, the samples were logged in and properly maintained prior to the subsequent analysis.

The analytical procedures used at AmTest are well documented and are typically derived from the protocols of the EPA, USDA, FDA or the Army Corps of Engineers.

Following the analytical data you will find the Quality Control (QC) results.

Please note that the detection limits that are listed in the body of the report refer to the Practical Quantitation Limits (PQL's), as opposed to the Method Detection Limits (MDL's).

Am Test Inc.
13600 NE 126TH PL
Suite C
Kirkland, WA 98034
(425) 885-1664

**Professional
Analytical
Services**

Feb 16 2018
On-Site Environmental
continued . . .

If you should have any questions pertaining to the data package, please feel free to contact me.

Sincerely,


Aaron W. Young
Laboratory Manager

Project #: 14-05806-000
PO Number: 02-016

BACT = Bacteriological
CONV = Conventional

MET = Metals
ORG = Organics

NUT=Nutrients
DEM=Demand

MIN=Minerals

Am Test Inc.
 13600 NE 126TH PL
 Suite C
 Kirkland, WA 98034
 (425) 885-1664
 www.amtestlab.com



Professional
 Analytical
 Services

ANALYSIS REPORT

On-Site Environmental
 14648 NE 95th ST
 Redmond, WA 98052
 Attention: David Baumeister
 Project Name: REDMON PAIRED WATERSHED STUDY
 Project #: 14-05806-000
 PO Number: 02-016
 All results reported on an as received basis.

Date Received: 02/02/18
 Date Reported: 2/16/18

AMTEST Identification Number 18-A002146
 Client Identification COLM-20180201
 Sampling Date 02/01/18, 19:05

Microbiological

| PARAMETER | RESULT | UNITS | Q | D.L. | METHOD | ANALYST | DATE / TIME |
|----------------|--------|------------|---|------|----------|---------|----------------|
| Fecal Coliform | 5. | CFU/100 ml | | 1 | SM 9222D | NG | 02/02/18 16:00 |

Nutrients

| PARAMETER | RESULT | UNITS | Q | D.L. | METHOD | ANALYST | DATE |
|--------------------------|--------|-------|---|------|-----------|---------|----------|
| Total Nitrogen (NOX&TKN) | 0.77 | mg/l | | 0.1 | | | |
| Total Nitrogen (TKN) | 0.773 | mg/l | | 0.1 | EPA 351.2 | JC | 02/15/18 |
| Nitrate + Nitrite | < 0.01 | mg/l | | 0.01 | EPA 353.2 | JC | 02/02/18 |

AMTEST Identification Number 18-A002147
Client Identification COUMI-20180201
Sampling Date 02/01/18, 17:25

Microbiological

| PARAMETER | RESULT | UNITS | Q | D.L. | METHOD | ANALYST | DATE / TIME |
|----------------|--------|------------|---|------|----------|---------|----------------|
| Fecal Coliform | 740 | CFU/100 ml | | 1 | SM 9222D | NG | 02/02/18 16:00 |

Nutrients

| PARAMETER | RESULT | UNITS | Q | D.L. | METHOD | ANALYST | DATE |
|--------------------------|--------|-------|---|------|-----------|---------|----------|
| Total Nitrogen (NOX&TKN) | 1.16 | mg/l | | 0.1 | | | |
| Total Nitrogen (TKN) | 1.00 | mg/l | | 0.1 | EPA 351.2 | JC | 02/15/18 |
| Nitrate + Nitrite | 0.16 | mg/l | | 0.01 | EPA 353.2 | JC | 02/02/18 |

AMTEST Identification Number 18-A002148
Client Identification COUMO-20180201
Sampling Date 02/01/18, 17:10

Microbiological

| PARAMETER | RESULT | UNITS | Q | D.L. | METHOD | ANALYST | DATE / TIME |
|----------------|--------|------------|---|------|----------|---------|----------------|
| Fecal Coliform | 300 | CFU/100 ml | | 1 | SM 9222D | NG | 02/02/18 16:00 |

Nutrients

| PARAMETER | RESULT | UNITS | Q | D.L. | METHOD | ANALYST | DATE |
|--------------------------|--------|-------|---|------|-----------|---------|----------|
| Total Nitrogen (NOX&TKN) | 0.79 | mg/l | | 0.1 | | | |
| Total Nitrogen (TKN) | 0.523 | mg/l | | 0.1 | EPA 351.2 | JC | 02/15/18 |
| Nitrate + Nitrite | 0.27 | mg/l | | 0.01 | EPA 353.2 | JC | 02/02/18 |

AMTEST Identification Number 18-A002149
Client Identification EVAMS-20180201
Sampling Date 02/01/18, 18:00

Microbiological

| PARAMETER | RESULT | UNITS | Q | D.L. | METHOD | ANALYST | DATE / TIME |
|----------------|--------|------------|---|------|----------|---------|----------------|
| Fecal Coliform | 60. | CFU/100 ml | | 1 | SM 9222D | NG | 02/02/18 16:00 |

Nutrients

| PARAMETER | RESULT | UNITS | Q | D.L. | METHOD | ANALYST | DATE |
|--------------------------|--------|-------|---|------|-----------|---------|----------|
| Total Nitrogen (NOX&TKN) | 1.96 | mg/l | | 0.1 | | | |
| Total Nitrogen (TKN) | 0.560 | mg/l | | 0.1 | EPA 351.2 | JC | 02/15/18 |
| Nitrate + Nitrite | 1.4 | mg/l | | 0.01 | EPA 353.2 | JC | 02/02/18 |

On-Site Environmental
Project Name: REDMON PAIRED WATERSHED STUDY
AmTest ID: 18-A002150

AMTEST Identification Number 18-A002150
Client Identification EVALSS-20180201
Sampling Date 02/01/18, 18:20

Microbiological

| PARAMETER | RESULT | UNITS | Q | D.L. | METHOD | ANALYST | DATE / TIME |
|----------------|--------|------------|---|------|----------|---------|----------------|
| Fecal Coliform | 45. | CFU/100 ml | | 1 | SM 9222D | NG | 02/02/18 16:00 |

Nutrients

| PARAMETER | RESULT | UNITS | Q | D.L. | METHOD | ANALYST | DATE |
|--------------------------|--------|-------|---|------|-----------|---------|----------|
| Total Nitrogen (NOX&TKN) | 1.92 | mg/l | | 0.1 | | | |
| Total Nitrogen (TKN) | 0.617 | mg/l | | 0.1 | EPA 351.2 | JC | 02/15/18 |
| Nitrate + Nitrite | 1.3 | mg/l | | 0.01 | EPA 353.2 | JC | 02/02/18 |

AMTEST Identification Number 18-A002151
Client Identification MONMN-20180201
Sampling Date 02/01/18, 18:55

Microbiological

| PARAMETER | RESULT | UNITS | Q | D.L. | METHOD | ANALYST | DATE / TIME |
|----------------|--------|------------|---|------|----------|---------|----------------|
| Fecal Coliform | 65. | CFU/100 ml | | 1 | SM 9222D | NG | 02/02/18 16:00 |

Nutrients

| PARAMETER | RESULT | UNITS | Q | D.L. | METHOD | ANALYST | DATE |
|--------------------------|--------|-------|---|------|-----------|---------|----------|
| Total Nitrogen (NOX&TKN) | 0.75 | mg/l | | 0.1 | | | |
| Total Nitrogen (TKN) | 0.546 | mg/l | | 0.1 | EPA 351.2 | JC | 02/15/18 |
| Nitrate + Nitrite | 0.20 | mg/l | | 0.01 | EPA 353.2 | JC | 02/02/18 |

AMTEST Identification Number 18-A002152
Client Identification MONMS-20180201
Sampling Date 02/01/18, 19:15

Microbiological

| PARAMETER | RESULT | UNITS | Q | D.L. | METHOD | ANALYST | DATE / TIME |
|----------------|--------|------------|---|------|----------|---------|----------------|
| Fecal Coliform | 480 | CFU/100 ml | | 1 | SM 9222D | NG | 02/02/18 16:00 |

Nutrients

| PARAMETER | RESULT | UNITS | Q | D.L. | METHOD | ANALYST | DATE |
|--------------------------|--------|-------|---|------|-----------|---------|----------|
| Total Nitrogen (NOX&TKN) | 0.82 | mg/l | | 0.1 | | | |
| Total Nitrogen (TKN) | 0.435 | mg/l | | 0.1 | EPA 351.2 | JC | 02/15/18 |
| Nitrate + Nitrite | 0.38 | mg/l | | 0.01 | EPA 353.2 | JC | 02/02/18 |

AMTEST Identification Number 18-A002153
Client Identification MONM-20180201
Sampling Date 02/01/18, 20:25

Microbiological

| PARAMETER | RESULT | UNITS | Q | D.L. | METHOD | ANALYST | DATE / TIME |
|----------------|--------|------------|---|------|----------|---------|----------------|
| Fecal Coliform | 70. | CFU/100 ml | | 1 | SM 9222D | NG | 02/02/18 16:00 |

Nutrients

| PARAMETER | RESULT | UNITS | Q | D.L. | METHOD | ANALYST | DATE |
|--------------------------|--------|-------|---|------|-----------|---------|----------|
| Total Nitrogen (NOX&TKN) | 0.95 | mg/l | | 0.1 | | | |
| Total Nitrogen (TKN) | 0.652 | mg/l | | 0.1 | EPA 351.2 | JC | 02/15/18 |
| Nitrate + Nitrite | 0.30 | mg/l | | 0.01 | EPA 353.2 | JC | 02/02/18 |

AMTEST Identification Number 18-A002154
Client Identification SEIMN-20180201
Sampling Date 02/01/18, 19:05

Microbiological

| PARAMETER | RESULT | UNITS | Q | D.L. | METHOD | ANALYST | DATE / TIME |
|----------------|--------|------------|---|------|----------|---------|----------------|
| Fecal Coliform | 35. | CFU/100 ml | | 1 | SM 9222D | NG | 02/02/18 16:00 |

Nutrients

| PARAMETER | RESULT | UNITS | Q | D.L. | METHOD | ANALYST | DATE |
|--------------------------|--------|-------|---|------|-----------|---------|----------|
| Total Nitrogen (NOX&TKN) | 0.71 | mg/l | | 0.1 | | | |
| Total Nitrogen (TKN) | 0.561 | mg/l | | 0.1 | EPA 351.2 | JC | 02/15/18 |
| Nitrate + Nitrite | 0.15 | mg/l | | 0.01 | EPA 353.2 | JC | 02/02/18 |

AMTEST Identification Number 18-A002155
Client Identification SEIMS-20180201
Sampling Date 02/01/18, 20:00

Microbiological

| PARAMETER | RESULT | UNITS | Q | D.L. | METHOD | ANALYST | DATE / TIME |
|----------------|--------|------------|---|------|----------|---------|----------------|
| Fecal Coliform | 130 | CFU/100 ml | | 1 | SM 9222D | NG | 02/02/18 16:00 |

Nutrients

| PARAMETER | RESULT | UNITS | Q | D.L. | METHOD | ANALYST | DATE |
|--------------------------|--------|-------|---|------|-----------|---------|----------|
| Total Nitrogen (NOX&TKN) | 0.95 | mg/l | | 0.1 | | | |
| Total Nitrogen (TKN) | 0.867 | mg/l | | 0.1 | EPA 351.2 | JC | 02/15/18 |
| Nitrate + Nitrite | 0.082 | mg/l | | 0.01 | EPA 353.2 | JC | 02/02/18 |

AMTEST Identification Number 18-A002156
Client Identification TOSMI-20180201
Sampling Date 02/01/18, 17:10

Microbiological

| PARAMETER | RESULT | UNITS | Q | D.L. | METHOD | ANALYST | DATE / TIME |
|----------------|--------|------------|---|------|----------|---------|----------------|
| Fecal Coliform | 580 | CFU/100 ml | | 1 | SM 9222D | NG | 02/02/18 16:00 |

Nutrients

| PARAMETER | RESULT | UNITS | Q | D.L. | METHOD | ANALYST | DATE |
|--------------------------|--------|-------|---|------|-----------|---------|----------|
| Total Nitrogen (NOX&TKN) | 0.82 | mg/l | | 0.1 | | | |
| Total Nitrogen (TKN) | 0.675 | mg/l | | 0.1 | EPA 351.2 | JC | 02/15/18 |
| Nitrate + Nitrite | 0.14 | mg/l | | 0.01 | EPA 353.2 | JC | 02/02/18 |

AMTEST Identification Number 18-A002157
Client Identification TOSMO-20180201
Sampling Date 02/01/18, 17:50

Microbiological

| PARAMETER | RESULT | UNITS | Q | D.L. | METHOD | ANALYST | DATE / TIME |
|----------------|--------|------------|---|------|----------|---------|----------------|
| Fecal Coliform | 400 | CFU/100 ml | | 1 | SM 9222D | NG | 02/02/18 16:00 |

Nutrients

| PARAMETER | RESULT | UNITS | Q | D.L. | METHOD | ANALYST | DATE |
|--------------------------|--------|-------|---|------|-----------|---------|----------|
| Total Nitrogen (NOX&TKN) | 0.81 | mg/l | | 0.1 | | | |
| Total Nitrogen (TKN) | 0.690 | mg/l | | 0.1 | EPA 351.2 | JC | 02/15/18 |
| Nitrate + Nitrite | 0.12 | mg/l | | 0.01 | EPA 353.2 | JC | 02/02/18 |

AMTEST Identification Number 18-A002158
Client Identification TYLMI-20180201
Sampling Date 02/01/18, 18:35

Microbiological

| PARAMETER | RESULT | UNITS | Q | D.L. | METHOD | ANALYST | DATE / TIME |
|----------------|--------|------------|---|------|----------|---------|----------------|
| Fecal Coliform | 120 | CFU/100 ml | | 1 | SM 9222D | NG | 02/02/18 16:00 |

Nutrients

| PARAMETER | RESULT | UNITS | Q | D.L. | METHOD | ANALYST | DATE |
|--------------------------|--------|-------|---|------|-----------|---------|----------|
| Total Nitrogen (NOX&TKN) | 0.66 | mg/l | | 0.1 | | | |
| Total Nitrogen (TKN) | 0.586 | mg/l | | 0.1 | EPA 351.2 | JC | 02/15/18 |
| Nitrate + Nitrite | 0.072 | mg/l | | 0.01 | EPA 353.2 | JC | 02/02/18 |

AMTEST Identification Number 18-A002159
Client Identification TYLMO-20180201
Sampling Date 02/01/18, 18:20

Microbiological

| PARAMETER | RESULT | UNITS | Q | D.L. | METHOD | ANALYST | DATE / TIME |
|----------------|--------|------------|---|------|----------|---------|----------------|
| Fecal Coliform | 220 | CFU/100 ml | | 1 | SM 9222D | NG | 02/02/18 16:00 |

Nutrients

| PARAMETER | RESULT | UNITS | Q | D.L. | METHOD | ANALYST | DATE |
|--------------------------|--------|-------|---|------|-----------|---------|----------|
| Total Nitrogen (NOX&TKN) | 0.78 | mg/l | | 0.1 | | | |
| Total Nitrogen (TKN) | 0.784 | mg/l | | 0.1 | EPA 351.2 | JC | 02/15/18 |
| Nitrate + Nitrite | < 0.01 | mg/l | | 0.01 | EPA 353.2 | JC | 02/02/18 |

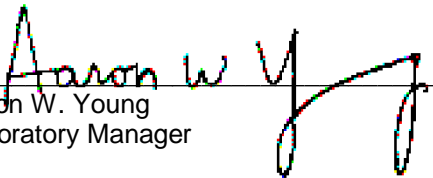
AMTEST Identification Number 18-A002160
Client Identification QA44-20180201
Sampling Date 02/01/18, 19:20

Microbiological

| PARAMETER | RESULT | UNITS | Q | D.L. | METHOD | ANALYST | DATE / TIME |
|----------------|--------|------------|---|------|----------|---------|----------------|
| Fecal Coliform | 210 | CFU/100 ml | | 1 | SM 9222D | NG | 02/02/18 16:00 |

Nutrients

| PARAMETER | RESULT | UNITS | Q | D.L. | METHOD | ANALYST | DATE |
|--------------------------|--------|-------|---|------|-----------|---------|----------|
| Total Nitrogen (NOX&TKN) | 0.53 | mg/l | | 0.1 | | | |
| Total Nitrogen (TKN) | 0.503 | mg/l | | 0.1 | EPA 351.2 | JC | 02/15/18 |
| Nitrate + Nitrite | 0.031 | mg/l | | 0.01 | EPA 353.2 | JC | 02/02/18 |


Aaron W. Young
Laboratory Manager

QC Summary for sample numbers: 18-A002146 to 18-A002160

DUPLICATES

| SAMPLE # | ANALYTE | UNITS | SAMPLE VALUE | DUP VALUE | RPD |
|------------|----------------------|------------|--------------|-----------|------|
| 18-A002146 | Fecal Coliform | CFU/100 ml | 5. | < 5 | |
| 18-A002160 | Fecal Coliform | CFU/100 ml | 210 | 300 | 35. |
| 18-A001892 | Total Nitrogen (TKN) | mg/l | < 0.1 | < 0.1 | |
| 18-A002141 | Total Nitrogen (TKN) | mg/l | 36.0 | 41.2 | 13. |
| 18-A002151 | Total Nitrogen (TKN) | mg/l | 0.546 | 0.555 | 1.6 |
| 18-A002160 | Total Nitrogen (TKN) | mg/l | 0.503 | 0.440 | 13. |
| 18-A002470 | Total Nitrogen (TKN) | mg/l | 2.70 | 2.70 | 0.00 |
| 18-A002143 | Nitrate + Nitrite | mg/l | 0.54 | 0.53 | 1.9 |
| 18-A002153 | Nitrate + Nitrite | mg/l | 0.30 | 0.30 | 0.00 |
| 18-A002163 | Nitrate + Nitrite | mg/l | 1.6 | 1.6 | 0.00 |
| 18-A002173 | Nitrate + Nitrite | mg/l | 0.28 | 0.30 | 6.9 |

MATRIX SPIKES

| SAMPLE # | ANALYTE | UNITS | SAMPLE VALUE | SMPL+ SPK | SPK AMT | RECOVERY |
|------------|----------------------|-------|--------------|-----------|---------|----------|
| 18-A001892 | Total Nitrogen (TKN) | mg/l | < 0.1 | 1.07 | 1.00 | 107.00 % |
| 18-A002141 | Total Nitrogen (TKN) | mg/l | 36.0 | 53.0 | 25.0 | 68.00 % |
| 18-A002151 | Total Nitrogen (TKN) | mg/l | 0.546 | 1.60 | 1.00 | 105.40 % |
| 18-A002160 | Total Nitrogen (TKN) | mg/l | 0.503 | 1.54 | 1.00 | 103.70 % |
| 18-A002470 | Total Nitrogen (TKN) | mg/l | 2.70 | 4.00 | 1.00 | 130.00 % |
| 18-A002143 | Nitrate + Nitrite | mg/l | 0.54 | 1.6 | 1.0 | 106.00 % |
| 18-A002153 | Nitrate + Nitrite | mg/l | 0.30 | 1.3 | 1.0 | 100.00 % |
| 18-A002173 | Nitrate + Nitrite | mg/l | 0.28 | 1.3 | 1.0 | 102.00 % |

STANDARD REFERENCE MATERIALS

| ANALYTE | UNITS | TRUE VALUE | MEASURED VALUE | RECOVERY |
|----------------------|-------|------------|----------------|----------|
| Total Nitrogen (TKN) | mg/l | 1.00 | 1.01 | 101. % |
| Total Nitrogen (TKN) | mg/l | 1.00 | 1.01 | 101. % |
| Nitrate + Nitrite | mg/l | 1.0 | 0.98 | 98.0 % |
| Nitrate + Nitrite | mg/l | 1.0 | 0.98 | 98.0 % |

BLANKS

| ANALYTE | UNITS | RESULT |
|----------------------|------------|--------|
| Fecal Coliform | CFU/100 ml | < 1 |
| Fecal Coliform | CFU/100 ml | < 1 |
| Total Nitrogen (TKN) | mg/l | < 0.1 |
| Total Nitrogen (TKN) | mg/l | < 0.1 |
| Nitrate + Nitrite | mg/l | < 0.01 |
| Nitrate + Nitrite | mg/l | < 0.01 |



14648 NE 95th Street, Redmond, WA 98052 · (425) 883-3881

Laboratory: AmTest Laboratories

Attention: Aaron Young

13600 NE 126th PI Kirkland, WA 98034

Phone Number: (425) 885-1664

Turnaround Request

1 Day 2 Day 3 Day

Standard

Other: _____

Laboratory Reference #: 02-016

Project Manager: Blair Goodrow

email: bgoodrow@onsite-env.com

Project Number: 14-05806-000

Project Name: Redmond Paired Watershed Study

| Lab ID | Sample Identification | Date Sampled | Time Sampled | Matrix | # of Cont. | Requested Analyses |
|-------------------------------------|-----------------------|-------------------|--------------|---------------|-------------|---|
| 2140 47 1 | COLM-20180201 | 2/1/18 | 19:05 | Water | 2 | Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N |
| 2 | COUMI-20180201 | 2/1/18 | 17:25 | Water | 2 | Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N |
| 48 49 3 | COUMO-20180201 | 2/1/18 | 17:10 | Water | 2 | Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N |
| 4 | EVAMS-20180201 | 2/1/18 | 18:00 | Water | 2 | Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N |
| 50 51 5 | EVALSS-20180201 | 2/1/18 | 18:20 | Water | 2 | Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N |
| 6 | MONMN-20180201 | 2/1/18 | 18:55 | Water | 2 | Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N |
| 52 7 | MONMS-20180201 | 2/1/18 | 19:15 | Water | 2 | Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N |
| 53 8 | MONM-20180201 | 2/1/18 | 20:25 | Water | 2 | Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N |
| 54 9 | SEIMN-20180201 | 2/1/18 | 19:05 | Water | 2 | Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N |
| 55 10 | SEIMS-20180201 | 2/1/18 | 20:00 | Water | 2 | Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N |
| Signature | | Company | | Date | Time | Comments/Special Instructions |
| Relinquished by: <i>[Signature]</i> | | <i>COASTAL TO</i> | | <i>2/2/18</i> | <i>1245</i> | EDDs - CSV Reporting Limits: Fecal Coliform - 1.0 cfu/100ml Total Nitrogen - .10 mg/L |
| Received by: <i>[Signature]</i> | | <i>T-8.1</i> | | <i>2/2/18</i> | <i>1245</i> | |
| Relinquished by: | | | | | | |
| Received by: | | | | | | |
| Relinquished by: | | | | | | |
| Received by: | | | | | | |



14648 NE 95th Street, Redmond, WA 98052 · (425) 883-3881

Laboratory: AmTest Laboratories

Attention: Aaron Young

13600 NE 126th PI Kirkland, WA 98034

Phone Number: (425) 885-1664

Turnaround Request
 1 Day 2 Day 3 Day
 Standard
 Other: _____

Laboratory Reference #: 02-016

Project Manager: Blair Goodrow

email: bgoodrow@onsite-env.com

Project Number: 14-05806-000

Project Name: Redmond Paired Watershed Study

| Lab ID | Sample Identification | Date Sampled | Time Sampled | Matrix | # of Cont. | Requested Analyses |
|------------------------------------|-----------------------|--------------|--------------|--------|------------|--|
| 2156 57 58 59 60 11 | TOSMI-20180201 | 2/1/18 | 17:10 | Water | 2 | Faecal Coliform SM 9222D, Total Nitrogen SM 4500-N |
| 12 | TOSMO-20180201 | 2/1/18 | 17:50 | Water | 2 | Faecal Coliform SM 9222D, Total Nitrogen SM 4500-N |
| 13 | TYLMI-20180201 | 2/1/18 | 18:35 | Water | 2 | Faecal Coliform SM 9222D, Total Nitrogen SM 4500-N |
| 14 | TYLMO-20180201 | 2/1/18 | 18:20 | Water | 2 | Faecal Coliform SM 9222D, Total Nitrogen SM 4500-N |
| 15 | QA44-20180201 | 2/1/18 | 19:20 | Water | 2 | Faecal Coliform SM 9222D, Total Nitrogen SM 4500-N |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |

| Signature | Company | Date | Time | Comments/Special Instructions |
|--------------------|--------------------|--------|------|---|
| <i>[Signature]</i> | OnSite Env | 2/2/18 | 1245 | EDDs - CSV Reporting Limits: Faecal Coliform - 1.0 cfu/100ml Total Nitrogen - .10 mg/L |
| Relinquished by: | <i>[Signature]</i> | 2/2/18 | 1245 | |
| Received by: | T-8.1 | 2/2/18 | 1245 | |
| Relinquished by: | | | | |
| Received by: | | | | |
| Relinquished by: | | | | |
| Received by: | | | | |



14648 NE 95th Street, Redmond, WA 98052
Telephone: 425.883.3881

Company: Herrera Environmental Consultants

Project No.: 14-05806-000

Project Name: Redmond Paired Watershed Study

Project Manager: George Iftner

CHAIN OF CUSTODY

Turnaround Requested:

- 1 Day
- 2 Day
- 3 Day
- Standard

Laboratory No.

02-016

Requested Analyses

| Lab ID | Sample Identification | Date Sampled | Time Sampled | Matrix | # of Cont. | Total Suspended Solids (SM 2540D) | Turbidity (EPA 181.1) | Hardness (EPA 200.7 / SM 2340B) | Dissolved Organ Carbon (SM 5310B) * | Fecal Coliform (SM 9222D) | Total Phosphorus (EPA 365.1) | Total Nitrogen (SM 4500 N-B) | Total Cu and Zn (EPA 200.8) | Dissolved Cu and Zn (EPA 200.8) * |
|--------|-----------------------|--------------|--------------|--------|------------|-----------------------------------|-----------------------|---------------------------------|-------------------------------------|---------------------------|------------------------------|------------------------------|-----------------------------|-----------------------------------|
| 1 | COLM-2018 0201 | 2/1/18 | 19:05 | Water | 7 | X | X | X | X | X | X | X | X | X |
| 2 | COUMI-2018 0201 | | 17:25 | Water | 7 | X | X | X | X | X | X | X | X | X |
| 3 | COUMO-2018 0201 | | 17:10 | Water | 7 | X | X | X | X | X | X | X | X | X |
| 4 | EVAMS-2018 0201 | | 18:00 | Water | 7 | X | X | X | X | X | X | X | X | X |
| 5 | EVALSS-2018 0201 | | 18:20 | Water | 7 | X | X | X | X | X | X | X | X | X |
| 6 | MONMN-2018 0201 | | 18:55 | Water | 7 | X | X | X | X | X | X | X | X | X |
| 7 | MONMS-2018 0201 | | 19:15 | Water | 7 | X | X | X | X | X | X | X | X | X |
| 8 | MONM-2018 0201 | | 20:25 | Water | 7 | X | X | X | X | X | X | X | X | X |
| 9 | SEIMN-2018 0201 | | 19:05 | Water | 7 | X | X | X | X | X | X | X | X | X |
| 10 | SEIMS-2018 0201 | | 20:00 | Water | 7 | X | X | X | X | X | X | X | X | X |
| 11 | TOSMI-2018 0201 | | 17:10 | Water | 7 | X | X | X | X | X | X | X | X | X |
| 12 | TOSMO-2018 0201 | | 17:50 | Water | 7 | X | X | X | X | X | X | X | X | X |
| 13 | TYLMI-2018 0201 | | 18:35 | Water | 7 | X | X | X | X | X | X | X | X | X |
| 14 | TYLMO-2018 0201 | | 18:20 | Water | 7 | X | X | X | X | X | X | X | X | X |
| 15 | QA 44-2018 0201 | | 19:20 | Water | 7 | X | X | X | X | X | X | X | X | X |

Relinquished by Nahn ml Date 2/2/18 Received by Oliver Hjaltal Date 2-2-18
 Firm Herrera Time 10:00 Firm ALPHA Time 9:55AM
 Relinquished by Oliver Hjaltal Date 2/2/18 Received by [Signature] Date 2/2/18
 Firm ALPHA Time 12:20p Firm OBE Time 1220

Comments:
 * - field filtered with 0.45 µm filter within 15 minutes of collecting sample



CHAIN OF CUSTODY

14648 NE 95th Street, Redmond, WA 98052
 Telephone: 425.883.3881

Company: Herrera Environmental Consultants

Project No.: 14-05806-000

Project Name: Redmond Paired Watershed Study

Project Manager: George Ifner

Turnaround Requested:
 1 Day
 2 Day
 3 Day
 Standard

Laboratory No. _____
 Requested Analyses _____

| | | | | | | | | | | | | | | | | | | |
|-----------------------------------|-----------------------|---------------------------------|-------------------------------------|---------------------------|------------------------------|------------------------------|-----------------------------|-----------------------------------|--|--|--|--|--|--|--|--|--|--|
| Total Suspended Solids (SM 2540D) | Turbidity (EPA 181.1) | Hardness (EPA 200.7 / SM 2340B) | Dissolved Organ Carbon (SM 5310B) * | Fecal Coliform (SM 9222D) | Total Phosphorus (EPA 365.1) | Total Nitrogen (SM 4500 N-B) | Total Cu and Zn (EPA 200.8) | Dissolved Cu and Zn (EPA 200.8) * | | | | | | | | | | |
|-----------------------------------|-----------------------|---------------------------------|-------------------------------------|---------------------------|------------------------------|------------------------------|-----------------------------|-----------------------------------|--|--|--|--|--|--|--|--|--|--|

| Lab ID | Sample Identification | Date Sampled | Time Sampled | Matrix | # of Cont. | Total Suspended Solids (SM 2540D) | Turbidity (EPA 181.1) | Hardness (EPA 200.7 / SM 2340B) | Dissolved Organ Carbon (SM 5310B) * | Fecal Coliform (SM 9222D) | Total Phosphorus (EPA 365.1) | Total Nitrogen (SM 4500 N-B) | Total Cu and Zn (EPA 200.8) | Dissolved Cu and Zn (EPA 200.8) * | | | | |
|--------|-----------------------|--------------|--------------|--------|------------|-----------------------------------|-----------------------|---------------------------------|-------------------------------------|---------------------------|------------------------------|------------------------------|-----------------------------|-----------------------------------|--|--|--|--|
| 1 | COLM-2018 0201 | 2/1/18 | 19:05 | Water | 7 | X | X | X | X | X | X | X | X | X | | | | |
| 2 | COUMI-2018 0201 | | 17:25 | Water | 7 | X | X | X | X | X | X | X | X | X | | | | |
| 3 | COUMO-2018 0201 | | 17:10 | Water | 7 | X | X | X | X | X | X | X | X | X | | | | |
| 4 | EVAMS-2018 0201 | | 18:00 | Water | 7 | X | X | X | X | X | X | X | X | X | | | | |
| 5 | EVALSS-2018 0201 | | 18:20 | Water | 7 | X | X | X | X | X | X | X | X | X | | | | |
| 6 | MONMN-2018 0201 | | 18:55 | Water | 7 | X | X | X | X | X | X | X | X | X | | | | |
| 7 | MONMS-2018 0201 | | 19:15 | Water | 7 | X | X | X | X | X | X | X | X | X | | | | |
| 8 | MONM-2018 0201 | | 20:25 | Water | 7 | X | X | X | X | X | X | X | X | X | | | | |
| 9 | SEIMN-2018 0201 | | 19:05 | Water | 7 | X | X | X | X | X | X | X | X | X | | | | |
| 10 | SEIMS-2018 0201 | | 20:00 | Water | 7 | X | X | X | X | X | X | X | X | X | | | | |
| 11 | TOSMI-2018 0201 | | 17:10 | Water | 7 | X | X | X | X | X | X | X | X | X | | | | |
| 12 | TOSMO-2018 0201 | | 17:50 | Water | 7 | X | X | X | X | X | X | X | X | X | | | | |
| 13 | TYLMI-2018 0201 | | 18:35 | Water | 7 | X | X | X | X | X | X | X | X | X | | | | |
| 14 | TYLMO-2018 0201 | | 18:20 | Water | 7 | X | X | X | X | X | X | X | X | X | | | | |
| 15 | QA 44-2018 0201 | | 19:20 | Water | 7 | X | X | X | X | X | X | X | X | X | | | | |

Relinquished by Valeri M Date 2/2/18 Received by Diana J. Galati Date 2-2-18
 Firm Herrera Time 10:00 Firm ALPHA Time 9:55 AM
 Relinquished by _____ Date _____ Received by _____ Date _____
 Firm _____ Time _____ Firm _____ Time _____

Comments:
 * - field filtered with 0.45 µm filter within 15 minutes of collecting sample

METER CALIBRATION LOG - Redmond Paired Watershed Study

| | | | |
|-----------------------------------|------------------------------|-------|-------|
| Project Number: | 14-05806-000 | | |
| Personnel Performing Calibration: | M. Mullen | | |
| Meter: | Pro DSS 1 | | |
| Date/Time: | 2.1.18 14:30 | | |
| Barometric Pressure Start of Day: | mmHg: 762.2 | Time: | 14:30 |
| Barometric Pressure End of Day: | mmHg: 762.2 741.5 | Time: | 21:20 |

Calibration Procedures:

Rinse Multimeter Sonde Between Each Operation

Rinse 3 times with tap water, 3 times with deionized water, then 3 times with the solution to be used for calibrating or testing.

Conductivity Calibration Notes:

1. Dry the conductivity probe with a lab tissue (e.g., KimWipes®) and DI water.
2. Fill calibration cup to within a centimeter of the top of the calibration cup with DI water (0 µS).
3. Fill the calibration cup with 1,000 µS standard so that the temperature/conductivity probe is submerged.
4. Make sure there are no bubbles in the cell; wait 2 minutes.
5. Enter the appropriate standard value (1,000 µS/cm or 1.0 mS/cm) for Sp Cond.
6. Check conductivity using 100 µS/cm standard.

Dissolved Oxygen Calibration Notes:

1. Fill the calibration cup with about 1/2 inch of DI; it should be below the sensor cap.
2. Use KimWipes® to dry any droplets from the sensor cap.
3. Invert calibration cup's cap and gently rest it on the cup.
4. Wait 5 minutes, making sure that temperature stabilizes.
5. Determine local barometric pressure (mm Hg) and enter this value into the meter.
6. Click "Calibrate". "Calibrate Successful" will be displayed.
7. To retain calibration accuracy between measurements, store with the sensor immersed in water or within a water-saturated air environment such as a sealed storage cup with at least 10 ml of water.
8. It is important to have the water-saturated air and the sensor at the same temperature. Therefore, store a jar of DI in the same environment as the sonde and calibrate in a similar air temperature as the water and sonde.
9. Keep probe out of direct sun or wind.



| PRE Field Run CALIBRATION | Meter Reading | Buffer / Cal Std | Temp °C | Comments |
|---------------------------|---------------|------------------|---------|------------------|
| Conductivity (µS/cm) | 8.8 | 0 | 23.1 | HERRERA DI water |
| Conductivity (µS/cm) | 100.0 | 1,000 | 23.0 | |
| Conductivity (µS/cm) | 100.5 | 100 | 22.6 | |
| DO % Saturation | 100.0 | 100 | 23.7 | |
| POST Field Run CHECK | Meter Reading | Buffer / Cal Std | Temp °C | Comments |
| Conductivity (µS/cm) | 7.9 | 0 | 22.7 | HERRERA DI water |
| Conductivity (µS/cm) | 100.3 | 100 | 22.5 | |
| DO % Saturation | 100.0 | 100 | 22.1 | |

METER CALIBRATION LOG - Redmond Paired Watershed Study

| | | | |
|-----------------------------------|--------------|-------|-------|
| Project Number: | 14-05806-000 | | |
| Personnel Performing Calibration: | M Muller | | |
| Meter: | Pro DSS 2 | | |
| Date/Time: | 2.1.18 14:30 | | |
| Barometric Pressure Start of Day: | mmHg: 762.8 | Time: | 14:30 |
| Barometric Pressure End of Day: | mmHg: 760.9 | Time: | 21:20 |

| |
|---|
| Calibration Procedures: |
| Rinse Multimeter Sonde Between Each Operation |
| Rinse 3 times with tap water, 3 times with deionized water, then 3 times with the solution to be used for calibrating or testing. |



Conductivity Calibration Notes:

1. Dry the conductivity probe with a lab tissue (e.g., KimWipes®) and DI water.
2. Fill calibration cup to within a centimeter of the top of the calibration cup with DI water (0 µS).
3. Fill the calibration cup with 1,000 µS standard so that the temperature/conductivity probe is submerged.
4. Make sure there are no bubbles in the cell; wait 2 minutes.
5. Enter the appropriate standard value (1,000 µS/cm or 1.0 mS/cm) for Sp Cond.
6. Check conductivity using 100 µS/cm standard.

Dissolved Oxygen Calibration Notes:

1. Fill the calibration cup with about 1/2 inch of DI; it should be below the sensor cap.
2. Use KimWipes® to dry any droplets from the sensor cap.
3. Invert calibration cup's cap and gently rest it on the cup.
4. Wait 5 minutes, making sure that temperature stabilizes.
5. Determine local barometric pressure (mm Hg) and enter this value into the meter.
6. Click "Calibrate". "Calibrate Successful" will be displayed.
7. To retain calibration accuracy between measurements, store with the sensor immersed in water or within a water-saturated air environment such as a sealed storage cup with at least 10 ml of water.
8. It is important to have the water-saturated air and the sensor at the same temperature. Therefore, store a jar of DI in the same environment as the sonde and calibrate in a similar air temperature as the water and sonde.
9. Keep probe out of direct sun or wind.

| PRE Field Run CALIBRATION | Meter Reading | Buffer / Cal Std | Temp °C | Comments |
|---------------------------|---------------|------------------|---------|------------------|
| Conductivity (µS/cm) | 8.4 | 0 | 23.4 | Herrera DI water |
| Conductivity (µS/cm) | 100.2 | 1,000 | 23.1 | |
| Conductivity (µS/cm) | 100.5 | 100 | 23.2 | |
| DO % Saturation | 100.2 | 100 | 29.9 | |

| POST Field Run CHECK | Meter Reading | Buffer / Cal Std | Temp °C | Comments |
|----------------------|---------------|------------------|---------|------------------|
| Conductivity (µS/cm) | 8.4 | 0 | 22.9 | Herrera DI water |
| Conductivity (µS/cm) | 100.1 | 100 | 23.1 | |
| DO % Saturation | 99.8 | 100 | 22.4 | |

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: M Mulken J Geigel
 Sample Date: 2-1-18 Sample Time: 19:50 PDT:
 Base Flow or Storm Event? Field Filtered Time: 19:55 PST:
(Must filter within 15 minutes of collection)

SITE ID: COLM
 Project Number: 14-05806-000



Project Name: Redmond Paired Watershed Study

Current Weather and Temp: rainy 39°

Water Quality Sampling

Sample ID: COLM-20180201

| Parameter | Bottle Type | Bottle Volume | # Bottles | Preservative | Duplicated? |
|---------------------------|-------------|---------------|-----------|--------------------------------|-------------|
| TSS and Turbidity | HDPE | 1L | 1 | NA | <u>No</u> |
| DOC * | HDPE | 250 ml | 1 | HCL | ↓ |
| Fecal Col. Bact. | HDPE | 250 ml | 1 | EDTA | |
| T. Phosphorous | HDPE | 250 ml | 1 | H ₂ SO ₄ | |
| T. Nitrogen | HDPE | 250 ml | 1 | H ₂ SO ₄ | |
| Diss. Cu and Zn * | HDPE | 250 ml | 1 | HNO ₃ | |
| Hardness, Total Cu and Zn | HDPE | 500 ml | 1 | HNO ₃ | |

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID: _____
 Filter blank sample ID: _____
 Transfer blank sample ID: _____

Visual and Olfactory Conditions:

Clarity: clear
 Color: none
 Odor: none
 Sheen: none
 Floatables: some foam

LABORATORY DELIVERY

Date: _____ Time: _____

Quality Assurance

Checked By: J Geigel Signature: [Signature]
 Date Checked: 3-22-18 Time: _____
 Data Entered into Database? YES NO initials: _____
 Date Entered: _____ Time: _____
 Notes: _____

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

YSI Pro Plus (15D100020) _____
 YSI Pro DSS 1 _____
 YSI Pro DSS 2

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): 5.95
 Reference Point (description): SG

Water Quality Measurements

Temperature (°C) 5.8
 Specific Conductivity (µs/cm) 25.8
 Dissolved Oxygen (mg/L) 11.54

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: JM + VW

Sample Date: 2/1/18

Sample Time: 17:25

PDT:

SITE ID: COUM1

Base Flow or Storm Event? (circled)

Field Filtered Time: 17:25

PST: X

Project Number: 14-05806-000



Project Name: Redmond Paired Watershed Study

Current Weather and Temp: 43°F + Rain

Water Quality Sampling

Sample ID: COUM120180201

| Parameter | Bottle Type | Bottle Volume | # Bottles | Preservative | Duplicated? |
|---------------------------|-------------|---------------|-----------|--------------------------------|-------------|
| TSS and Turbidity | HDPE | 1L | 1 | NA | <u>NO</u> |
| DOC * | HDPE | 250 ml | 1 | HCL | } ↓ |
| Fecal Col. Bact. | HDPE | 250 ml | 1 | EDTA | |
| T. Phosphorous | HDPE | 250 ml | 1 | H ₂ SO ₄ | |
| T. Nitrogen | HDPE | 250 ml | 1 | H ₂ SO ₄ | |
| Diss. Cu and Zn * | HDPE | 250 ml | 1 | HNO ₃ | |
| Hardness, Total Cu and Zn | HDPE | 500 ml | 1 | HNO ₃ | ↓ |

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID: _____

Filter blank sample ID: _____

Transfer blank sample ID: _____

Visual and Olfactory Conditions:

Clarity: clear

Color: none

Odor: none

Sheen: none

Floatables: none

LABORATORY DELIVERY

Date: _____ Time: _____

Quality Assurance

Checked By: Z. Kenth Signature: [Signature]

Date Checked: 2-22-18 Time: _____

Data Entered into Database? YES NO initials: _____

Date Entered: _____ Time: _____

Notes: _____

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

YSI Pro Plus (15D100020) _____

YSI Pro DSS 1 X _____

YSI Pro DSS 2 _____

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): 2.81

Reference Point (description): stream gage

Water Quality Measurements

Temperature (°C) 7.4

Specific Conductivity (µs/cm) 59.1

Dissolved Oxygen (mg/L) 11.87

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: JM + VW

Sample Date: 2/1/18

Sample Time: 17:10

PDT:

SITE ID: COUMO

Base Flow or Storm Event?

Field Filtered Time: 17:10

PST: X

Project Number: 14-05806-000

(Must filter within 15 minutes of collection)



HERRERA

Project Name: Redmond Paired Watershed Study

Current Weather and Temp: 43°F + Rain

Water Quality Sampling

Sample ID: COUMO20180201

| Parameter | Bottle Type | Bottle Volume | # Bottles | Preservative | Duplicated? |
|---------------------------|-------------|---------------|-----------|--------------------------------|-------------|
| TSS and Turbidity | HDPE | 1L | 1 | NA | <u>No</u> |
| DOC * | HDPE | 250 ml | 1 | HCL | ↓ |
| Fecal Col. Bact. | HDPE | 250 ml | 1 | EDTA | |
| T. Phosphorous | HDPE | 250 ml | 1 | H ₂ SO ₄ | |
| T. Nitrogen | HDPE | 250 ml | 1 | H ₂ SO ₄ | |
| Diss. Cu and Zn * | HDPE | 250 ml | 1 | HNO ₃ | |
| Hardness, Total Cu and Zn | HDPE | 500 ml | 1 | HNO ₃ | <u>↓</u> |

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID:

Filter blank sample ID:

Transfer blank sample ID:

Visual and Olfactory Conditions:

Clarity: clear
 Color: none
 Odor: none
 Sheen: none
 Floatables: none

LABORATORY DELIVERY

Date:

Time:

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

YSI Pro Plus (15D100020) _____

YSI Pro DSS 1 X _____

YSI Pro DSS 2 _____

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): 1.44

Reference Point (description): stream gage

Water Quality Measurements

Temperature (°C) 7.8

Specific Conductivity (µs/cm) 127.9

Dissolved Oxygen (mg/L) 11.38

Quality Assurance

Checked By: Z. Lenth

Signature: [Signature]

Date Checked: 3-22-18

Time:

Data Entered into Database?

YES

NO

initials:

Date Entered:

Time:

Notes:

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: M. Miller & Gregel
 Sample Date: 2-1-18 Sample Time: 10:00 PDT:
 Base Flow or Stormy Event? Field Filtered Time: 16:05 PST:
(Must filter within 15 minutes of collection)

SITE ID: EVAMS
 Project Number: 14-05806-000



Water Quality Sampling

Sample ID: EVAMS-20180201

| Parameter | Bottle Type | Bottle Volume | # Bottles | Preservative | Duplicated? |
|---------------------------|-------------|---------------|-----------|--------------------------------|-------------|
| TSS and Turbidity | HDPE | 1L | 1 | NA | <u>NO</u> |
| DOC * | HDPE | 250 ml | 1 | HCL | ↓ |
| Fecal Col. Bact. | HDPE | 250 ml | 1 | EDTA | |
| T. Phosphorous | HDPE | 250 ml | 1 | H ₂ SO ₄ | |
| T. Nitrogen | HDPE | 250 ml | 1 | H ₂ SO ₄ | |
| Diss. Cu and Zn * | HDPE | 250 ml | 1 | HNO ₃ | |
| Hardness, Total Cu and Zn | HDPE | 500 ml | 1 | HNO ₃ | |

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID: _____
 Filter blank sample ID: _____
 Transfer blank sample ID: _____

Visual and Olfactory Conditions:

Clarity: clear
 Color: none
 Odor: none
 Sheen: none
 Floatables: some foam

LABORATORY DELIVERY

Date: _____ Time: _____

Quality Assurance

Checked By: Z. Lenth Signature: [Signature]
 Date Checked: 3-22-18 Time: _____
 Data Entered into Database? YES NO initials:
 Date Entered: _____ Time: _____
 Notes: _____

Project Name: Redmond Paired Watershed Study

Current Weather and Temp: rainy 40°

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

YSI Pro Plus (15D100020) _____
 YSI Pro DSS 1 _____
 YSI Pro DSS 2

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): 3.90
 Reference Point (description): SG

Water Quality Measurements

Temperature (°C) 7.5
 Specific Conductivity (µs/cm) 154.1
 Dissolved Oxygen (mg/L) 11.68

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: M. Muller J. Grigel
 Sample Date: 2-1-18 Sample Time: 18:20 PDT: _____
 Base Flow or Storm Event? Field Filtered Time: 18:25 PST:
 (Must filter within 15 minutes of collection)

SITE ID: EVALLS
 Project Number: 14-05806-000



Project Name: Redmond Paired Watershed Study

Current Weather and Temp: raining 39°

Water Quality Sampling

Sample ID: EVALLS-20180201

| Parameter | Bottle Type | Bottle Volume | # Bottles | Preservative | Duplicated? |
|---------------------------|-------------|---------------|-----------|--------------------------------|-------------|
| TSS and Turbidity | HDPE | 1L | 1 | NA | <u>NO</u> |
| DOC * | HDPE | 250 ml | 1 | HCL | ↓ ✓ |
| Fecal Col. Bact. | HDPE | 250 ml | 1 | EDTA | |
| T. Phosphorous | HDPE | 250 ml | 1 | H ₂ SO ₄ | |
| T. Nitrogen | HDPE | 250 ml | 1 | H ₂ SO ₄ | |
| Diss. Cu and Zn * | HDPE | 250 ml | 1 | HNO ₃ | |
| Hardness, Total Cu and Zn | HDPE | 500 ml | 1 | HNO ₃ | |

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID: _____
 Filter blank sample ID: _____
 Transfer blank sample ID: _____

Visual and Olfactory Conditions:

Clarity: clear
 Color: none
 Odor: none
 Sheen: none
 Floatables: none

LABORATORY DELIVERY

Date: _____ Time: _____

Quality Assurance

Checked By: Z. Lenth Signature: [Signature]
 Date Checked: 3-22-18 Time: _____
 Data Entered into Database? YES / NO initials: _____
 Date Entered: _____ Time: _____
 Notes: _____

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

YSI Pro Plus (15D100020) _____
 YSI Pro DSS 1 _____
 YSI Pro DSS 2 _____

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): 2.40
 Reference Point (description): SG

Water Quality Measurements

Temperature (°C) 7.6
 Specific Conductivity (µs/cm) 144.2
 Dissolved Oxygen (mg/L) 11.97

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: JM, UW

Sample Date: 2/1/18

Sample Time: 10:55

PDT:

SITE ID: MONMN

Base Flow or Storm Event? Storm Event

Field Filtered Time: 10:55

PST: X

Project Number: 14-05806-000

(Must filter within 15 minutes of collection)



Project Name: Redmond Paired Watershed Study

Current Weather and Temp: 43°F, rain

Water Quality Sampling

Sample ID: MONMN20180201

| Parameter | Bottle Type | Bottle Volume | # Bottles | Preservative | Duplicated? |
|---------------------------|-------------|---------------|-----------|--------------------------------|-------------|
| TSS and Turbidity | HDPE | 1L | 1 | NA | NO |
| DOC * | HDPE | 250 ml | 1 | HCL | ↓ |
| Fecal Col. Bact. | HDPE | 250 ml | 1 | EDTA | |
| T. Phosphorous | HDPE | 250 ml | 1 | H ₂ SO ₄ | |
| T. Nitrogen | HDPE | 250 ml | 1 | H ₂ SO ₄ | |
| Diss. Cu and Zn * | HDPE | 250 ml | 1 | HNO ₃ | |
| Hardness, Total Cu and Zn | HDPE | 500 ml | 1 | HNO ₃ | ↓ |

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID:

Filter blank sample ID:

Transfer blank sample ID:

Visual and Olfactory Conditions:

Clarity: clear
 Color: none
 Odor: none
 Sheen: none
 Floatables: bubbles below stone weir

LABORATORY DELIVERY

Date:

Time:

Quality Assurance

Checked By: S. Lenth

Signature: [Signature]

Date Checked: 3-22-18

Time:

Data Entered into Database?

YES

NO

initials:

Date Entered:

Time:

Notes:

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

YSI Pro Plus (15D100020)

YSI Pro DSS 1 X

YSI Pro DSS 2

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): 6.33 (?) 9.33

Reference Point (description): stream gage

Water Quality Measurements

Temperature (°C) 7.1

Specific Conductivity (µs/cm) 105.0

Dissolved Oxygen (mg/L) 11.72

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: JM, VW

Sample Date: 2/1/18

Sample Time: 19:15/19:20

PDT:

SITE ID: MONMS

Base Flow or Storm Event?

Field Filtered Time: 19:15/19:20

PST: X

Project Number: 14-05806-000

(Must filter within 15 minutes of collection)



HERRERA

Project Name: Redmond Paired Watershed Study

Current Weather and Temp: 43°F, rain

Water Quality Sampling

Sample ID: MONMS 20180201

| Parameter | Bottle Type | Bottle Volume | # Bottles | Preservative | Duplicated? |
|---------------------------|-------------|---------------|-----------|--------------------------------|-------------|
| TSS and Turbidity | HDPE | 1L | 1 | NA | <u>YES</u> |
| DOC * | HDPE | 250 ml | 1 | HCL | ↓ |
| Fecal Col. Bact. | HDPE | 250 ml | 1 | EDTA | |
| T. Phosphorous | HDPE | 250 ml | 1 | H ₂ SO ₄ | |
| T. Nitrogen | HDPE | 250 ml | 1 | H ₂ SO ₄ | |
| Diss. Cu and Zn * | HDPE | 250 ml | 1 | HNO ₃ | |
| Hardness, Total Cu and Zn | HDPE | 500 ml | 1 | HNO ₃ | ↓ |

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID: QA4420180201

Filter blank sample ID:

Transfer blank sample ID:

Visual and Olfactory Conditions:

Clarity: clear
 Color: none
 Odor: none
 Sheen: none
 Floatables: none

LABORATORY DELIVERY

Date:

Time:

Quality Assurance

Checked By: J. Lenth

Signature: [Signature]

Date Checked: 3-22-18

Time:

Data Entered into Database?

YES

NO

initials:

Date Entered:

Time:

Notes:

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

YSI Pro Plus (15D100020) _____

YSI Pro DSS 1 X

YSI Pro DSS 2 _____

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): 69.48

Reference Point (description): drop line

Water Quality Measurements

Temperature (°C) 7.2

Specific Conductivity (µs/cm) 165.6

Dissolved Oxygen (mg/L) 10.61

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: JM + VW

Sample Date: 2/1/18

Sample Time: 20:25

PDT:

SITE ID: MONM

Base Flow or Storm Event?

Field Filtered Time: 20:25

PST: X

Project Number: 14-05806-000

(Must filter within 15 minutes of collection)



HERRERA

Project Name: Redmond Paired Watershed Study

Current Weather and Temp: 43°F light Rain

Water Quality Sampling

Sample ID: MONM10180201

| Parameter | Bottle Type | Bottle Volume | # Bottles | Preservative | Duplicated? |
|---------------------------|-------------|---------------|-----------|--------------------------------|-------------|
| TSS and Turbidity | HDPE | 1L | 1 | NA | <u>NO</u> |
| DOC * | HDPE | 250 ml | 1 | HCL | ↓ |
| Fecal Col. Bact. | HDPE | 250 ml | 1 | EDTA | |
| T. Phosphorous | HDPE | 250 ml | 1 | H ₂ SO ₄ | |
| T. Nitrogen | HDPE | 250 ml | 1 | H ₂ SO ₄ | |
| Diss. Cu and Zn * | HDPE | 250 ml | 1 | HNO ₃ | |
| Hardness, Total Cu and Zn | HDPE | 500 ml | 1 | HNO ₃ | <u>Y</u> |

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID: _____
 Filter blank sample ID: _____
 Transfer blank sample ID: _____

Visual and Olfactory Conditions:

Clarity: clear
 Color: brown
 Odor: none
 Sheen: none
 Floatables: none

LABORATORY DELIVERY

Date: _____ Time: _____

Quality Assurance

Checked By: Z. Lenth Signature: [Signature]

Date Checked: 3-22-18 Time: _____

Data Entered into Database? YES NO initials: _____

Date Entered: _____ Time: _____

Notes: _____

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

YSI Pro Plus (15D100020) _____
 YSI Pro DSS 1 X _____
 YSI Pro DSS 2 _____

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): N/A
 Reference Point (description): N/A

Water Quality Measurements

Temperature (°C) 7.2
 Specific Conductivity (µs/cm) 126.8
 Dissolved Oxygen (mg/L) 12.03

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: M Muller J Geigel
 Sample Date: 3-1-18 Sample Time: 8:05 PDT:
 Base Flow or Storm Event? Field Filtered Time: 19:10 PST:

SITE ID: SEIMN
 Project Number: 14-05806-000



Water Quality Sampling

Sample ID: SEIMN-20180201

| Parameter | Bottle Type | Bottle Volume | # Bottles | Preservative | Duplicated? |
|---------------------------|-------------|---------------|-----------|--------------------------------|-------------|
| TSS and Turbidity | HDPE | 1L | 1 | NA | NO |
| DOC * | HDPE | 250 ml | 1 | HCL | ↓ |
| Fecal Col. Bact. | HDPE | 250 ml | 1 | EDTA | |
| T. Phosphorous | HDPE | 250 ml | 1 | H ₂ SO ₄ | |
| T. Nitrogen | HDPE | 250 ml | 1 | H ₂ SO ₄ | |
| Diss. Cu and Zn * | HDPE | 250 ml | 1 | HNO ₃ | |
| Hardness, Total Cu and Zn | HDPE | 500 ml | 1 | HNO ₃ | |

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID: _____
 Filter blank sample ID: _____
 Transfer blank sample ID: _____

Visual and Olfactory Conditions:

Clarity: clear
 Color: none
 Odor: none
 Sheen: none
 Floatables: very little foam

LABORATORY DELIVERY

Date: _____ Time: _____

Quality Assurance

Checked By: J. Geigel Signature: [Signature]
 Date Checked: 3-22-18 Time: _____
 Data Entered into Database? YES NO initials:
 Date Entered: _____ Time: _____
 Notes: _____

Project Name: Redmond Paired Watershed Study

Current Weather and Temp: rainy 39°

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

YSI Pro Plus (15D100020) _____
 YSI Pro DSS 1 _____
 YSI Pro DSS 2

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): 0.60

Reference Point (description): top of bolt bolts

Water Quality Measurements

Temperature (°C) 6.7
 Specific Conductivity (µs/cm) 45.1
 Dissolved Oxygen (mg/L) 12.09

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: JM, UW

Sample Date: 2/1/18

Sample Time: 20:06

PDT:

SITE ID: SEIMS

Base Flow or Storm Event? Storm Event?

Field Filtered Time: 20:00

PST: X

Project Number: 14-05806-000

(Must filter within 15 minutes of collection)



HERRERA

Project Name: Redmond Paired Watershed Study

Current Weather and Temp: 43°F, rain

Water Quality Sampling

Sample ID: SEIMS20180201

| Parameter | Bottle Type | Bottle Volume | # Bottles | Preservative | Duplicated? |
|---------------------------|-------------|---------------|-----------|--------------------------------|-------------|
| TSS and Turbidity | HDPE | 1L | 1 | NA | <u>NO</u> |
| DOC * | HDPE | 250 ml | 1 | HCL | ↓ |
| Fecal Col. Bact. | HDPE | 250 ml | 1 | EDTA | |
| T. Phosphorous | HDPE | 250 ml | 1 | H ₂ SO ₄ | |
| T. Nitrogen | HDPE | 250 ml | 1 | H ₂ SO ₄ | |
| Diss. Cu and Zn * | HDPE | 250 ml | 1 | HNO ₃ | |
| Hardness, Total Cu and Zn | HDPE | 500 ml | 1 | HNO ₃ | ↓ |

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID:

Filter blank sample ID:

Transfer blank sample ID:

Visual and Olfactory Conditions:

Clarity: clear
 Color: none
 Odor: none
 Sheen: none
 Floatables: none

LABORATORY DELIVERY

Date:

Time:

Quality Assurance

Checked By: S. Lenth

Signature: [Signature]

Date Checked: 3-22-18

Time:

Data Entered into Database?

YES

NO

initials:

Date Entered:

Time:

Notes:

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

YSI Pro Plus (15D100020)

YSI Pro DSS 1 X

YSI Pro DSS 2

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): 0.95

Reference Point (description): Stream gage

Water Quality Measurements

Temperature (°C) 6.6

Specific Conductivity (µs/cm) 69.1

Dissolved Oxygen (mg/L) 11.51

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: M Mullen, J Griesel
 Sample Date: 2-1-18 Sample Time: 15:35 17:10 PDT:
 Base Flow or Storm Event? Field Filtered Time: 15:40 17:15 PST:
 (Must filter within 15 minutes of collection)

SITE ID: TOSMI
 Project Number: 14-05806-000



Project Name: Redmond Paired Watershed Study

Current Weather and Temp: rainy 41°

Water Quality Sampling

Sample ID: TOSMI-20180201

| Parameter | Bottle Type | Bottle Volume | # Bottles | Preservative | Duplicated? |
|---------------------------|-------------|---------------|-----------|--------------------------------|-------------|
| TSS and Turbidity | HDPE | 1L | 1 | NA | No |
| DOC * | HDPE | 250 ml | 1 | HCL | |
| Fecal Col. Bact. | HDPE | 250 ml | 1 | EDTA | |
| T. Phosphorous | HDPE | 250 ml | 1 | H ₂ SO ₄ | |
| T. Nitrogen | HDPE | 250 ml | 1 | H ₂ SO ₄ | |
| Diss. Cu and Zn * | HDPE | 250 ml | 1 | HNO ₃ | |
| Hardness, Total Cu and Zn | HDPE | 500 ml | 1 | HNO ₃ | |

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID: _____
 Filter blank sample ID: _____
 Transfer blank sample ID: _____

Visual and Olfactory Conditions:

Clarity: cloudy
 Color: none
 Odor: none
 Sheen: none
 Floatables: none

LABORATORY DELIVERY

Date: _____ Time: _____

Quality Assurance

Checked By: S. Lenth Signature: [Signature]
 Date Checked: 3-22-18 Time: _____
 Data Entered into Database? YES NO initials:
 Date Entered: _____ Time: _____
 Notes: _____

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

YSI Pro Plus (15D100020) _____
 YSI Pro DSS 1 _____
 YSI Pro DSS 2 _____

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): 1.00
 Reference Point (description): SL

Water Quality Measurements

Temperature (°C) 8.4
 Specific Conductivity (µs/cm) 68.2
 Dissolved Oxygen (mg/L) 11.64

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: JM + VW

Sample Date: 2/1/18

Sample Time: 17:50

PDT:

SITE ID: TOSMO

Base Flow or Storm Event? (circled)

Field Filtered Time: 17:50

PST: X

Project Number: 14-05806-000



HERRERA

Project Name: Redmond Paired Watershed Study

Current Weather and Temp: 43°F + Rain

Water Quality Sampling

Sample ID: TOSMO20180201

| Parameter | Bottle Type | Bottle Volume | # Bottles | Preservative | Duplicated? |
|---------------------------|-------------|---------------|-----------|--------------------------------|-------------|
| TSS and Turbidity | HDPE | 1L | 1 | NA | <u>NO</u> |
| DOC * | HDPE | 250 ml | 1 | HCL | ↓ |
| Fecal Col. Bact. | HDPE | 250 ml | 1 | EDTA | |
| T. Phosphorous | HDPE | 250 ml | 1 | H ₂ SO ₄ | |
| T. Nitrogen | HDPE | 250 ml | 1 | H ₂ SO ₄ | |
| Diss. Cu and Zn * | HDPE | 250 ml | 1 | HNO ₃ | |
| Hardness, Total Cu and Zn | HDPE | 500 ml | 1 | HNO ₃ | |

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID:

Filter blank sample ID:

Transfer blank sample ID:

Visual and Olfactory Conditions:

Clarity: clear
 Color: brown
 Odor: None
 Sheen: None
 Floatables: bubbles below weir

LABORATORY DELIVERY.

Date: _____ Time: _____

Quality Assurance

Checked By: J. Lenth

Signature: [Signature]

Date Checked: 5-22-19 Time: _____

Data Entered into Database? YES NO Initials: _____

Date Entered: _____ Time: _____

Notes:

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

YSI Pro Plus (15D100020) _____

YSI Pro DSS 1 X _____

YSI Pro DSS 2 _____

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): 0.61

Reference Point (description): Stream gage

Water Quality Measurements

Temperature (°C) 8.0

Specific Conductivity (µs/cm) 122.9

Dissolved Oxygen (mg/L) 11.73

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: JM, UW

Sample Date: 2/1/18

Sample Time: 18:35

PDT:

SITE

ID: TYLM12

Base Flow or Storm Event? Storm Event

Field Filtered Time: 18:35

PST: X

Project Number: 14-05806-000

(Must filter within 15 minutes of collection)



HERRERA

Project Name: Redmond Paired Watershed Study

Current Weather and Temp: 43° F, rain

Water Quality Sampling

Sample ID: TYLM120180201

| Parameter | Bottle Type | Bottle Volume | # Bottles | Preservative | Duplicated? |
|---------------------------|-------------|---------------|-----------|--------------------------------|-------------|
| TSS and Turbidity | HDPE | 1L | 1 | NA | <u>NO</u> |
| DOC * | HDPE | 250 ml | 1 | HCL | ↓ |
| Fecal Col. Bact. | HDPE | 250 ml | 1 | EDTA | |
| T. Phosphorous | HDPE | 250 ml | 1 | H ₂ SO ₄ | |
| T Nitrogen | HDPE | 250 ml | 1 | H ₂ SO ₄ | |
| Diss. Cu and Zn * | HDPE | 250 ml | 1 | HNO ₃ | |
| Hardness, Total Cu and Zn | HDPE | 500 ml | 1 | HNO ₃ | ↓ |

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID:

Filter blank sample ID:

Transfer blank sample ID:

Visual and Olfactory Conditions:

Clarity: clear
 Color: none
 Odor: none
 Sheen: none
 Floatables: bubbles below stone weir

LABORATORY DELIVERY

Date:

Time:

Quality Assurance

Checked By: J. Conk

Signature: [Signature]

Date Checked: 3-22-18

Time:

Data Entered into Database?

YES NO

initials:

Date Entered:

Time:

Notes:

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

YSI Pro Plus (15D100020) _____

YSI Pro DSS 1 X

YSI Pro DSS 2 _____

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): 4.39

Reference Point (description): top of culvert

Water Quality Measurements

Temperature (°C) 7.3

Specific Conductivity (µs/cm) 106.3

Dissolved Oxygen (mg/L) 11.49

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

 Field Personnel: JM, VW

 Sample Date: 2/1/18

 Sample Time: 18:20

PDT:

 Base Flow or Storm Event? Storm

 Field Filtered Time: 18:20

 PST:

(Must filter within 15 minutes of collection)

 SITE ID: TYLMO

 Project Number: 14-05806-000

HERRERA

 Project Name: Redmond Paired Watershed Study

 Current Weather and Temp: 45°F, rain

Water Quality Sampling

 Sample ID: TYLMO20180201

| Parameter | Bottle Type | Bottle Volume | # Bottles | Preservative | Duplicated? |
|---------------------------|-------------|---------------|-----------|--------------------------------|-------------|
| TSS and Turbidity | HDPE | 1L | 1 | NA | <u>NO</u> |
| DOC * | HDPE | 250 ml | 1 | HCL | ↓ |
| Fecal Col. Bact. | HDPE | 250 ml | 1 | EDTA | |
| T. Phosphorous | HDPE | 250 ml | 1 | H ₂ SO ₄ | |
| T. Nitrogen | HDPE | 250 ml | 1 | H ₂ SO ₄ | |
| Diss. Cu and Zn * | HDPE | 250 ml | 1 | HNO ₃ | |
| Hardness, Total Cu and Zn | HDPE | 500 ml | 1 | HNO ₃ | |

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID:

Filter blank sample ID:

Transfer blank sample ID:

Visual and Olfactory Conditions:

 Clarity: clear
 Color: brown
 Odor: none
 Sheen: none
 Floatables: none

LABORATORY DELIVERY

Date: _____ Time: _____

Quality Assurance

 Checked By: J. Leuth

Signature:

 Date Checked: 3-22-18 Time: _____

Data Entered into Database? YES NO initials:

Date Entered: _____ Time: _____

Notes:

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

YSI Pro Plus (15D100020) _____

 YSI Pro DSS 1

YSI Pro DSS 2 _____

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

 Stream Stage (ft): 2.61

 Reference Point (description): top of culvert

Water Quality Measurements

 Temperature (°C) 7.2

 Specific Conductivity (µs/cm) 50.7

 Dissolved Oxygen (mg/L) 11.88



HERRERA

Data Quality Assurance Worksheet

Project Name/No./Client: Redmond Paired Watershed Study / 14-05806-000 / City of Redmond

Laboratory/Parameters: OnSite Environmental : TSS, turbidity, hardness, DOC, TP, Dissolved & Total Cu, Zn / AmTest: Total nitrogen, fecal coliform bacteria

Sample Date/Sample ID: 2/01/2018 / All sites, 1 FD (QA44) at MONMS

By G. Catarra

Date 3/12/18 Page 1 of 2

Checked: initials JL

date 3/22/18

| Parameter | Completeness/ Methodology | Pre-preservation Holding Times (minutes) | | Total Holding Times (days) | | Method Blanks Reporting Limit | Matrix Spikes/ Surrogate Recovery (%) | | Lab Control Samples Recovery (%) | | Lab Duplicates RPD (%) | | Field Duplicates RPD (%) | | Instrument Calibration/ Performance | ACTION |
|-------------------------------------|------------------------------|--|------|-------------------------------|------|--|---|-------------------|--|-------------------|---------------------------|-------------------|-----------------------------|-------------------|---|--|
| | | Reported | Goal | Reported | Goal | | Reported | Goal ¹ | Reported | Goal ¹ | Reported | Goal ¹ | Reported | Goal ¹ | | |
| TSS | OK / SM 2540D | NA | NA | 7 | ≤7 | ≤1.0 mg/L 1.0 mg/L | NA | NA | 107 | ±20 | 5 | ≤25 | 22 | ≤25 | OK | NONE |
| Turbidity | OK / EPA 180.1 | NA | NA | 1 | ≤2 | ≤0.1 NTU 0.1 NTU | NA | NA | NA | ±10 | 0 | ≤25 | 21 | ≤25 | OK | NONE |
| Hardness | OK / SM 2340B | NA | NA | 12 | ≤180 | ≤1.0 mg/L 1.0 mg/L | 102,98 | ±25 | 99 | ±15 | 2 | ≤20 | 3.2 | ≤20 | OK | NONE |
| DOC | OK / SM 5310B | <15 | ≤15 | 4 | ≤28 | ≤1.0 mg/L 1.0 mg/L | 93 | ±25 | 100 | ±15 | 0 | ≤20 | 1.9 | ≤20 | OK | NONE |
| Total Phosphorus | OK / EPA 365.1 | NA | NA | 5 | ≤28 | ≤0.01 mg/L 0.01 mg/L | 97 | ±25 | 89 | ±20 | NC | ≤20 | D=0.005 | ≤20 | OK | NONE |
| Total Nitrogen (TKN + N+N) | OK/ SM 4500 N-B | NA | NA | 1-14 | ≤28 | ≤0.1 mg/L 0.1 mg/L | 104, 1015 | ±25 | 98-101 | ±20 | 0-13 | ≤20 | D=0.068 D=0.349 | ≤20 | OK | FLAG N+N "J" FOR MONMS DUE TO FD EXCEEDANCE. |

¹ If the sample or duplicate value is less than five times the reporting limit, the difference is calculated rather than the relative percent difference (RPD). The QA goal is a difference <2 times the detection limit instead of the number indicated in the goal column.

NA – not applicable or not available; NC – not calculable due to one or more values below the detection limit; NS – field duplicate not sampled.



Data Quality Assurance Worksheet

By G. Catarra

Project Name/No./Client: Redmond Paired Watershed Study / 14-05806-000 / City of Redmond

Date 3/12/18 Page 2 of 2

Laboratory/Parameters: OnSite Environmental : TSS, turbidity, hardness, DOC, TP, Dissolved & Total Cu, Zn / AmTest: total nitrogen, fecal coliform bacteria

Checked: initials
JL

Sample Date/Sample ID: 2/01/2018 / All sites, 1 FD (QA44) at MONMS

date 3/22/18

| Parameter | Completeness/ Methodology | Pre-preservation Holding Times (minutes) | | Total Holding Times (days) | | Method Blanks Reporting Limit | Matrix Spikes/ Surrogate Recovery (%) | | Lab Control Samples Recovery (%) | | Lab Duplicates RPD (%) | | Field Duplicates RPD (%) | | Instrument Calibration/ Performance | ACTION |
|------------------|------------------------------|--|------|-------------------------------|------|--|---|-------------------|--|------|---------------------------|-------------------|-----------------------------|-------------------|---|---------------------|
| | | Reported | Goal | Reported | Goal | | Reported | Goal ¹ | Reported | Goal | Reported | Goal ¹ | Reported | Goal ¹ | | |
| Total Copper | OK/ EPA 200.8 | NA | NA | 12 | ≤180 | ≤1.0 µg/L 1.0 µg/L | 107,103 | ±25 | NR | ±15 | 5 | ≤20 | D=0.6 | ≤20 | OK | NONE |
| Total Zinc | OK/ EPA 200.8 | NA | NA | 12 | ≤180 | ≤5.0 µg/L 5.0 µg/L | 113,111 | ±25 | NR | ±15 | 7 | ≤20 | D=0.4 | ≤20 | OK | NONE |
| Dissolved Copper | OK/ EPA 200.8 | <15 | ≤15 | 8-12 | ≤180 | ≤1.0 µg/L 1.0 µg/L | 97,94 | ±25 | NR | ±15 | 6 | ≤20 | DIFF=1.0 | ≤20 | OK | NONE |
| Dissolved Zinc | OK/ EPA 200.8 | <15 | ≤15 | 8-12 | ≤180 | ≤5.0 µg/L 5.0 µg/L | 99,101 | ±25 | NR | ±15 | 6 | ≤20 | NC | ≤20 | OK | NONE |
| Fecal Coliform | OK / SM 9222D | NA | NA | 1 | ≤1 | ≤1.0 cfu/ 100mL 10 cfu/ 100mL | NA | NA | NA | NA | NC, 35 | ≤35 | 78 | ≤50 | OK | "J" MONMS DUE TO FD |

¹ If the sample or duplicate value is less than five times the reporting limit, the difference is calculated rather than the relative percent difference (RPD). The QA goal is a difference <2 times the detection limit instead of the number indicated in the goal column.

NA – not applicable or not available; NC – not calculable due to one or more values below the detection limit; NS – field duplicate not sampled.



14648 NE 95th Street, Redmond, WA 98052 • (425) 883-3881

March 2, 2018

George Iftner
Herrera Environmental Consultants, Inc.
2200 6th Avenue, Suite 1100
Seattle, WA 98121

Re: Analytical Data for Project 14-05806-000
Laboratory Reference No. 1802-126

Dear George:

Enclosed are the analytical results and associated quality control data for samples submitted on February 12, 2018.

The standard policy of OnSite Environmental, Inc. is to store your samples for 30 days from the date of receipt. If you require longer storage, please contact the laboratory.

We appreciate the opportunity to be of service to you on this project. If you have any questions concerning the data, or need additional information, please feel free to call me.

Sincerely,

A handwritten signature in black ink, appearing to read "Blair Goodrow", enclosed within a large, loopy circular flourish.

Blair Goodrow
Project Manager

Enclosures



OnSite Environmental, Inc. 14648 NE 95th Street, Redmond, WA 98052 (425) 883-3881

This report pertains to the samples analyzed in accordance with the chain of custody, and is intended only for the use of the individual or company to whom it is addressed.

Date of Report: March 2, 2018
Samples Submitted: February 12, 2018
Laboratory Reference: 1802-126
Project: 14-05806-000

Case Narrative

Samples were collected on February 12, 2018 and received by the laboratory on February 12, 2018. They were maintained at the laboratory at a temperature of 2°C to 6°C.

Please note that any and all soil sample results are reported on a dry-weight basis, unless otherwise noted below.

General QA/QC issues associated with the analytical data enclosed in this laboratory report will be indicated with a reference to a comment or explanation on the Data Qualifier page. More complex and involved QA/QC issues will be discussed in detail below.



Date of Report: March 2, 2018
 Samples Submitted: February 12, 2018
 Laboratory Reference: 1802-126
 Project: 14-05806-000

**TOTAL SUSPENDED SOLIDS
 SM 2540D**

Matrix: Water
 Units: mg/L

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|------------------------|----------------------|-----|----------|---------------|---------------|-------|
| Client ID: | COLM-20180212 | | | | | |
| Laboratory ID: | 02-126-01 | | | | | |
| Total Suspended Solids | ND | 1.0 | SM 2540D | 2-13-18 | 2-13-18 | |

| | | | | | | |
|------------------------|-----------------------|-----|----------|---------|---------|--|
| Client ID: | COUMI-20180212 | | | | | |
| Laboratory ID: | 02-126-02 | | | | | |
| Total Suspended Solids | 3.4 | 1.0 | SM 2540D | 2-13-18 | 2-13-18 | |

| | | | | | | |
|------------------------|-----------------------|-----|----------|---------|---------|--|
| Client ID: | COUMO-20180212 | | | | | |
| Laboratory ID: | 02-126-03 | | | | | |
| Total Suspended Solids | 2.8 | 1.0 | SM 2540D | 2-13-18 | 2-13-18 | |

| | | | | | | |
|------------------------|-----------------------|-----|----------|---------|---------|--|
| Client ID: | EVAMS-20180212 | | | | | |
| Laboratory ID: | 02-126-04 | | | | | |
| Total Suspended Solids | 3.4 | 1.0 | SM 2540D | 2-13-18 | 2-13-18 | |

| | | | | | | |
|------------------------|------------------------|-----|----------|---------|---------|--|
| Client ID: | EVALSS-20180212 | | | | | |
| Laboratory ID: | 02-126-05 | | | | | |
| Total Suspended Solids | 2.8 | 1.0 | SM 2540D | 2-13-18 | 2-13-18 | |

| | | | | | | |
|------------------------|-----------------------|-----|----------|---------|---------|--|
| Client ID: | MONMN-20180212 | | | | | |
| Laboratory ID: | 02-126-06 | | | | | |
| Total Suspended Solids | 1.0 | 1.0 | SM 2540D | 2-13-18 | 2-13-18 | |

| | | | | | | |
|------------------------|-----------------------|-----|----------|---------|---------|--|
| Client ID: | MONMS-20180212 | | | | | |
| Laboratory ID: | 02-126-07 | | | | | |
| Total Suspended Solids | 2.2 | 1.0 | SM 2540D | 2-13-18 | 2-13-18 | |



Date of Report: March 2, 2018
 Samples Submitted: February 12, 2018
 Laboratory Reference: 1802-126
 Project: 14-05806-000

**TOTAL SUSPENDED SOLIDS
 SM 2540D**

Matrix: Water
 Units: mg/L

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|------------------------|----------------------|-----|----------|---------------|---------------|-------|
| Client ID: | MONM-20180212 | | | | | |
| Laboratory ID: | 02-126-08 | | | | | |
| Total Suspended Solids | 1.6 | 1.0 | SM 2540D | 2-13-18 | 2-13-18 | |

| | | | | | | |
|------------------------|-----------------------|-----|----------|---------|---------|--|
| Client ID: | SEIMN-20180212 | | | | | |
| Laboratory ID: | 02-126-09 | | | | | |
| Total Suspended Solids | 3.8 | 1.0 | SM 2540D | 2-13-18 | 2-13-18 | |

| | | | | | | |
|------------------------|-----------------------|-----|----------|---------|---------|--|
| Client ID: | SEIMS-20180212 | | | | | |
| Laboratory ID: | 02-126-10 | | | | | |
| Total Suspended Solids | 4.2 | 1.0 | SM 2540D | 2-13-18 | 2-13-18 | |

| | | | | | | |
|------------------------|-----------------------|-----|----------|---------|---------|--|
| Client ID: | TOSMI-20180212 | | | | | |
| Laboratory ID: | 02-126-11 | | | | | |
| Total Suspended Solids | 20 | 1.0 | SM 2540D | 2-13-18 | 2-13-18 | |

| | | | | | | |
|------------------------|-----------------------|-----|----------|---------|---------|--|
| Client ID: | TOSMO-20180212 | | | | | |
| Laboratory ID: | 02-126-12 | | | | | |
| Total Suspended Solids | 2.6 | 1.0 | SM 2540D | 2-13-18 | 2-13-18 | |

| | | | | | | |
|------------------------|-----------------------|-----|----------|---------|---------|--|
| Client ID: | TYLMI-20180212 | | | | | |
| Laboratory ID: | 02-126-13 | | | | | |
| Total Suspended Solids | 20 | 1.0 | SM 2540D | 2-13-18 | 2-13-18 | |

| | | | | | | |
|------------------------|-----------------------|-----|----------|---------|---------|--|
| Client ID: | TYLMO-20180212 | | | | | |
| Laboratory ID: | 02-126-14 | | | | | |
| Total Suspended Solids | 1.2 | 1.0 | SM 2540D | 2-13-18 | 2-13-18 | |



Date of Report: March 2, 2018
Samples Submitted: February 12, 2018
Laboratory Reference: 1802-126
Project: 14-05806-000

TOTAL SUSPENDED SOLIDS
SM 2540D

Matrix: Water
Units: mg/L

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|------------------------|----------------------|------------|---------------|----------------------|----------------------|--------------|
| Client ID: | QA45-20180212 | | | | | |
| Laboratory ID: | 02-126-15 | | | | | |
| Total Suspended Solids | 7.2 | 1.0 | SM 2540D | 2-13-18 | 2-13-18 | |



Date of Report: March 2, 2018
 Samples Submitted: February 12, 2018
 Laboratory Reference: 1802-126
 Project: 14-05806-000

**TOTAL SUSPENDED SOLIDS
 SM 2540D
 QUALITY CONTROL**

Matrix: Water
 Units: mg/L

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|------------------------|-----------|-----|----------|---------------|---------------|-------|
| METHOD BLANK | | | | | | |
| Laboratory ID: | MB0213W1 | | | | | |
| Total Suspended Solids | ND | 1.0 | SM 2540D | 2-13-18 | 2-13-18 | |

| Analyte | Result | Spike Level | Source Result | Percent Recovery | Recovery Limits | RPD | RPD Limit | Flags |
|------------------------|-------------|-------------|---------------|------------------|-----------------|-----|-----------|-------|
| DUPLICATE | | | | | | | | |
| Laboratory ID: | 02-079-01 | | | | | | | |
| | ORIG | DUP | | | | | | |
| Total Suspended Solids | 10.0 | 10.0 | NA | NA | NA | NA | 0 | 17 |

| | | | | | | | | |
|------------------------|-------------|-----|----|----|--------|----|----|--|
| SPIKE BLANK | | | | | | | | |
| Laboratory ID: | SB0213W1 | | | | | | | |
| | SB | SB | | SB | | | | |
| Total Suspended Solids | 86.0 | 100 | NA | 86 | 76-114 | NA | NA | |



Date of Report: March 2, 2018
 Samples Submitted: February 12, 2018
 Laboratory Reference: 1802-126
 Project: 14-05806-000

TURBIDITY
EPA 180.1

Matrix: Water
 Units: NTU

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|-------------------|----------------------|------|-----------|---------------|---------------|-------|
| Client ID: | COLM-20180212 | | | | | |
| Laboratory ID: | 02-126-01 | | | | | |
| Turbidity | 0.52 | 0.10 | EPA 180.1 | 2-13-18 | 2-13-18 | |

| | | | | | | |
|-------------------|-----------------------|------|-----------|---------|---------|--|
| Client ID: | COUMI-20180212 | | | | | |
| Laboratory ID: | 02-126-02 | | | | | |
| Turbidity | 1.8 | 0.10 | EPA 180.1 | 2-13-18 | 2-13-18 | |

| | | | | | | |
|-------------------|-----------------------|------|-----------|---------|---------|--|
| Client ID: | COUMO-20180212 | | | | | |
| Laboratory ID: | 02-126-03 | | | | | |
| Turbidity | 1.9 | 0.10 | EPA 180.1 | 2-13-18 | 2-13-18 | |

| | | | | | | |
|-------------------|-----------------------|------|-----------|---------|---------|--|
| Client ID: | EVAMS-20180212 | | | | | |
| Laboratory ID: | 02-126-04 | | | | | |
| Turbidity | 1.3 | 0.10 | EPA 180.1 | 2-13-18 | 2-13-18 | |

| | | | | | | |
|-------------------|------------------------|------|-----------|---------|---------|--|
| Client ID: | EVALSS-20180212 | | | | | |
| Laboratory ID: | 02-126-05 | | | | | |
| Turbidity | 2.0 | 0.10 | EPA 180.1 | 2-13-18 | 2-13-18 | |

| | | | | | | |
|-------------------|-----------------------|------|-----------|---------|---------|--|
| Client ID: | MONMN-20180212 | | | | | |
| Laboratory ID: | 02-126-06 | | | | | |
| Turbidity | 1.2 | 0.10 | EPA 180.1 | 2-13-18 | 2-13-18 | |

| | | | | | | |
|-------------------|-----------------------|------|-----------|---------|---------|--|
| Client ID: | MONMS-20180212 | | | | | |
| Laboratory ID: | 02-126-07 | | | | | |
| Turbidity | 1.5 | 0.10 | EPA 180.1 | 2-13-18 | 2-13-18 | |



Date of Report: March 2, 2018
 Samples Submitted: February 12, 2018
 Laboratory Reference: 1802-126
 Project: 14-05806-000

TURBIDITY
EPA 180.1

Matrix: Water
 Units: NTU

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|-------------------|----------------------|------|-----------|---------------|---------------|-------|
| Client ID: | MONM-20180212 | | | | | |
| Laboratory ID: | 02-126-08 | | | | | |
| Turbidity | 1.2 | 0.10 | EPA 180.1 | 2-13-18 | 2-13-18 | |

| | | | | | | |
|-------------------|-----------------------|------|-----------|---------|---------|--|
| Client ID: | SEIMN-20180212 | | | | | |
| Laboratory ID: | 02-126-09 | | | | | |
| Turbidity | 1.2 | 0.10 | EPA 180.1 | 2-13-18 | 2-13-18 | |

| | | | | | | |
|-------------------|-----------------------|------|-----------|---------|---------|--|
| Client ID: | SEIMS-20180212 | | | | | |
| Laboratory ID: | 02-126-10 | | | | | |
| Turbidity | 2.0 | 0.10 | EPA 180.1 | 2-13-18 | 2-13-18 | |

| | | | | | | |
|-------------------|-----------------------|------|-----------|---------|---------|--|
| Client ID: | TOSMI-20180212 | | | | | |
| Laboratory ID: | 02-126-11 | | | | | |
| Turbidity | 4.0 | 0.10 | EPA 180.1 | 2-13-18 | 2-13-18 | |

| | | | | | | |
|-------------------|-----------------------|------|-----------|---------|---------|--|
| Client ID: | TOSMO-20180212 | | | | | |
| Laboratory ID: | 02-126-12 | | | | | |
| Turbidity | 1.2 | 0.10 | EPA 180.1 | 2-13-18 | 2-13-18 | |

| | | | | | | |
|-------------------|-----------------------|------|-----------|---------|---------|--|
| Client ID: | TYLMI-20180212 | | | | | |
| Laboratory ID: | 02-126-13 | | | | | |
| Turbidity | 8.4 | 0.10 | EPA 180.1 | 2-13-18 | 2-13-18 | |

| | | | | | | |
|-------------------|-----------------------|------|-----------|---------|---------|--|
| Client ID: | TYLMO-20180212 | | | | | |
| Laboratory ID: | 02-126-14 | | | | | |
| Turbidity | 1.6 | 0.10 | EPA 180.1 | 2-13-18 | 2-13-18 | |



Date of Report: March 2, 2018
Samples Submitted: February 12, 2018
Laboratory Reference: 1802-126
Project: 14-05806-000

TURBIDITY
EPA 180.1

Matrix: Water
Units: NTU

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|-------------------|----------------------|------------|---------------|----------------------|----------------------|--------------|
| Client ID: | QA45-20180212 | | | | | |
| Laboratory ID: | 02-126-15 | | | | | |
| Turbidity | 4.3 | 0.10 | EPA 180.1 | 2-13-18 | 2-13-18 | |



Date of Report: March 2, 2018
 Samples Submitted: February 12, 2018
 Laboratory Reference: 1802-126
 Project: 14-05806-000

**TURBIDITY
 EPA 180.1
 QUALITY CONTROL**

Matrix: Water
 Units: NTU

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|---------------------|-----------|------|-----------|---------------|---------------|-------|
| METHOD BLANK | | | | | | |
| Laboratory ID: | MB0213W1 | | | | | |
| Turbidity | ND | 0.10 | EPA 180.1 | 2-13-18 | 2-13-18 | |

| Analyte | Result | Spike Level | Source Result | Percent Recovery | Recovery Limits | RPD | RPD Limit | Flags |
|------------------|--------------|--------------|---------------|------------------|-----------------|-----|-----------|-------|
| DUPLICATE | | | | | | | | |
| Laboratory ID: | 02-126-01 | | | | | | | |
| | ORIG | DUP | | | | | | |
| Turbidity | 0.520 | 0.510 | NA | NA | NA | NA | 2 | 15 |



Date of Report: March 2, 2018
 Samples Submitted: February 12, 2018
 Laboratory Reference: 1802-126
 Project: 14-05806-000

HARDNESS
EPA 200.7/SM 2340B

Matrix: Water
 Units: mg eqt. CaCO₃/L (ppm)

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|-------------------|----------------------|-----|----------------|---------------|---------------|-------|
| Client ID: | COLM-20180212 | | | | | |
| Laboratory ID: | 02-126-01 | | | | | |
| Hardness | 8.2 | 1.0 | 200.7/SM 2340B | 2-20-18 | 2-20-18 | |

| | | | | | | |
|-------------------|-----------------------|-----|----------------|---------|---------|--|
| Client ID: | COUMI-20180212 | | | | | |
| Laboratory ID: | 02-126-02 | | | | | |
| Hardness | 120 | 5.0 | 200.7/SM 2340B | 2-20-18 | 2-21-18 | |

| | | | | | | |
|-------------------|-----------------------|-----|----------------|---------|---------|--|
| Client ID: | COUMO-20180212 | | | | | |
| Laboratory ID: | 02-126-03 | | | | | |
| Hardness | 110 | 1.0 | 200.7/SM 2340B | 2-20-18 | 2-20-18 | |

| | | | | | | |
|-------------------|-----------------------|-----|----------------|---------|---------|--|
| Client ID: | EVAMS-20180212 | | | | | |
| Laboratory ID: | 02-126-04 | | | | | |
| Hardness | 81 | 1.0 | 200.7/SM 2340B | 2-20-18 | 2-20-18 | |

| | | | | | | |
|-------------------|------------------------|-----|----------------|---------|---------|--|
| Client ID: | EVALSS-20180212 | | | | | |
| Laboratory ID: | 02-126-05 | | | | | |
| Hardness | 76 | 1.0 | 200.7/SM 2340B | 2-20-18 | 2-20-18 | |

| | | | | | | |
|-------------------|-----------------------|-----|----------------|---------|---------|--|
| Client ID: | MONMN-20180212 | | | | | |
| Laboratory ID: | 02-126-06 | | | | | |
| Hardness | 59 | 1.0 | 200.7/SM 2340B | 2-20-18 | 2-20-18 | |

| | | | | | | |
|-------------------|-----------------------|-----|----------------|---------|---------|--|
| Client ID: | MONMS-20180212 | | | | | |
| Laboratory ID: | 02-126-07 | | | | | |
| Hardness | 120 | 5.0 | 200.7/SM 2340B | 2-20-18 | 2-21-18 | |



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 Samples Submitted: February 12, 2018
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 Project: 14-05806-000

HARDNESS
EPA 200.7/SM 2340B

Matrix: Water
 Units: mg eqt. CaCO₃/L (ppm)

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|-------------------|----------------------|-----|----------------|---------------|---------------|-------|
| Client ID: | MONM-20180212 | | | | | |
| Laboratory ID: | 02-126-08 | | | | | |
| Hardness | 78 | 1.0 | 200.7/SM 2340B | 2-20-18 | 2-20-18 | |

| | | | | | | |
|-------------------|-----------------------|-----|----------------|---------|---------|--|
| Client ID: | SEIMN-20180212 | | | | | |
| Laboratory ID: | 02-126-09 | | | | | |
| Hardness | 22 | 1.0 | 200.7/SM 2340B | 2-20-18 | 2-20-18 | |

| | | | | | | |
|-------------------|-----------------------|-----|----------------|---------|---------|--|
| Client ID: | SEIMS-20180212 | | | | | |
| Laboratory ID: | 02-126-10 | | | | | |
| Hardness | 40 | 1.0 | 200.7/SM 2340B | 2-20-18 | 2-20-18 | |

| | | | | | | |
|-------------------|-----------------------|-----|----------------|---------|---------|--|
| Client ID: | TOSMI-20180212 | | | | | |
| Laboratory ID: | 02-126-11 | | | | | |
| Hardness | 120 | 5.0 | 200.7/SM 2340B | 2-20-18 | 2-21-18 | |

| | | | | | | |
|-------------------|-----------------------|-----|----------------|---------|---------|--|
| Client ID: | TOSMO-20180212 | | | | | |
| Laboratory ID: | 02-126-12 | | | | | |
| Hardness | 110 | 1.0 | 200.7/SM 2340B | 2-20-18 | 2-20-18 | |

| | | | | | | |
|-------------------|-----------------------|-----|----------------|---------|---------|--|
| Client ID: | TYLMI-20180212 | | | | | |
| Laboratory ID: | 02-126-13 | | | | | |
| Hardness | 75 | 1.0 | 200.7/SM 2340B | 2-20-18 | 2-20-18 | |

| | | | | | | |
|-------------------|-----------------------|-----|----------------|---------|---------|--|
| Client ID: | TYLMO-20180212 | | | | | |
| Laboratory ID: | 02-126-14 | | | | | |
| Hardness | 75 | 1.0 | 200.7/SM 2340B | 2-20-18 | 2-20-18 | |



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HARDNESS
EPA 200.7/SM 2340B

Matrix: Water
Units: mg eqt. CaCO₃/L (ppm)

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|-------------------|----------------------|------------|----------------|----------------------|----------------------|--------------|
| Client ID: | QA45-20180212 | | | | | |
| Laboratory ID: | 02-126-15 | | | | | |
| Hardness | 76 | 1.0 | 200.7/SM 2340B | 2-20-18 | 2-20-18 | |



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HARDNESS
EPA 200.7/SM 2340B
QUALITY CONTROL

Matrix: Water
 Units: mg eqt. CaCO₃/L (ppm)

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|---------------------|-----------|-----|----------------|---------------|---------------|-------|
| METHOD BLANK | | | | | | |
| Laboratory ID: | MB0220WH1 | | | | | |
| Hardness | ND | 1.0 | 200.7/SM 2340B | 2-20-18 | 2-20-18 | |

| Analyte | Result | Spike Level | Source Result | Percent Recovery | Recovery Limits | RPD | RPD Limit | Flags |
|------------------|-------------|-------------|---------------|------------------|-----------------|-----|-----------|-------|
| DUPLICATE | | | | | | | | |
| Laboratory ID: | 02-126-01 | | | | | | | |
| | ORIG | DUP | | | | | | |
| Hardness | 8.16 | 8.17 | NA | NA | NA | NA | 0 | 20 |

| Analyte | Result | Spike Level | Source Result | Percent Recovery | Recovery Limits | RPD | RPD Limit | Flags | | |
|----------------------|------------|-------------|---------------|------------------|-----------------|-----|-----------|--------|---|----|
| MATRIX SPIKES | | | | | | | | | | |
| Laboratory ID: | 02-126-01 | | | | | | | | | |
| | MS | MSD | MS | MSD | MS | MSD | | | | |
| Hardness | 147 | 149 | 132 | 132 | 8.16 | 105 | 107 | 75-125 | 1 | 20 |

| Analyte | Result | Spike Level | Source Result | Percent Recovery | Recovery Limits | RPD | RPD Limit | Flags |
|--------------------|------------|-------------|---------------|------------------|-----------------|-----|-----------|-------|
| SPIKE BLANK | | | | | | | | |
| Laboratory ID: | SB0220WH1 | | | | | | | |
| | SB | SB | | | SB | | | |
| Hardness | 142 | 132 | NA | 108 | 80-120 | NA | NA | |



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 Project: 14-05806-000

**DISSOLVED ORGANIC CARBON
 SM 5310B**

Matrix: Water
 Units: mg/L

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|--------------------------|------------------------|-----|----------|---------------|---------------|-------|
| Client ID: | COLM-20180212 | | | | | |
| Laboratory ID: | 02-126-01 | | | | | |
| Dissolved Organic Carbon | 9.6 | 1.0 | SM 5310B | 2-26-18 | 2-26-18 | |
| Client ID: | COUMI-20180212 | | | | | |
| Laboratory ID: | 02-126-02 | | | | | |
| Dissolved Organic Carbon | 3.3 | 1.0 | SM 5310B | 2-26-18 | 2-26-18 | |
| Client ID: | COUMO-20180212 | | | | | |
| Laboratory ID: | 02-126-03 | | | | | |
| Dissolved Organic Carbon | 3.9 | 1.0 | SM 5310B | 2-26-18 | 2-26-18 | |
| Client ID: | EVAMS-20180212 | | | | | |
| Laboratory ID: | 02-126-04 | | | | | |
| Dissolved Organic Carbon | 4.2 | 1.0 | SM 5310B | 2-26-18 | 2-26-18 | |
| Client ID: | EVALSS-20180212 | | | | | |
| Laboratory ID: | 02-126-05 | | | | | |
| Dissolved Organic Carbon | 3.5 | 1.0 | SM 5310B | 2-26-18 | 2-26-18 | |
| Client ID: | MONMN-20180212 | | | | | |
| Laboratory ID: | 02-126-06 | | | | | |
| Dissolved Organic Carbon | 3.5 | 1.0 | SM 5310B | 2-26-18 | 2-26-18 | |
| Client ID: | MONMS-20180212 | | | | | |
| Laboratory ID: | 02-126-07 | | | | | |
| Dissolved Organic Carbon | 4.7 | 1.0 | SM 5310B | 2-26-18 | 2-26-18 | |



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 Samples Submitted: February 12, 2018
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 Project: 14-05806-000

**DISSOLVED ORGANIC CARBON
 SM 5310B**

Matrix: Water
 Units: mg/L

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|--------------------------|-----------------------|-----|----------|---------------|---------------|-------|
| Client ID: | MONM-20180212 | | | | | |
| Laboratory ID: | 02-126-08 | | | | | |
| Dissolved Organic Carbon | 3.8 | 1.0 | SM 5310B | 2-26-18 | 2-26-18 | |
| Client ID: | SEIMN-20180212 | | | | | |
| Laboratory ID: | 02-126-09 | | | | | |
| Dissolved Organic Carbon | 6.4 | 1.0 | SM 5310B | 2-26-18 | 2-26-18 | |
| Client ID: | SEIMS-20180212 | | | | | |
| Laboratory ID: | 02-126-10 | | | | | |
| Dissolved Organic Carbon | 4.3 | 1.0 | SM 5310B | 2-26-18 | 2-26-18 | |
| Client ID: | TOSMI-20180212 | | | | | |
| Laboratory ID: | 02-126-11 | | | | | |
| Dissolved Organic Carbon | 3.7 | 1.0 | SM 5310B | 2-26-18 | 2-26-18 | |
| Client ID: | TOSMO-20180212 | | | | | |
| Laboratory ID: | 02-126-12 | | | | | |
| Dissolved Organic Carbon | 3.3 | 1.0 | SM 5310B | 2-26-18 | 2-26-18 | |
| Client ID: | TYLMI-20180212 | | | | | |
| Laboratory ID: | 02-126-13 | | | | | |
| Dissolved Organic Carbon | 5.3 | 1.0 | SM 5310B | 2-26-18 | 2-26-18 | |
| Client ID: | TYLMO-20180212 | | | | | |
| Laboratory ID: | 02-126-14 | | | | | |
| Dissolved Organic Carbon | 4.0 | 1.0 | SM 5310B | 2-26-18 | 2-26-18 | |



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Project: 14-05806-000

**DISSOLVED ORGANIC CARBON
SM 5310B**

Matrix: Water
Units: mg/L

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|--------------------------|----------------------|------------|---------------|----------------------|----------------------|--------------|
| Client ID: | QA45-20180212 | | | | | |
| Laboratory ID: | 02-126-15 | | | | | |
| Dissolved Organic Carbon | 5.5 | 1.0 | SM 5310B | 2-26-18 | 2-26-18 | |



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 Project: 14-05806-000

**DISSOLVED ORGANIC CARBON
 SM 5310B
 QUALITY CONTROL**

Matrix: Water
 Units: mg/L

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|--------------------------|-----------|-----|----------|---------------|---------------|-------|
| METHOD BLANK | | | | | | |
| Laboratory ID: | MB0226D1 | | | | | |
| Dissolved Organic Carbon | ND | 1.0 | SM 5310B | 2-26-18 | 2-26-18 | |

| Analyte | Result | Spike Level | Source Result | Percent Recovery | Recovery Limits | RPD | RPD Limit | Flags |
|--------------------------|-------------|-------------|---------------|------------------|-----------------|-----|-----------|-------|
| DUPLICATE | | | | | | | | |
| Laboratory ID: | 02-126-01 | | | | | | | |
| | ORIG | DUP | | | | | | |
| Dissolved Organic Carbon | 9.56 | 9.75 | NA | NA | NA | 2 | 15 | |

MATRIX SPIKE

| | | | | | | | | |
|--------------------------|-------------|------|------|----|--------|----|----|--|
| Laboratory ID: | 02-126-01 | | | | | | | |
| | MS | MS | | MS | | | | |
| Dissolved Organic Carbon | 19.3 | 10.0 | 9.56 | 97 | 75-125 | NA | NA | |

SPIKE BLANK

| | | | | | | | | |
|--------------------------|-------------|------|----|-----|--------|----|----|--|
| Laboratory ID: | SB0226D1 | | | | | | | |
| | SB | SB | | SB | | | | |
| Dissolved Organic Carbon | 10.4 | 10.0 | NA | 104 | 80-120 | NA | NA | |



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TOTAL PHOSPHORUS
EPA 365.1

Matrix: Water
 Units: mg/L

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|-------------------|----------------------|-------|-----------|---------------|---------------|-------|
| Client ID: | COLM-20180212 | | | | | |
| Laboratory ID: | 02-126-01 | | | | | |
| Total Phosphorus | ND | 0.010 | EPA 365.1 | 2-20-18 | 2-27-18 | |

| | | | | | | |
|-------------------|-----------------------|-------|-----------|---------|---------|--|
| Client ID: | COUMI-20180212 | | | | | |
| Laboratory ID: | 02-126-02 | | | | | |
| Total Phosphorus | 0.056 | 0.010 | EPA 365.1 | 2-20-18 | 2-27-18 | |

| | | | | | | |
|-------------------|-----------------------|-------|-----------|---------|---------|--|
| Client ID: | COUMO-20180212 | | | | | |
| Laboratory ID: | 02-126-03 | | | | | |
| Total Phosphorus | 0.035 | 0.010 | EPA 365.1 | 2-20-18 | 2-27-18 | |

| | | | | | | |
|-------------------|-----------------------|-------|-----------|---------|---------|--|
| Client ID: | EVAMS-20180212 | | | | | |
| Laboratory ID: | 02-126-04 | | | | | |
| Total Phosphorus | ND | 0.010 | EPA 365.1 | 2-20-18 | 2-27-18 | |

| | | | | | | |
|-------------------|------------------------|-------|-----------|---------|---------|--|
| Client ID: | EVALSS-20180212 | | | | | |
| Laboratory ID: | 02-126-05 | | | | | |
| Total Phosphorus | ND | 0.010 | EPA 365.1 | 2-20-18 | 2-27-18 | |

| | | | | | | |
|-------------------|-----------------------|-------|-----------|---------|---------|--|
| Client ID: | MONMN-20180212 | | | | | |
| Laboratory ID: | 02-126-06 | | | | | |
| Total Phosphorus | 0.011 | 0.010 | EPA 365.1 | 2-20-18 | 2-27-18 | |

| | | | | | | |
|-------------------|-----------------------|-------|-----------|---------|---------|--|
| Client ID: | MONMS-20180212 | | | | | |
| Laboratory ID: | 02-126-07 | | | | | |
| Total Phosphorus | 0.023 | 0.010 | EPA 365.1 | 2-20-18 | 2-27-18 | |



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 Project: 14-05806-000

TOTAL PHOSPHORUS
EPA 365.1

Matrix: Water
 Units: mg/L

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|-------------------|----------------------|-------|-----------|---------------|---------------|-------|
| Client ID: | MONM-20180212 | | | | | |
| Laboratory ID: | 02-126-08 | | | | | |
| Total Phosphorus | ND | 0.010 | EPA 365.1 | 2-20-18 | 2-27-18 | |

| | | | | | | |
|-------------------|-----------------------|-------|-----------|---------|---------|--|
| Client ID: | SEIMN-20180212 | | | | | |
| Laboratory ID: | 02-126-09 | | | | | |
| Total Phosphorus | ND | 0.010 | EPA 365.1 | 2-20-18 | 2-27-18 | |

| | | | | | | |
|-------------------|-----------------------|-------|-----------|---------|---------|--|
| Client ID: | SEIMS-20180212 | | | | | |
| Laboratory ID: | 02-126-10 | | | | | |
| Total Phosphorus | 0.013 | 0.010 | EPA 365.1 | 2-20-18 | 2-27-18 | |

| | | | | | | |
|-------------------|-----------------------|-------|-----------|---------|---------|--|
| Client ID: | TOSMI-20180212 | | | | | |
| Laboratory ID: | 02-126-11 | | | | | |
| Total Phosphorus | 0.031 | 0.010 | EPA 365.1 | 2-20-18 | 2-27-18 | |

| | | | | | | |
|-------------------|-----------------------|-------|-----------|---------|---------|--|
| Client ID: | TOSMO-20180212 | | | | | |
| Laboratory ID: | 02-126-12 | | | | | |
| Total Phosphorus | 0.042 | 0.010 | EPA 365.1 | 2-20-18 | 2-27-18 | |

| | | | | | | |
|-------------------|-----------------------|-------|-----------|---------|---------|--|
| Client ID: | TYLMI-20180212 | | | | | |
| Laboratory ID: | 02-126-13 | | | | | |
| Total Phosphorus | 0.013 | 0.010 | EPA 365.1 | 2-20-18 | 2-27-18 | |

| | | | | | | |
|-------------------|-----------------------|-------|-----------|---------|---------|--|
| Client ID: | TYLMO-20180212 | | | | | |
| Laboratory ID: | 02-126-14 | | | | | |
| Total Phosphorus | 0.019 | 0.010 | EPA 365.1 | 2-20-18 | 2-27-18 | |



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TOTAL PHOSPHORUS
EPA 365.1

Matrix: Water
Units: mg/L

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|-------------------|----------------------|------------|---------------|----------------------|----------------------|--------------|
| Client ID: | QA45-20180212 | | | | | |
| Laboratory ID: | 02-126-15 | | | | | |
| Total Phosphorus | 0.027 | 0.010 | EPA 365.1 | 2-20-18 | 2-27-18 | |



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**TOTAL PHOSPHORUS
 EPA 365.1
 QUALITY CONTROL**

Matrix: Water
 Units: mg/L

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|---------------------|-----------|-------|-----------|---------------|---------------|-------|
| METHOD BLANK | | | | | | |
| Laboratory ID: | MB0220W1 | | | | | |
| Total Phosphorus | ND | 0.010 | EPA 365.1 | 2-20-18 | 2-27-18 | |

| Analyte | Result | Spike Level | Source Result | Percent Recovery | Recovery Limits | RPD | RPD Limit | Flags |
|------------------|-----------|-------------|---------------|------------------|-----------------|-----|-----------|-------|
| DUPLICATE | | | | | | | | |
| Laboratory ID: | 02-126-01 | | | | | | | |
| | ORIG | DUP | | | | | | |
| Total Phosphorus | ND | ND | NA | NA | NA | NA | 11 | |

| | | | | | | | | |
|---------------------|--------------|-------|----|-----|--------|----|----|--|
| MATRIX SPIKE | | | | | | | | |
| Laboratory ID: | 02-126-01 | | | | | | | |
| | MS | MS | | MS | | | | |
| Total Phosphorus | 0.266 | 0.250 | ND | 106 | 82-124 | NA | NA | |

| | | | | | | | | |
|--------------------|--------------|-------|----|-----|--------|----|----|--|
| SPIKE BLANK | | | | | | | | |
| Laboratory ID: | SB0220W1 | | | | | | | |
| | SB | SB | | SB | | | | |
| Total Phosphorus | 0.258 | 0.250 | NA | 103 | 87-114 | NA | NA | |



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 Project: 14-05806-000

TOTAL METALS
EPA 200.8

Matrix: Water
 Units: ug/L (ppb)

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|-------------------|----------------------|-----|-----------|---------------|---------------|-------|
| Client ID: | COLM-20180212 | | | | | |
| Laboratory ID: | 02-126-01 | | | | | |
| Copper | ND | 1.0 | EPA 200.8 | 2-20-18 | 2-20-18 | |
| Zinc | ND | 5.0 | EPA 200.8 | 2-20-18 | 2-20-18 | |

| | | | | | | |
|-------------------|-----------------------|-----|-----------|---------|---------|--|
| Client ID: | COUMI-20180212 | | | | | |
| Laboratory ID: | 02-126-02 | | | | | |
| Copper | ND | 1.0 | EPA 200.8 | 2-20-18 | 2-20-18 | |
| Zinc | ND | 5.0 | EPA 200.8 | 2-20-18 | 2-20-18 | |

| | | | | | | |
|-------------------|-----------------------|-----|-----------|---------|---------|--|
| Client ID: | COUMO-20180212 | | | | | |
| Laboratory ID: | 02-126-03 | | | | | |
| Copper | ND | 1.0 | EPA 200.8 | 2-20-18 | 2-20-18 | |
| Zinc | 5.7 | 5.0 | EPA 200.8 | 2-20-18 | 2-20-18 | |

| | | | | | | |
|-------------------|-----------------------|-----|-----------|---------|---------|--|
| Client ID: | EVAMS-20180212 | | | | | |
| Laboratory ID: | 02-126-04 | | | | | |
| Copper | ND | 1.0 | EPA 200.8 | 2-20-18 | 2-20-18 | |
| Zinc | ND | 5.0 | EPA 200.8 | 2-20-18 | 2-20-18 | |

| | | | | | | |
|-------------------|------------------------|-----|-----------|---------|---------|--|
| Client ID: | EVALSS-20180212 | | | | | |
| Laboratory ID: | 02-126-05 | | | | | |
| Copper | ND | 1.0 | EPA 200.8 | 2-20-18 | 2-20-18 | |
| Zinc | ND | 5.0 | EPA 200.8 | 2-20-18 | 2-20-18 | |

| | | | | | | |
|-------------------|-----------------------|-----|-----------|---------|---------|--|
| Client ID: | MONMN-20180212 | | | | | |
| Laboratory ID: | 02-126-06 | | | | | |
| Copper | ND | 1.0 | EPA 200.8 | 2-20-18 | 2-20-18 | |
| Zinc | ND | 5.0 | EPA 200.8 | 2-20-18 | 2-20-18 | |

| | | | | | | |
|-------------------|-----------------------|-----|-----------|---------|---------|--|
| Client ID: | MONMS-20180212 | | | | | |
| Laboratory ID: | 02-126-07 | | | | | |
| Copper | 1.1 | 1.0 | EPA 200.8 | 2-20-18 | 2-20-18 | |
| Zinc | ND | 5.0 | EPA 200.8 | 2-20-18 | 2-20-18 | |



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**TOTAL METALS
 EPA 200.8**

Matrix: Water
 Units: ug/L (ppb)

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|-------------------|----------------------|-----|-----------|---------------|---------------|-------|
| Client ID: | MONM-20180212 | | | | | |
| Laboratory ID: | 02-126-08 | | | | | |
| Copper | ND | 1.0 | EPA 200.8 | 2-20-18 | 2-20-18 | |
| Zinc | 6.9 | 5.0 | EPA 200.8 | 2-20-18 | 2-20-18 | |

| | | | | | | |
|-------------------|-----------------------|-----|-----------|---------|---------|--|
| Client ID: | SEIMN-20180212 | | | | | |
| Laboratory ID: | 02-126-09 | | | | | |
| Copper | ND | 1.0 | EPA 200.8 | 2-20-18 | 2-20-18 | |
| Zinc | ND | 5.0 | EPA 200.8 | 2-20-18 | 2-20-18 | |

| | | | | | | |
|-------------------|-----------------------|-----|-----------|---------|---------|--|
| Client ID: | SEIMS-20180212 | | | | | |
| Laboratory ID: | 02-126-10 | | | | | |
| Copper | ND | 1.0 | EPA 200.8 | 2-20-18 | 2-20-18 | |
| Zinc | ND | 5.0 | EPA 200.8 | 2-20-18 | 2-20-18 | |

| | | | | | | |
|-------------------|-----------------------|-----|-----------|---------|---------|--|
| Client ID: | TOSMI-20180212 | | | | | |
| Laboratory ID: | 02-126-11 | | | | | |
| Copper | 1.9 | 1.0 | EPA 200.8 | 2-20-18 | 2-20-18 | |
| Zinc | 29 | 5.0 | EPA 200.8 | 2-20-18 | 2-20-18 | |

| | | | | | | |
|-------------------|-----------------------|-----|-----------|---------|---------|--|
| Client ID: | TOSMO-20180212 | | | | | |
| Laboratory ID: | 02-126-12 | | | | | |
| Copper | 1.0 | 1.0 | EPA 200.8 | 2-20-18 | 2-20-18 | |
| Zinc | 15 | 5.0 | EPA 200.8 | 2-20-18 | 2-20-18 | |

| | | | | | | |
|-------------------|-----------------------|-----|-----------|---------|---------|--|
| Client ID: | TYLMI-20180212 | | | | | |
| Laboratory ID: | 02-126-13 | | | | | |
| Copper | 2.1 | 1.0 | EPA 200.8 | 2-20-18 | 2-20-18 | |
| Zinc | 5.6 | 5.0 | EPA 200.8 | 2-20-18 | 2-20-18 | |

| | | | | | | |
|-------------------|-----------------------|-----|-----------|---------|---------|--|
| Client ID: | TYLMO-20180212 | | | | | |
| Laboratory ID: | 02-126-14 | | | | | |
| Copper | 2.1 | 1.0 | EPA 200.8 | 2-20-18 | 2-20-18 | |
| Zinc | 12 | 5.0 | EPA 200.8 | 2-20-18 | 2-20-18 | |



Date of Report: March 2, 2018
Samples Submitted: February 12, 2018
Laboratory Reference: 1802-126
Project: 14-05806-000

TOTAL METALS
EPA 200.8

Matrix: Water
Units: ug/L (ppb)

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|-------------------|----------------------|------------|---------------|----------------------|----------------------|--------------|
| Client ID: | QA45-20180212 | | | | | |
| Laboratory ID: | 02-126-15 | | | | | |
| Copper | 2.0 | 1.0 | EPA 200.8 | 2-20-18 | 2-20-18 | |
| Zinc | 6.0 | 5.0 | EPA 200.8 | 2-20-18 | 2-20-18 | |



Date of Report: March 2, 2018
 Samples Submitted: February 12, 2018
 Laboratory Reference: 1802-126
 Project: 14-05806-000

**TOTAL METALS
 EPA 200.8
 QUALITY CONTROL**

Matrix: Water
 Units: ug/L (ppb)

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|---------------------|-----------|-----|-----------|---------------|---------------|-------|
| METHOD BLANK | | | | | | |
| Laboratory ID: | MB0220WH1 | | | | | |
| Copper | ND | 1.0 | EPA 200.8 | 2-20-18 | 2-20-18 | |
| Zinc | ND | 5.0 | EPA 200.8 | 2-20-18 | 2-20-18 | |

| Analyte | Result | Spike Level | Source Result | Percent Recovery | Recovery Limits | RPD | RPD Limit | Flags |
|------------------|-----------|-------------|---------------|------------------|-----------------|-----|-----------|-------|
| DUPLICATE | | | | | | | | |
| Laboratory ID: | 02-126-04 | | | | | | | |
| | ORIG | DUP | | | | | | |
| Copper | ND | ND | NA | NA | NA | NA | 20 | |
| Zinc | ND | ND | NA | NA | NA | NA | 20 | |

MATRIX SPIKES

| | | | | | | | | | | |
|----------------|-----------|-----|-----|-----|----|-----|-----|--------|---|----|
| Laboratory ID: | 02-126-04 | | | | | | | | | |
| | MS | MSD | MS | MSD | | MS | MSD | | | |
| Copper | 111 | 110 | 100 | 100 | ND | 111 | 110 | 75-125 | 1 | 20 |
| Zinc | 114 | 114 | 100 | 100 | ND | 114 | 114 | 75-125 | 0 | 20 |



Date of Report: March 2, 2018
 Samples Submitted: February 12, 2018
 Laboratory Reference: 1802-126
 Project: 14-05806-000

**DISSOLVED METALS
 EPA 200.8**

Matrix: Water
 Units: ug/L (ppb)

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|-------------------|----------------------|-----|-----------|---------------|---------------|-------|
| Client ID: | COLM-20180212 | | | | | |
| Laboratory ID: | 02-126-01 | | | | | |
| Copper | ND | 1.0 | EPA 200.8 | | 2-20-18 | |
| Zinc | ND | 5.0 | EPA 200.8 | | 2-20-18 | |

| | | | | | | |
|-------------------|-----------------------|-----|-----------|--|---------|--|
| Client ID: | COUMI-20180212 | | | | | |
| Laboratory ID: | 02-126-02 | | | | | |
| Copper | ND | 1.0 | EPA 200.8 | | 2-20-18 | |
| Zinc | ND | 5.0 | EPA 200.8 | | 2-20-18 | |

| | | | | | | |
|-------------------|-----------------------|-----|-----------|--|---------|--|
| Client ID: | COUMO-20180212 | | | | | |
| Laboratory ID: | 02-126-03 | | | | | |
| Copper | ND | 1.0 | EPA 200.8 | | 2-20-18 | |
| Zinc | ND | 5.0 | EPA 200.8 | | 2-20-18 | |

| | | | | | | |
|-------------------|-----------------------|-----|-----------|--|---------|--|
| Client ID: | EVAMS-20180212 | | | | | |
| Laboratory ID: | 02-126-04 | | | | | |
| Copper | ND | 1.0 | EPA 200.8 | | 2-20-18 | |
| Zinc | ND | 5.0 | EPA 200.8 | | 2-20-18 | |

| | | | | | | |
|-------------------|------------------------|-----|-----------|--|---------|--|
| Client ID: | EVALSS-20180212 | | | | | |
| Laboratory ID: | 02-126-05 | | | | | |
| Copper | ND | 1.0 | EPA 200.8 | | 2-20-18 | |
| Zinc | ND | 5.0 | EPA 200.8 | | 2-20-18 | |

| | | | | | | |
|-------------------|-----------------------|-----|-----------|--|---------|--|
| Client ID: | MONMN-20180212 | | | | | |
| Laboratory ID: | 02-126-06 | | | | | |
| Copper | ND | 1.0 | EPA 200.8 | | 2-20-18 | |
| Zinc | ND | 5.0 | EPA 200.8 | | 2-20-18 | |

| | | | | | | |
|-------------------|-----------------------|-----|-----------|--|---------|--|
| Client ID: | MONMS-20180212 | | | | | |
| Laboratory ID: | 02-126-07 | | | | | |
| Copper | ND | 1.0 | EPA 200.8 | | 2-20-18 | |
| Zinc | ND | 5.0 | EPA 200.8 | | 2-20-18 | |



Date of Report: March 2, 2018
 Samples Submitted: February 12, 2018
 Laboratory Reference: 1802-126
 Project: 14-05806-000

**DISSOLVED METALS
 EPA 200.8**

Matrix: Water
 Units: ug/L (ppb)

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|-------------------|----------------------|-----|-----------|---------------|---------------|-------|
| Client ID: | MONM-20180212 | | | | | |
| Laboratory ID: | 02-126-08 | | | | | |
| Copper | ND | 1.0 | EPA 200.8 | | 2-20-18 | |
| Zinc | 6.9 | 5.0 | EPA 200.8 | | 2-20-18 | |

| | | | | | | |
|-------------------|-----------------------|-----|-----------|--|---------|--|
| Client ID: | SEIMN-20180212 | | | | | |
| Laboratory ID: | 02-126-09 | | | | | |
| Copper | ND | 1.0 | EPA 200.8 | | 2-20-18 | |
| Zinc | ND | 5.0 | EPA 200.8 | | 2-20-18 | |

| | | | | | | |
|-------------------|-----------------------|-----|-----------|--|---------|--|
| Client ID: | SEIMS-20180212 | | | | | |
| Laboratory ID: | 02-126-10 | | | | | |
| Copper | ND | 1.0 | EPA 200.8 | | 2-20-18 | |
| Zinc | ND | 5.0 | EPA 200.8 | | 2-20-18 | |

| | | | | | | |
|-------------------|-----------------------|-----|-----------|--|---------|--|
| Client ID: | TOSMI-20180212 | | | | | |
| Laboratory ID: | 02-126-11 | | | | | |
| Copper | 1.5 | 1.0 | EPA 200.8 | | 2-20-18 | |
| Zinc | 24 | 5.0 | EPA 200.8 | | 2-20-18 | |

| | | | | | | |
|-------------------|-----------------------|-----|-----------|--|---------|--|
| Client ID: | TOSMO-20180212 | | | | | |
| Laboratory ID: | 02-126-12 | | | | | |
| Copper | ND | 1.0 | EPA 200.8 | | 2-20-18 | |
| Zinc | 14 | 5.0 | EPA 200.8 | | 2-20-18 | |

| | | | | | | |
|-------------------|-----------------------|-----|-----------|--|---------|--|
| Client ID: | TYLMI-20180212 | | | | | |
| Laboratory ID: | 02-126-13 | | | | | |
| Copper | 2.6 | 1.0 | EPA 200.8 | | 2-20-18 | |
| Zinc | 5.8 | 5.0 | EPA 200.8 | | 2-20-18 | |

| | | | | | | |
|-------------------|-----------------------|-----|-----------|--|---------|--|
| Client ID: | TYLMO-20180212 | | | | | |
| Laboratory ID: | 02-126-14 | | | | | |
| Copper | 1.1 | 1.0 | EPA 200.8 | | 2-20-18 | |
| Zinc | 6.5 | 5.0 | EPA 200.8 | | 2-20-18 | |



Date of Report: March 2, 2018
Samples Submitted: February 12, 2018
Laboratory Reference: 1802-126
Project: 14-05806-000

DISSOLVED METALS
EPA 200.8

Matrix: Water
Units: ug/L (ppb)

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|-------------------|----------------------|------------|---------------|----------------------|----------------------|--------------|
| Client ID: | QA45-20180212 | | | | | |
| Laboratory ID: | 02-126-15 | | | | | |
| Copper | 1.6 | 1.0 | EPA 200.8 | | 2-20-18 | |
| Zinc | 6.2 | 5.0 | EPA 200.8 | | 2-20-18 | |



Date of Report: March 2, 2018
 Samples Submitted: February 12, 2018
 Laboratory Reference: 1802-126
 Project: 14-05806-000

**DISSOLVED METALS
 EPA 200.8
 QUALITY CONTROL**

Matrix: Water
 Units: ug/L (ppb)

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|---------------------|-----------|-----|-----------|---------------|---------------|-------|
| METHOD BLANK | | | | | | |
| Laboratory ID: | MB0220D1 | | | | | |
| Copper | ND | 1.0 | EPA 200.8 | | 2-20-18 | |
| Zinc | ND | 5.0 | EPA 200.8 | | 2-20-18 | |

| Analyte | Result | Spike Level | Source Result | Percent Recovery | Recovery Limits | RPD | RPD Limit | Flags |
|------------------|-------------|-------------|---------------|------------------|-----------------|-----|-----------|-------|
| DUPLICATE | | | | | | | | |
| Laboratory ID: | 02-126-15 | | | | | | | |
| | ORIG | DUP | | | | | | |
| Copper | 1.64 | 1.69 | NA | NA | NA | NA | 3 | 20 |
| Zinc | 6.16 | 6.12 | NA | NA | NA | NA | 1 | 20 |

MATRIX SPIKES

| | | | | | | | | | | |
|----------------|-------------|-------------|------|------|------|-----------|-----------|--------|---|----|
| Laboratory ID: | 02-126-15 | | | | | | | | | |
| | MS | MSD | MS | MSD | | MS | MSD | | | |
| Copper | 71.8 | 68.8 | 80.0 | 80.0 | 1.64 | 88 | 84 | 75-125 | 4 | 20 |
| Zinc | 82.2 | 82.6 | 80.0 | 80.0 | 6.16 | 95 | 96 | 75-125 | 0 | 20 |





Data Qualifiers and Abbreviations

- A - Due to a high sample concentration, the amount spiked is insufficient for meaningful MS/MSD recovery data.
 - B - The analyte indicated was also found in the blank sample.
 - C - The duplicate RPD is outside control limits due to high result variability when analyte concentrations are within five times the quantitation limit.
 - E - The value reported exceeds the quantitation range and is an estimate.
 - F - Surrogate recovery data is not available due to the high concentration of coeluting target compounds.
 - H - The analyte indicated is a common laboratory solvent and may have been introduced during sample preparation, and be impacting the sample result.
 - I - Compound recovery is outside of the control limits.
 - J - The value reported was below the practical quantitation limit. The value is an estimate.
 - K - Sample duplicate RPD is outside control limits due to sample inhomogeneity. The sample was re-extracted and re-analyzed with similar results.
 - L - The RPD is outside of the control limits.
 - M - Hydrocarbons in the gasoline range are impacting the diesel range result.
 - M1 - Hydrocarbons in the gasoline range (toluene-naphthalene) are present in the sample.
 - N - Hydrocarbons in the lube oil range are impacting the diesel range result.
 - N1 - Hydrocarbons in diesel range are impacting lube oil range results.
 - O - Hydrocarbons indicative of heavier fuels are present in the sample and are impacting the gasoline result.
 - P - The RPD of the detected concentrations between the two columns is greater than 40.
 - Q - Surrogate recovery is outside of the control limits.
 - S - Surrogate recovery data is not available due to the necessary dilution of the sample.
 - T - The sample chromatogram is not similar to a typical _____.
 - U - The analyte was analyzed for, but was not detected above the reported sample quantitation limit.
 - U1 - The practical quantitation limit is elevated due to interferences present in the sample.
 - V - Matrix Spike/Matrix Spike Duplicate recoveries are outside control limits due to matrix effects.
 - W - Matrix Spike/Matrix Spike Duplicate RPD are outside control limits due to matrix effects.
 - X - Sample extract treated with a mercury cleanup procedure.
 - X1 - Sample extract treated with a sulfuric acid/silica gel cleanup procedure.
 - Y - The calibration verification for this analyte exceeded the 20% drift specified in method 8260C, and therefore the reported result should be considered an estimate. The overall performance of the calibration verification standard met the acceptance criteria of the method.
 - Z -
- ND - Not Detected at PQL
 PQL - Practical Quantitation Limit
 RPD - Relative Percent Difference





Am Test Inc.
13600 NE 126TH PL
Suite C
Kirkland, WA 98034
(425) 885-1664

**Professional
Analytical
Services**

Feb 27 2018
On-Site Environmental
14648 NE 95th ST
Redmond, WA 98052
Attention: David Baumeister

Dear David Baumeister:

Enclosed please find the analytical data for your REDMOND PAIRED WATERSHED STUDY project.

The following is a cross correlation of client and laboratory identifications for your convenience.

| CLIENT ID | MATRIX | AMTEST ID | TEST |
|-----------------|--------|------------|------------|
| COLM-20180212 | Water | 18-A002723 | Micro, NUT |
| COUMI-20180212 | Water | 18-A002724 | Micro, NUT |
| COUMO-20180212 | Water | 18-A002725 | Micro, NUT |
| EVAMS-20180212 | Water | 18-A002726 | Micro, NUT |
| EVALSS-20180212 | Water | 18-A002727 | Micro, NUT |
| MONMN-20180212 | Water | 18-A002728 | Micro, NUT |
| MONMS-20180212 | Water | 18-A002729 | Micro, NUT |
| MONM-20180212 | Water | 18-A002730 | Micro, NUT |
| SEIMN-20180212 | Water | 18-A002731 | Micro, NUT |
| SEIMS-20180212 | Water | 18-A002732 | Micro, NUT |
| TOSMI-20180212 | Water | 18-A002733 | Micro, NUT |
| TOSMO-20180212 | Water | 18-A002734 | Micro, NUT |
| TYLMI-20180212 | Water | 18-A002735 | Micro, NUT |
| TYLMO-20180212 | Water | 18-A002736 | Micro, NUT |
| QA-45-20180212 | Water | 18-A002737 | Micro, NUT |

Your samples were received on Tuesday, February 13, 2018. At the time of receipt, the samples were logged in and properly maintained prior to the subsequent analysis.

The analytical procedures used at AmTest are well documented and are typically derived from the protocols of the EPA, USDA, FDA or the Army Corps of Engineers.

Following the analytical data you will find the Quality Control (QC) results.

Please note that the detection limits that are listed in the body of the report refer to the Practical Quantitation Limits (PQL's), as opposed to the Method Detection Limits (MDL's).

Am Test Inc.
13600 NE 126TH PL
Suite C
Kirkland, WA 98034
(425) 885-1664

**Professional
Analytical
Services**

Feb 27 2018
On-Site Environmental
continued . . .

If you should have any questions pertaining to the data package, please feel free to contact me.

Sincerely,


Aaron W. Young
Laboratory Manager

Project #: 14-05806-000
PO Number: 02-126

BACT = Bacteriological
CONV = Conventional

MET = Metals
ORG = Organics

NUT=Nutrients
DEM=Demand

MIN=Minerals

Am Test Inc.
13600 NE 126TH PL
Suite C
Kirkland, WA 98034
(425) 885-1664
www.amtestlab.com



Professional
Analytical
Services

ANALYSIS REPORT

On-Site Environmental
14648 NE 95th ST
Redmond, WA 98052
Attention: David Baumeister
Project Name: REDMOND PAIRED WATERSHED STUDY
Project #: 14-05806-000
PO Number: 02-126
All results reported on an as received basis.

Date Received: 02/13/18
Date Reported: 2/27/18

AMTEST Identification Number 18-A002723
Client Identification COLM-20180212
Sampling Date 02/12/18, 16:00

Results

| PARAMETER | RESULT | UNITS | Q | D.L. | METHOD | ANALYST | DATE |
|--------------------------|--------|------------|---|------|-----------|---------|----------|
| Fecal Coliform | 2. | CFU/100 ml | | 1 | SM 9222D | NG | 02/13/18 |
| Total Nitrogen (NOX&TKN) | 0.55 | mg/l | | 0.1 | | | |
| Total Nitrogen (TKN) | 0.520 | mg/l | | 0.1 | SM4500N | JC | 02/23/18 |
| Nitrate + Nitrite | 0.032 | mg/l | | 0.01 | SM4500NO3 | JC | 02/20/18 |

AMTEST Identification Number **18-A002724**
Client Identification **COUMI-20180212**
Sampling Date **02/12/18, 09:20**

Results

| PARAMETER | RESULT | UNITS | Q | D.L. | METHOD | ANALYST | DATE |
|--------------------------|--------|------------|---|------|-----------|---------|----------|
| Fecal Coliform | 2. | CFU/100 ml | | 1 | SM 9222D | NG | 02/13/18 |
| Total Nitrogen (NOX&TKN) | 0.70 | mg/l | | 0.1 | | | |
| Total Nitrogen (TKN) | 0.404 | mg/l | | 0.1 | SM4500N | JC | 02/23/18 |
| Nitrate + Nitrite | 0.30 | mg/l | | 0.01 | SM4500NO3 | JC | 02/20/18 |

AMTEST Identification Number **18-A002725**
Client Identification **COUMO-20180212**
Sampling Date **02/12/18, 09:40**

Results

| PARAMETER | RESULT | UNITS | Q | D.L. | METHOD | ANALYST | DATE |
|--------------------------|--------|------------|---|------|-----------|---------|----------|
| Fecal Coliform | 200 | CFU/100 ml | | 1 | SM 9222D | NG | 02/13/18 |
| Total Nitrogen (NOX&TKN) | 0.84 | mg/l | | 0.1 | | | |
| Total Nitrogen (TKN) | 0.355 | mg/l | | 0.1 | SM4500N | JC | 02/23/18 |
| Nitrate + Nitrite | 0.48 | mg/l | | 0.01 | SM4500NO3 | JC | 02/20/18 |

AMTEST Identification Number 18-A002726
Client Identification EVAMS-20180212
Sampling Date 02/12/18, 10:45

Results

| PARAMETER | RESULT | UNITS | Q | D.L. | METHOD | ANALYST | DATE |
|--------------------------|--------|------------|---|------|-----------|---------|----------|
| Fecal Coliform | 22. | CFU/100 ml | | 1 | SM 9222D | NG | 02/13/18 |
| Total Nitrogen (NOX&TKN) | 2.41 | mg/l | | 0.1 | | | |
| Total Nitrogen (TKN) | 0.513 | mg/l | | 0.1 | SM4500N | JC | 02/23/18 |
| Nitrate + Nitrite | 1.9 | mg/l | | 0.01 | SM4500NO3 | JC | 02/20/18 |

AMTEST Identification Number 18-A002727
Client Identification EVALSS-20180212
Sampling Date 02/12/18, 11:05

Results

| PARAMETER | RESULT | UNITS | Q | D.L. | METHOD | ANALYST | DATE |
|--------------------------|--------|------------|---|------|-----------|---------|----------|
| Fecal Coliform | 14. | CFU/100 ml | | 1 | SM 9222D | NG | 02/13/18 |
| Total Nitrogen (NOX&TKN) | 1.92 | mg/l | | 0.1 | | | |
| Total Nitrogen (TKN) | 0.424 | mg/l | | 0.1 | SM4500N | JC | 02/23/18 |
| Nitrate + Nitrite | 1.5 | mg/l | | 0.01 | SM4500NO3 | JC | 02/20/18 |

AMTEST Identification Number **18-A002728**
Client Identification **MONMN-20180212**
Sampling Date **02/12/18, 12:45**

Results

| PARAMETER | RESULT | UNITS | Q | D.L. | METHOD | ANALYST | DATE |
|--------------------------|--------|------------|---|------|-----------|---------|----------|
| Fecal Coliform | 2. | CFU/100 ml | | 1 | SM 9222D | NG | 02/13/18 |
| Total Nitrogen (NOX&TKN) | 0.44 | mg/l | | 0.1 | | | |
| Total Nitrogen (TKN) | 0.371 | mg/l | | 0.1 | SM4500N | JC | 02/23/18 |
| Nitrate + Nitrite | 0.068 | mg/l | | 0.01 | SM4500NO3 | JC | 02/20/18 |

AMTEST Identification Number **18-A002729**
Client Identification **MONMS-20180212**
Sampling Date **02/12/18, 13:05**

Results

| PARAMETER | RESULT | UNITS | Q | D.L. | METHOD | ANALYST | DATE |
|--------------------------|--------|------------|---|------|-----------|---------|----------|
| Fecal Coliform | 2. | CFU/100 ml | | 1 | SM 9222D | NG | 02/13/18 |
| Total Nitrogen (NOX&TKN) | 1.09 | mg/l | | 0.1 | | | |
| Total Nitrogen (TKN) | 0.472 | mg/l | | 0.1 | SM4500N | JC | 02/23/18 |
| Nitrate + Nitrite | 0.62 | mg/l | | 0.01 | SM4500NO3 | JC | 02/20/18 |

AMTEST Identification Number **18-A002730**
Client Identification **MONM-20180212**
Sampling Date **02/12/18, 14:45**

Results

| PARAMETER | RESULT | UNITS | Q | D.L. | METHOD | ANALYST | DATE |
|--------------------------|--------|------------|---|------|-----------|---------|----------|
| Fecal Coliform | 2. | CFU/100 ml | | 1 | SM 9222D | NG | 02/13/18 |
| Total Nitrogen (NOX&TKN) | 0.76 | mg/l | | 0.1 | | | |
| Total Nitrogen (TKN) | 0.375 | mg/l | | 0.1 | SM4500N | JC | 02/23/18 |
| Nitrate + Nitrite | 0.38 | mg/l | | 0.01 | SM4500NO3 | JC | 02/20/18 |

AMTEST Identification Number **18-A002731**
Client Identification **SEIMN-20180212**
Sampling Date **02/12/18, 15:15**

Results

| PARAMETER | RESULT | UNITS | Q | D.L. | METHOD | ANALYST | DATE |
|--------------------------|--------|------------|---|------|-----------|---------|----------|
| Fecal Coliform | 2. | CFU/100 ml | | 1 | SM 9222D | NG | 02/13/18 |
| Total Nitrogen (NOX&TKN) | 0.57 | mg/l | | 0.1 | | | |
| Total Nitrogen (TKN) | 0.454 | mg/l | | 0.1 | SM4500N | JC | 02/23/18 |
| Nitrate + Nitrite | 0.12 | mg/l | | 0.01 | SM4500NO3 | JC | 02/20/18 |

AMTEST Identification Number **18-A002732**
Client Identification **SEIMS-20180212**
Sampling Date **02/12/18, 13:35**

Results

| PARAMETER | RESULT | UNITS | Q | D.L. | METHOD | ANALYST | DATE |
|--------------------------|--------|------------|---|------|-----------|---------|----------|
| Fecal Coliform | < 1 | CFU/100 ml | | 1 | SM 9222D | NG | 02/13/18 |
| Total Nitrogen (NOX&TKN) | 0.70 | mg/l | | 0.1 | | | |
| Total Nitrogen (TKN) | 0.530 | mg/l | | 0.1 | SM4500N | JC | 02/23/18 |
| Nitrate + Nitrite | 0.17 | mg/l | | 0.01 | SM4500NO3 | JC | 02/20/18 |

AMTEST Identification Number **18-A002733**
Client Identification **TOSMI-20180212**
Sampling Date **02/12/18, 10:20**

Results

| PARAMETER | RESULT | UNITS | Q | D.L. | METHOD | ANALYST | DATE |
|--------------------------|--------|------------|---|------|-----------|---------|----------|
| Fecal Coliform | 6. | CFU/100 ml | | 1 | SM 9222D | NG | 02/13/18 |
| Total Nitrogen (NOX&TKN) | 1.04 | mg/l | | 0.1 | | | |
| Total Nitrogen (TKN) | 0.395 | mg/l | | 0.1 | SM4500N | JC | 02/23/18 |
| Nitrate + Nitrite | 0.65 | mg/l | | 0.01 | SM4500NO3 | JC | 02/20/18 |

AMTEST Identification Number **18-A002734**
Client Identification **TOSMO-20180212**
Sampling Date **02/12/18, 09:55**

Results

| PARAMETER | RESULT | UNITS | Q | D.L. | METHOD | ANALYST | DATE |
|--------------------------|--------|------------|---|------|-----------|---------|----------|
| Fecal Coliform | 2. | CFU/100 ml | | 1 | SM 9222D | NG | 02/13/18 |
| Total Nitrogen (NOX&TKN) | 0.84 | mg/l | | 0.1 | | | |
| Total Nitrogen (TKN) | 0.302 | mg/l | | 0.1 | SM4500N | JC | 02/23/18 |
| Nitrate + Nitrite | 0.54 | mg/l | | 0.01 | SM4500NO3 | JC | 02/20/18 |

AMTEST Identification Number **18-A002735**
Client Identification **TYLMI-20180212**
Sampling Date **02/12/18, 11:50**

Results

| PARAMETER | RESULT | UNITS | Q | D.L. | METHOD | ANALYST | DATE |
|--------------------------|--------|------------|---|------|-----------|---------|----------|
| Fecal Coliform | 8. | CFU/100 ml | | 1 | SM 9222D | NG | 02/13/18 |
| Total Nitrogen (NOX&TKN) | 1.06 | mg/l | | 0.1 | | | |
| Total Nitrogen (TKN) | 0.454 | mg/l | | 0.1 | SM4500N | JC | 02/23/18 |
| Nitrate + Nitrite | 0.61 | mg/l | | 0.01 | SM4500NO3 | JC | 02/20/18 |

AMTEST Identification Number 18-A002736
Client Identification TYLMO-20180212
Sampling Date 02/12/18, 11:30


Results

| PARAMETER | RESULT | UNITS | Q | D.L. | METHOD | ANALYST | DATE |
|--------------------------|--------|------------|---|------|-----------|---------|----------|
| Fecal Coliform | 7. | CFU/100 ml | | 1 | SM 9222D | NG | 02/13/18 |
| Total Nitrogen (NOX&TKN) | 1.15 | mg/l | | 0.1 | | | |
| Total Nitrogen (TKN) | 0.510 | mg/l | | 0.1 | SM4500N | JC | 02/23/18 |
| Nitrate + Nitrite | 0.64 | mg/l | | 0.01 | SM4500NO3 | JC | 02/20/18 |

AMTEST Identification Number 18-A002737
Client Identification QA-45-20180212
Sampling Date 02/12/18, 12:00

Results

| PARAMETER | RESULT | UNITS | Q | D.L. | METHOD | ANALYST | DATE |
|--------------------------|--------|------------|---|------|-----------|---------|----------|
| Fecal Coliform | 12. | CFU/100 ml | | 1 | SM 9222D | NG | 02/13/18 |
| Total Nitrogen (NOX&TKN) | 0.94 | mg/l | | 0.1 | | | |
| Total Nitrogen (TKN) | 0.422 | mg/l | | 0.1 | SM4500N | JC | 02/23/18 |
| Nitrate + Nitrite | 0.52 | mg/l | | 0.01 | SM4500NO3 | JC | 02/20/18 |


Aaron W. Young
Laboratory Manager

QC Summary for sample numbers: 18-A002723 to 18-A002737

DUPLICATES

| SAMPLE # | ANALYTE | UNITS | SAMPLE VALUE | DUP VALUE | RPD |
|------------|----------------------|------------|--------------|-----------|------|
| 18-A002724 | Fecal Coliform | CFU/100 ml | 2. | 2. | 0.00 |
| 18-A002736 | Fecal Coliform | CFU/100 ml | 7. | 6. | 15. |
| 18-A002729 | Fecal Coliform | CFU/100 ml | 2. | 2. | 0.00 |
| 18-A002519 | Total Nitrogen (TKN) | mg/l | 0.417 | 0.405 | 2.9 |
| 18-A002548 | Total Nitrogen (TKN) | mg/l | 0.846 | 0.931 | 9.6 |
| 18-A002731 | Total Nitrogen (TKN) | mg/l | 0.454 | 0.416 | 8.7 |
| 18-A002864 | Total Nitrogen (TKN) | mg/l | 2.30 | 2.40 | 4.3 |
| 18-A002500 | Nitrate + Nitrite | mg/l | 0.51 | 0.45 | 12. |
| 18-A002723 | Nitrate + Nitrite | mg/l | 0.032 | 0.026 | 21. |
| 18-A002733 | Nitrate + Nitrite | mg/l | 0.65 | 0.74 | 13. |
| 18-A002772 | Nitrate + Nitrite | mg/l | 0.54 | 0.54 | 0.00 |

MATRIX SPIKES

| SAMPLE # | ANALYTE | UNITS | SAMPLE VALUE | SMPL+ SPK | SPK AMT | RECOVERY |
|------------|----------------------|-------|--------------|-----------|---------|----------|
| 18-A002519 | Total Nitrogen (TKN) | mg/l | 0.417 | 1.44 | 1.00 | 102.30 % |
| 18-A002548 | Total Nitrogen (TKN) | mg/l | 0.846 | 1.95 | 1.00 | 110.40 % |
| 18-A002731 | Total Nitrogen (TKN) | mg/l | 0.454 | 1.30 | 1.00 | 84.60 % |
| 18-A002864 | Total Nitrogen (TKN) | mg/l | 2.30 | 3.40 | 1.00 | 110.00 % |
| 18-A002500 | Nitrate + Nitrite | mg/l | 0.51 | 1.4 | 1.0 | 89.00 % |
| 18-A002723 | Nitrate + Nitrite | mg/l | 0.032 | 0.96 | 1.0 | 92.80 % |
| 18-A002733 | Nitrate + Nitrite | mg/l | 0.65 | 1.4 | 1.0 | 75.00 % |
| 18-A002772 | Nitrate + Nitrite | mg/l | 0.54 | 1.4 | 1.0 | 86.00 % |

STANDARD REFERENCE MATERIALS

| ANALYTE | UNITS | TRUE VALUE | MEASURED VALUE | RECOVERY |
|----------------------|-------|------------|----------------|----------|
| Total Nitrogen (TKN) | mg/l | 1.00 | 1.02 | 102. % |
| Total Nitrogen (TKN) | mg/l | 1.00 | 1.00 | 100. % |
| Nitrate + Nitrite | mg/l | 1.0 | 0.93 | 93.0 % |
| Nitrate + Nitrite | mg/l | 1.0 | 0.91 | 91.0 % |
| Nitrate + Nitrite | mg/l | 1.0 | 1.1 | 110. % |

BLANKS

| ANALYTE | UNITS | RESULT |
|----------------------|------------|--------|
| Fecal Coliform | CFU/100 ml | < 1 |
| Fecal Coliform | CFU/100 ml | < 1 |
| Fecal Coliform | CFU/100 ml | < 1 |
| Total Nitrogen (TKN) | mg/l | < 0.1 |
| Total Nitrogen (TKN) | mg/l | < 0.1 |

QC Summary for sample numbers: 18-A002723 to 18-A002737...

BLANKS continued....

| ANALYTE | UNITS | RESULT |
|-------------------|-------|--------|
| Nitrate + Nitrite | mg/l | < 0.01 |
| Nitrate + Nitrite | mg/l | < 0.01 |
| Nitrate + Nitrite | mg/l | < 0.01 |



14648 NE 95th Street, Redmond, WA 98052 · (425) 883-3881

Laboratory: AmTest Laboratories

Attention: Aaron Young

13600 NE 126th PI Kirkland, WA 98034

Phone Number: (425) 885-1664

Turnaround Request

1 Day 2 Day 3 Day

Standard

Other: _____

Laboratory Reference #: 02-126

Project Manager: Blair Goodrow

email: bgoodrow@onsite-env.com

Project Number: 14-05806-000

Project Name: Redmond Paired Watershed Study

| Lab ID | Sample Identification | Date Sampled | Time Sampled | Matrix | # of Cont. | Requested Analyses |
|-------------------------------------|---------------------------|---------------|--------------|----------------|------------|--|
| 1 | COLM-20180212 <i>2723</i> | 2/12/18 | 1600 | Water | 2 | Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N |
| 2 | COUMI-20180212 <i>24</i> | 2/12/18 | 0920 | Water | 2 | Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N |
| 3 | COUMC-20180212 <i>25</i> | 2/12/18 | 0940 | Water | 2 | Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N |
| 4 | EVAMS-20180212 <i>26</i> | 2/12/18 | 1045 | Water | 2 | Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N |
| 5 | EVALSS-20180212 <i>27</i> | 2/12/18 | 1105 | Water | 2 | Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N |
| 6 | MONMN-20180212 <i>28</i> | 2/12/18 | 1245 | Water | 2 | Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N |
| 7 | MONMS-20180212 <i>29</i> | 2/12/18 | 1305 | Water | 2 | Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N |
| 8 | MONM-20180212 <i>30</i> | 2/12/18 | 1445 | Water | 2 | Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N |
| 9 | SEIMN-20180212 <i>31</i> | 2/12/18 | 1515 | Water | 2 | Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N |
| 10 | SEIMS-20180212 <i>32</i> | 2/12/18 | 1335 | Water | 2 | Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N |
| Signature | | Company | | Date | Time | Comments/Special Instructions |
| Relinquished by: <i>[Signature]</i> | | <i>OSE</i> | | <i>2/13/18</i> | <i>905</i> | EDDs - CSV Reporting Limits: Fecal Coliform - 1.0 cfu/100ml Total Nitrogen - .10 mg/L |
| Received by: <i>[Signature]</i> | | <i>Amtest</i> | | <i>2/13/18</i> | <i>905</i> | |
| Relinquished by: | | | | | | |
| Received by: | | | | | | |
| Relinquished by: | | | | | | |
| Received by: | | | | | | |

*Amtest id: 2729 - missing fecal coliform (EDTA)
 Onsite id: MONMS bottles. Called client 2/13/18 @ 9:30 AM. temp = 3.8 °C
 - 20180212 received sample 2/13/18 @ 12:30 PM*



14648 NE 95th Street, Redmond, WA 98052
 Telephone: 425.883.3881

Company: Herrera Environmental Consultants

Project No.: 14-05806-000

Project Name: Redmond Paired Watershed Study

Project Manager: George Iftner

CHAIN OF CUSTODY

Turnaround Requested:

- 1 Day
- 2 Day
- 3 Day
- Standard

Laboratory No.

02-126

Requested Analyses

| Total Suspended Solids (SM 2540D) | Turbidity (EPA 181.1) | Hardness (EPA 200.7 / SM 2340B) | Dissolved Organ Carbon (SM 5310B) * | Fecal Coliform (SM 9222D) | Total Phosphorus (EPA 365.1) | Total Nitrogen (SM 4500 N-B) | Total Cu and Zn (EPA 200.8) | Dissolved Cu and Zn (EPA 200.8) * | | | | | | | |
|-----------------------------------|-----------------------|---------------------------------|-------------------------------------|---------------------------|------------------------------|------------------------------|-----------------------------|-----------------------------------|--|--|--|--|--|--|--|
|-----------------------------------|-----------------------|---------------------------------|-------------------------------------|---------------------------|------------------------------|------------------------------|-----------------------------|-----------------------------------|--|--|--|--|--|--|--|

| Lab ID | Sample Identification | Date Sampled | Time Sampled | Matrix | # of Cont. | Total Suspended Solids (SM 2540D) | Turbidity (EPA 181.1) | Hardness (EPA 200.7 / SM 2340B) | Dissolved Organ Carbon (SM 5310B) * | Fecal Coliform (SM 9222D) | Total Phosphorus (EPA 365.1) | Total Nitrogen (SM 4500 N-B) | Total Cu and Zn (EPA 200.8) | Dissolved Cu and Zn (EPA 200.8) * | | | | | | | |
|--------|-----------------------|--------------|--------------|--------|------------|-----------------------------------|-----------------------|---------------------------------|-------------------------------------|---------------------------|------------------------------|------------------------------|-----------------------------|-----------------------------------|---|--|--|--|--|--|--|
| 1 | COLM-2018 0212 | 2.12.18 | 16:00 | Water | 7 | X | X | X | X | X | X | X | X | X | | | | | | | |
| 2 | COUMI-2018 0212 | ↓ | 9:20 | Water | 7 | X | X | X | X | X | X | X | X | X | | | | | | | |
| 3 | COUMO-2018 0212 | | 9:40 | Water | 7 | X | X | X | X | X | X | X | X | X | X | | | | | | |
| 4 | EVAMS-2018 0212 | | 10:45 | Water | 7 | X | X | X | X | X | X | X | X | X | X | | | | | | |
| 5 | EVALSS-2018 0212 | | 11:05 | Water | 7 | X | X | X | X | X | X | X | X | X | X | | | | | | |
| 6 | MONMN-2018 0212 | | 12:45 | Water | 7 | X | X | X | X | X | X | X | X | X | X | | | | | | |
| 7 | MONMS-2018 0212 | | 13:05 | Water | 7 | X | X | X | X | X | X | X | X | X | X | | | | | | |
| 8 | MONM-2018 0212 | | 14:45 | Water | 7 | X | X | X | X | X | X | X | X | X | X | | | | | | |
| 9 | SEIMN-2018 0212 | | 15:15 | Water | 7 | X | X | X | X | X | X | X | X | X | X | | | | | | |
| 10 | SEIMS-2018 0212 | | 13:35 | Water | 7 | X | X | X | X | X | X | X | X | X | X | | | | | | |
| 11 | TOSMI-2018 0212 | | 10:20 | Water | 7 | X | X | X | X | X | X | X | X | X | X | | | | | | |
| 12 | TOSMO-2018 0212 | | 9:55 | Water | 7 | X | X | X | X | X | X | X | X | X | X | | | | | | |
| 13 | TYLMI-2018 0212 | | 11:50 | Water | 7 | X | X | X | X | X | X | X | X | X | X | | | | | | |
| 14 | TYLMO-2018 0212 | | 11:30 | Water | 7 | X | X | X | X | X | X | X | X | X | X | | | | | | |
| 15 | QA 45-2018 0212 | | 12:00 | Water | 7 | X | X | X | X | X | X | X | X | X | X | | | | | | |

Relinquished by [Signature] Date 2/12/18 Received by [Signature] Date 2/12/18
 Firm Herrera Time 16:34 Firm OSE Time 1634

Relinquished by _____ Date _____ Received by _____ Date _____
 Firm _____ Time _____ Firm _____ Time _____

Comments:
 * - field filtered with 0.45 µm filter within 15 minutes of collecting sample

**InSite
Environmental Inc.**

14648 NE 95th Street, Redmond, WA 98052
Telephone: 425.883.3881

Company: Herrera Environmental Consultants
Project No.: 14-05806-000
Project Name: Redmond Paired Watershed Study
Project Manager: George Ifiner

CHAIN OF CUSTODY

Turnaround Requested:
____ 1 Day
____ 2 Day
____ 3 Day
 Standard

| | | | | | | | | | | |
|-----------------------------------|-----------------------|---------------------------------|-------------------------------------|---------------------------|------------------------------|------------------------------|-----------------------------|-----------------------------------|--|--|
| Laboratory No. | | | | | | | | | | |
| Requested Analyses | | | | | | | | | | |
| Total Suspended Solids (SM 2540D) | Turbidity (EPA 181.1) | Hardness (EPA 200.7 / SM 2340B) | Dissolved Organ Carbon (SM 5310B) * | Fecal Coliform (SM 9222D) | Total Phosphorus (EPA 365.1) | Total Nitrogen (SM 4500 N-B) | Total Cu and Zn (EPA 200.8) | Dissolved Cu and Zn (EPA 200.8) * | | |

| Lab ID | Sample Identification | Date Sampled | Time Sampled | Matrix | # of Cont. | Total Suspended Solids (SM 2540D) | Turbidity (EPA 181.1) | Hardness (EPA 200.7 / SM 2340B) | Dissolved Organ Carbon (SM 5310B) * | Fecal Coliform (SM 9222D) | Total Phosphorus (EPA 365.1) | Total Nitrogen (SM 4500 N-B) | Total Cu and Zn (EPA 200.8) | Dissolved Cu and Zn (EPA 200.8) * | | |
|--------|-----------------------|--------------|--------------|--------|------------|-----------------------------------|-----------------------|---------------------------------|-------------------------------------|---------------------------|------------------------------|------------------------------|-----------------------------|-----------------------------------|--|--|
| 1 | COLM-2018 0212 | 2-12-18 | 10:00 | Water | 7 | X | X | X | X | X | X | X | X | X | | |
| 2 | COUMI-2018 0212 | ↓ | 9:20 | Water | 7 | X | X | X | X | X | X | X | X | X | | |
| 3 | COUMO-2018 0212 | | 9:40 | Water | 7 | X | X | X | X | X | X | X | X | X | | |
| 4 | EVAMS-2018 0212 | | 10:45 | Water | 7 | X | X | X | X | X | X | X | X | X | | |
| 5 | EVALSS-2018 0212 | | 11:05 | Water | 7 | X | X | X | X | X | X | X | X | X | | |
| 6 | MONMN-2018 0212 | | 12:45 | Water | 7 | X | X | X | X | X | X | X | X | X | | |
| 7 | MONMS-2018 0212 | | 13:05 | Water | 7 | X | X | X | X | X | X | X | X | X | | |
| 8 | MONM-2018 0212 | | 14:45 | Water | 7 | X | X | X | X | X | X | X | X | X | | |
| 9 | SEIMN-2018 0212 | | 15:15 | Water | 7 | X | X | X | X | X | X | X | X | X | | |
| 10 | SEIMS-2018 0212 | | 13:35 | Water | 7 | X | X | X | X | X | X | X | X | X | | |
| 11 | TOSMI-2018 0212 | | 10:20 | Water | 7 | X | X | X | X | X | X | X | X | X | | |
| 12 | TOSMO-2018 0212 | | 9:55 | Water | 7 | X | X | X | X | X | X | X | X | X | | |
| 13 | TYLMI-2018 0212 | | 11:50 | Water | 7 | X | X | X | X | X | X | X | X | X | | |
| 14 | TYLMO-2018 0212 | | 11:30 | Water | 7 | X | X | X | X | X | X | X | X | X | | |
| 15 | QA 45-2018 0212 | | 12:00 | Water | 7 | X | X | X | X | X | X | X | X | X | | |

Relinquished by [Signature] Date 2/12/18 Received by [Signature] Date 2/12/18
 Firm Herrera Time 16:34 Firm [Signature] Time 16:34
 Relinquished by _____ Date _____ Received by _____ Date _____
 Firm _____ Time _____ Firm _____ Time _____

Comments:
* - field filtered with 0.45 µm filter within 15 minutes of collecting sample

METER CALIBRATION LOG - Redmond Paired Watershed Study



| | | | |
|-----------------------------------|------------------|-------|-------|
| Project Number: | 14-05806-000 | | |
| Personnel Performing Calibration: | M Mulken | | |
| Meter: | Pro DSS #2 | | |
| Date/Time: | 2.12.18 / 8:00 | | |
| Barometric Pressure Start of Day: | Inches Hg: 306.6 | Time: | 8:00 |
| Barometric Pressure End of Day: | Inches Hg: 307.3 | Time: | 17:20 |

| |
|---|
| Calibration Procedures: |
| Rinse Multimeter Sonde Between Each Operation |
| Rinse 3 times with tap water, 3 times with deionized water, then 3 times with the solution to be used for calibrating or testing. |
| Conductivity Calibration Notes: |

| PRE Field Run CALIBRATION | Meter Reading | Buffer / Cal Std | Temp °C | Comments |
|---------------------------|---------------|------------------|---------|------------------|
| Conductivity (µS/cm) | 8.5 | 0 | 21.0 | Herrera DI water |
| Conductivity (µS/cm) | 1000 | 1,000 | 21.0 | |
| Conductivity (µS/cm) | 100.7 | 100 | 20.8 | |
| DO % Saturation | 100.9 | 100 | 20.2 | |

1. Dry the conductivity probe with a lab tissue (e.g., KimWipes®) and DI water.
2. Fill calibration cup to within a centimeter of the top of the calibration cup with DI water (0 µS).
3. Fill the calibration cup with 1,000 µS standard so that the temperature/conductivity probe is submerged.
4. Make sure there are no bubbles in the cell; wait 2 minutes.
5. Enter the appropriate standard value (1,000 µS/cm or 1.0 mS/cm) for Sp Cond.
6. Check conductivity using 100 µS/cm standard.

| POST Field Run CHECK | Meter Reading | Buffer / Cal Std | Temp °C | Comments |
|----------------------|---------------|------------------|---------|------------------|
| Conductivity (µS/cm) | 8.5 | 0 | 21.2 | Herrera DI water |
| Conductivity (µS/cm) | 100.5 | 100 | 21.9 | |
| DO % Saturation | 100.9 | 100 | 20.7 | |

- Dissolved Oxygen Calibration Notes:**
1. Fill the calibration cup with about 1/2 inch of DI; it should be below the sensor cap.
 2. Use KimWipes® to dry any droplets from the sensor cap.
 3. Invert calibration cup's cap and gently rest it on the cup.
 4. Wait 5 minutes, making sure that temperature stabilizes.
 5. Determine local barometric pressure (mm Hg) and enter this value into the meter.
 6. Click "Calibrate". "Calibrate Successful" will be displayed.
 7. To retain calibration accuracy between measurements, store with the sensor immersed in water or within a water-saturated air environment such as a sealed storage cup with at least 10 ml of water.
 8. It is important to have the water-saturated air and the sensor at the same temperature. Therefore, store a jar of DI in the same environment as the sonde and calibrate in a similar air temperature as the water and sonde.
 9. Keep probe out of direct sun or wind.

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: MM + VW

Sample Date: 2.12.18

Sample Time: 10:00

PDT:

SITE ID: COLM

Base Flow or Storm Event?

Field Filtered Time: 10:05

PST:

Project Number: 14-05806-000

(Must filter within 15 minutes of collection)



HERRERA

Project Name: Redmond Paired Watershed Study

Current Weather and Temp: 39°F sunny

Water Quality Sampling

Sample ID: COLM-20180212

| Parameter | Bottle Type | Bottle Volume | # Bottles | Preservative | Duplicated? |
|---------------------------|-------------|---------------|-----------|--------------------------------|-------------|
| TSS and Turbidity | HDPE | 1L | 1 | NA | <u>NO</u> |
| DOC * | HDPE | 250 ml | 1 | HCL | ↓ |
| Fecal Col. Bact. | HDPE | 250 ml | 1 | EDTA | |
| T. Phosphorous | HDPE | 250 ml | 1 | H ₂ SO ₄ | |
| T. Nitrogen | HDPE | 250 ml | 1 | H ₂ SO ₄ | |
| Diss. Cu and Zn * | HDPE | 250 ml | 1 | HNO ₃ | |
| Hardness, Total Cu and Zn | HDPE | 500 ml | 1 | HNO ₃ | ↓ |

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID: NA

Filter blank sample ID: NA

Transfer blank sample ID:

Visual and Olfactory Conditions:

Clarity: clear

Color: tannin

Odor: none

Sheen: none

Floatables: lots of foam

LABORATORY DELIVERY

Date:

Time:

Quality Assurance

Checked By: T. Louth

Signature:

Date Checked: 3-22-18

Time:

Data Entered into Database?

YES NO initials:

Date Entered:

Time:

Notes:

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

YSI Pro Plus (15D100020)

YSI Pro DSS 1

YSI Pro DSS 2

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): 5.70

Reference Point (description): SG

Water Quality Measurements

Temperature (°C) 4.7

Specific Conductivity (µs/cm) 26.6

Dissolved Oxygen (mg/L) 12.04

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: MM + JW
 Sample Date: 2/12/2018 Sample Time: 9:20 PDT
 Base Flow or Storm Event? Field Filtered Time: 9:20 PST
(Must filter within 15 minutes of collection)

SITE ID: COUM1
 Project Number: 14-05806-000



Project Name: Redmond Paired Watershed Study
 Current Weather and Temp: 28°F + Sunny

Water Quality Sampling

Sample ID: COUM1 2018 0212

| Parameter | Bottle Type | Bottle Volume | # Bottles | Preservative | Duplicated? |
|---------------------------|-------------|---------------|-----------|--------------------------------|-------------|
| TSS and Turbidity | HDPE | 1L | 1 | NA | NO ↓ |
| DOC * | HDPE | 250 ml | 1 | HCL | |
| Fecal Col. Bact. | HDPE | 250 ml | 1 | EDTA | |
| T. Phosphorous | HDPE | 250 ml | 1 | H ₂ SO ₄ | |
| T. Nitrogen | HDPE | 250 ml | 1 | H ₂ SO ₄ | |
| Diss. Cu and Zn * | HDPE | 250 ml | 1 | HNO ₃ | |
| Hardness, Total Cu and Zn | HDPE | 500 ml | 1 | HNO ₃ | |

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID: NA
 Filter blank sample ID: —
 Transfer blank sample ID: —

Visual and Olfactory Conditions:

Clarity: Good clear
 Color: none
 Odor: none
 Sheen: none
 Floatables: none

LABORATORY DELIVERY

Date: _____ Time: _____

Quality Assurance

Checked By: J. Leuth Signature: [Signature]
 Date Checked: 3-22-18 Time: _____
 Data Entered into Database? YES NO initials: _____
 Date Entered: _____ Time: _____
 Notes: _____

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

YSI Pro Plus (15D100020) _____
 YSI Pro DSS 1 _____
 YSI Pro DSS 2

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): 2.08
 Reference Point (description): SL

Water Quality Measurements

Temperature (°C) 4.9
 Specific Conductivity (µs/cm) 259.0
 Dissolved Oxygen (mg/L) 0.3 12.88

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: MM + VN

Sample Date: 2.12.18

Sample Time: 9:40

PDT:

SITE

ID: COUM0

Base Flow or Storm Event?

Field Filtered Time: 9:45

PST:

Project Number: 14-05806-000

(Must filter within 15 minutes of collection)



HERRERA

Project Name: Redmond Paired Watershed Study

Current Weather and Temp: 78°F Sunny

Water Quality Sampling

Sample ID: COUM0-20180201

| Parameter | Bottle Type | Bottle Volume | # Bottles | Preservative | Duplicated? |
|---------------------------|-------------|---------------|-----------|--------------------------------|-------------|
| TSS and Turbidity | HDPE | 1L | 1 | NA | <u>NO</u> |
| DOC * | HDPE | 250 ml | 1 | HCL | ↓ |
| Fecal Col. Bact. | HDPE | 250 ml | 1 | EDTA | |
| T. Phosphorous | HDPE | 250 ml | 1 | H ₂ SO ₄ | |
| T. Nitrogen | HDPE | 250 ml | 1 | H ₂ SO ₄ | |
| Diss. Cu and Zn * | HDPE | 250 ml | 1 | HNO ₃ | |
| Hardness, Total Cu and Zn | HDPE | 500 ml | 1 | HNO ₃ | |

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID: NA

Filter blank sample ID: _____

Transfer blank sample ID: _____

Visual and Olfactory Conditions:

Clarity: clear
 Color: none
 Odor: none
 Sheen: none
 Floatables: none

LABORATORY DELIVERY

Date: _____

Time: _____

Quality Assurance

Checked By: J. Lenth

Signature: [Signature]

Date Checked: 3.22.18

Time: _____

Data Entered into Database?

YES

NO

initials: _____

Date Entered: _____

Time: _____

Notes: _____

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

YSI Pro Plus (15D100020) _____

YSI Pro DSS 1 _____

YSI Pro DSS 2

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): 1.30

Reference Point (description): SG

Water Quality Measurements

Temperature (°C) 5.3°C

Specific Conductivity (µs/cm) 241.8

Dissolved Oxygen (mg/L) 12.59

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: MM + VW
 Sample Date: 2.12.18 Sample Time: 10:45 PDT:
 Basic Flow or Storm Event? Field Filtered Time: 10:56 PST:
 (Must filter within 15 minutes of collection)

SITE ID: EVAMS
 Project Number: 14-05806-000



Project Name: Redmond Paired Watershed Study
 Current Weather and Temp: 31°F sunny

Water Quality Sampling

Sample ID: EVAMS-20180212

| Parameter | Bottle Type | Bottle Volume | # Bottles | Preservative | Duplicated? |
|---------------------------|-------------|---------------|-----------|--------------------------------|-------------|
| TSS and Turbidity | HDPE | 1L | 1 | NA | NO |
| DOC * | HDPE | 250 ml | 1 | HCL | ↓ |
| Fecal Col. Bact. | HDPE | 250 ml | 1 | EDTA | |
| T. Phosphorous | HDPE | 250 ml | 1 | H ₂ SO ₄ | |
| T. Nitrogen | HDPE | 250 ml | 1 | H ₂ SO ₄ | |
| Diss. Cu and Zn * | HDPE | 250 ml | 1 | HNO ₃ | |
| Hardness, Total Cu and Zn | HDPE | 500 ml | 1 | HNO ₃ | |

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID: NA
 Filter blank sample ID: _____
 Transfer blank sample ID: _____

Visual and Olfactory Conditions:

Clarity: clear
 Color: none
 Odor: none
 Sheen: none
 Floatables: none

LABORATORY DELIVERY

Date: _____ Time: _____

Quality Assurance

Checked By: S. Leuth Signature: [Signature]
 Date Checked: 3-22-18 Time: _____
 Data Entered into Database? YES NO initials: _____
 Date Entered: _____ Time: _____
 Notes: _____

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

YSI Pro Plus (15D100020) _____
 YSI Pro DSS 1 _____
 YSI Pro DSS 2

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): 3.99
 Reference Point (description): SL

Water Quality Measurements

Temperature (°C) 5.1
 Specific Conductivity (µs/cm) 183.3
 Dissolved Oxygen (mg/L) 12.56

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: MM + VW

Sample Date: 2.12.18

Sample Time: 11:05

PDT:

SITE

ID: EVALSS

Base Flow or Storm Event? Flow

Field Filtered Time: 11:16

PST:

Project Number: 14-05806-000

(Must filter within 15 minutes of collection)

Project Name: Redmond Paired Watershed Study



HERRERA

Current Weather and Temp: 31°F Sunny

Water Quality Sampling

Sample ID: EVALSS-20180212

| Parameter | Bottle Type | Bottle Volume | # Bottles | Preservative | Duplicated? |
|---------------------------|-------------|---------------|-----------|--------------------------------|-------------|
| TSS and Turbidity | HDPE | 1L | 1 | NA | <u>No</u> |
| DOC * | HDPE | 250 ml | 1 | HCL | ↓ |
| Fecal Col. Bact. | HDPE | 250 ml | 1 | EDTA | |
| T. Phosphorous | HDPE | 250 ml | 1 | H ₂ SO ₄ | |
| T. Nitrogen | HDPE | 250 ml | 1 | H ₂ SO ₄ | |
| Diss. Cu and Zn * | HDPE | 250 ml | 1 | HNO ₃ | |
| Hardness, Total Cu and Zn | HDPE | 500 ml | 1 | HNO ₃ | |

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID: NA

Filter blank sample ID:

Transfer blank sample ID:

Visual and Olfactory Conditions:

Clarity: clear

Color: none

Odor: none

Sheen: none

Floatables: some foam

LABORATORY DELIVERY

Date: _____ Time: _____

Quality Assurance

Checked By: J. Lenth

Signature:

Date Checked: 3-22-18

Time: _____

Data Entered into Database? YES NO initials:

Date Entered: _____ Time: _____

Notes:

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

YSI Pro Plus (15D100020) _____

YSI Pro DSS 1 _____

YSI Pro DSS 2 _____

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): 2.32

Reference Point (description): SG

Water Quality Measurements

Temperature (°C) 4.7

Specific Conductivity (µs/cm) 172.6

Dissolved Oxygen (mg/L) 12.96

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: **MM+VW**

Sample Date: **2.12.19**

Sample Time: **12:45**

PDT:

SITE ID: **MONMN**

Baseflow or Storm Event? Storm

Field Filtered Time: **12:50**

PST:

Project Number: **14-05806-000**

(Must filter within 15 minutes of collection)

Project Name: **Redmond Paired Watershed Study**



HERRERA

Current Weather and Temp: **39°F sunny**

Water Quality Sampling

Sample ID: **MONMN-20190212**

| Parameter | Bottle Type | Bottle Volume | # Bottles | Preservative | Duplicated? |
|---------------------------|-------------|---------------|-----------|--------------------------------|-------------|
| TSS and Turbidity | HDPE | 1L | 1 | NA | No |
| DOC * | HDPE | 250 ml | 1 | HCL | ↓ |
| Fecal Col. Bact. | HDPE | 250 ml | 1 | EDTA | |
| T. Phosphorous | HDPE | 250 ml | 1 | H ₂ SO ₄ | |
| T. Nitrogen | HDPE | 250 ml | 1 | H ₂ SO ₄ | |
| Diss. Cu and Zn * | HDPE | 250 ml | 1 | HNO ₃ | |
| Hardness, Total Cu and Zn | HDPE | 500 ml | 1 | HNO ₃ | |

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID: **NA**
 Filter blank sample ID:
 Transfer blank sample ID:


Visual and Olfactory Conditions:

Clarity: **clear**
 Color: **none**
 Odor: **none**
 Sheen: **none**
 Floatables: **none**

LABORATORY DELIVERY

Date: _____ Time: _____

Quality Assurance

Checked By: **S. Lenth** Signature: 
 Date Checked: **3-22-19** Time: _____
 Data Entered into Database? YES NO initials:
 Date Entered: _____ Time: _____
 Notes: _____

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

YSI Pro Plus (15D100020) _____
 YSI Pro DSS 1 _____
 YSI Pro DSS 2 _____

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): **9.10**
 Reference Point (description): **SG**

Water Quality Measurements

Temperature (°C) **5.5**
 Specific Conductivity (µs/cm) **139.4**
 Dissolved Oxygen (mg/L) **12.31**

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: **MM + VW**

Sample Date: **2-12-18**

Sample Time: **13:05**

PDT:

SITE ID: **MONMS**

Base Flow or Storm Event?

Field Filtered Time: **13:10**

PST:

Project Number: 14-05806-000

(Must filter within 15 minutes of collection)



Water Quality Sampling

Sample ID: **MONMS-20160212**

Project Name: Redmond Paired Watershed Study

Current Weather and Temp: **39° F sunny**

| Parameter | Bottle Type | Bottle Volume | # Bottles | Preservative | Duplicated? |
|---------------------------|-------------|---------------|-----------|--------------------------------|-------------|
| TSS and Turbidity | HDPE | 1L | 1 | NA | NO |
| DOC * | HDPE | 250 ml | 1 | HCL | |
| Fecal Col. Bact. | HDPE | 250 ml | 1 | EDTA | |
| T. Phosphorous | HDPE | 250 ml | 1 | H ₂ SO ₄ | |
| T. Nitrogen | HDPE | 250 ml | 1 | H ₂ SO ₄ | |
| Diss. Cu and Zn * | HDPE | 250 ml | 1 | HNO ₃ | |
| Hardness, Total Cu and Zn | HDPE | 500 ml | 1 | HNO ₃ | |

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

- YSI Pro Plus (15D100020) _____
- YSI Pro DSS 1 _____
- YSI Pro DSS 2 _____

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): **69.76**

Reference Point (description): **top of PVC pipe down**

Water Quality Measurements

- Temperature (°C) **6.3**
- Specific Conductivity (µs/cm) **283.3**
- Dissolved Oxygen (mg/L) **10.56**

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID: **NA**
 Filter blank sample ID: _____
 Transfer blank sample ID: _____

Visual and Olfactory Conditions:

Clarity: **clear**
 Color: **none**
 Odor: **faint bio odor**
 Sheen: **none**
 Floatables: **none**

LABORATORY DELIVERY

Date: _____ Time: _____

Quality Assurance

Checked By: **J. Lenth** Signature: *[Signature]*
 Date Checked: **3-22-18** Time: _____
 Data Entered into Database? YES NO initials:
 Date Entered: _____ Time: _____
 Notes: _____

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: MM + VW

Sample Date: 2.12.16

Sample Time: 14:45

PDT:

SITE ID: MONM

Baseflow or Storm Event?

Field Filtered Time: 14:50

PST:

Project Number: 14-05806-000

(Must filter within 15 minutes of collection)



HERRERA

Project Name: Redmond Paired Watershed Study

Current Weather and Temp: 39°F sunny

Water Quality Sampling

Sample ID: MONM-20160212

| Parameter | Bottle Type | Bottle Volume | # Bottles | Preservative | Duplicated? |
|---------------------------|-------------|---------------|-----------|--------------------------------|-------------|
| TSS and Turbidity | HDPE | 1L | 1 | NA | <u>NO</u> |
| DOC * | HDPE | 250 ml | 1 | HCL | |
| Fecal Col. Bact. | HDPE | 250 ml | 1 | EDTA | |
| T. Phosphorous | HDPE | 250 ml | 1 | H ₂ SO ₄ | |
| T. Nitrogen | HDPE | 250 ml | 1 | H ₂ SO ₄ | |
| Diss. Cu and Zn * | HDPE | 250 ml | 1 | HNO ₃ | |
| Hardness, Total Cu and Zn | HDPE | 500 ml | 1 | HNO ₃ | |

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID: NA

Filter blank sample ID: NA

Transfer blank sample ID: NA

Visual and Olfactory Conditions:

Clarity: clear
 Color: none
 Odor: none
 Sheen: none
 Floatables: none

LABORATORY DELIVERY

Date: _____ Time: _____

Quality Assurance

Checked By: J. Lenth

Signature: 

Date Checked: 3-22-18 Time: _____

Data Entered into Database? YES NO initials: _____

Date Entered: _____ Time: _____

Notes: _____

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

YSI Pro Plus (15D100020) _____

YSI Pro DSS 1 _____

YSI Pro DSS 2

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): NA

Reference Point (description): NA

Water Quality Measurements

Temperature (°C) 6.3

Specific Conductivity (µs/cm) 187.4

Dissolved Oxygen (mg/L) 12.41

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: MM + VW

Sample Date: 2.12.18

Sample Time: 15:15

PDT:

SITE ID: SEIMN

Base Flow or Storm Event? ⊗

Field Filtered Time: 15:20

PST: X

Project Number: 14-05806-000

(Must filter within 15 minutes of collection)



HERRERA

Project Name: Redmond Paired Watershed Study

Current Weather and Temp: 39°F sunny

Water Quality Sampling

Sample ID: SEIMN-20180212

| Parameter | Bottle Type | Bottle Volume | # Bottles | Preservative | Duplicated? |
|---------------------------|-------------|---------------|-----------|--------------------------------|-------------|
| TSS and Turbidity | HDPE | 1L | 1 | NA | <u>NO</u> |
| DOC * | HDPE | 250 ml | 1 | HCL | ↓ |
| Fecal Col. Bact. | HDPE | 250 ml | 1 | EDTA | |
| T. Phosphorous | HDPE | 250 ml | 1 | H ₂ SO ₄ | |
| T. Nitrogen | HDPE | 250 ml | 1 | H ₂ SO ₄ | |
| Diss. Cu and Zn * | HDPE | 250 ml | 1 | HNO ₃ | |
| Hardness, Total Cu and Zn | HDPE | 500 ml | 1 | HNO ₃ | ↓ |

* - field filtered with Nalgene 250 ml SFCA 0.45 μm filter and vacuum hand pump

Duplicate sample ID: NA

Filter blank sample ID: _____

Transfer blank sample ID: _____

Visual and Olfactory Conditions:

Clarity: clear
 Color: tannin
 Odor: none
 Sheen: none
 Floatables: FOAM

LABORATORY DELIVERY

Date: _____ Time: _____

Quality Assurance

Checked By: S. Lenth

Signature: [Signature]

Date Checked: 3-22-18 Time: _____

Data Entered into Database? YES / NO _____ initials: _____

Date Entered: _____ Time: _____

Notes: _____

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

YSI Pro Plus (15D100020) _____

YSI Pro DSS 1 _____

YSI Pro DSS 2 ✓

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): 0.62

Reference Point (description): top of bolt

Water Quality Measurements

Temperature (°C) 5.2°

Specific Conductivity (μs/cm) 53.8

Dissolved Oxygen (mg/L) 12.64

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: MM & VW

Sample Date: 2.12.18

Sample Time: 13:35

PDT:

SITE ID: SEIMS

Base Flow or Storm Event?

Field Filtered Time: 13:40

PST:

Project Number: 14-05806-000

(Must filter within 15 minutes of collection)



HERRERA

Project Name: Redmond Paired Watershed Study

Current Weather and Temp:

40°F Sunny

Water Quality Sampling

Sample ID: SEIMS-20180212

| Parameter | Bottle Type | Bottle Volume | # Bottles | Preservative | Duplicated? |
|---------------------------|-------------|---------------|-----------|--------------------------------|-------------|
| TSS and Turbidity | HDPE | 1L | 1 | NA | <u>NO</u> |
| DOC * | HDPE | 250 ml | 1 | HCL | ↓ |
| Fecal Col. Bact. | HDPE | 250 ml | 1 | EDTA | |
| T. Phosphorous | HDPE | 250 ml | 1 | H ₂ SO ₄ | |
| T. Nitrogen | HDPE | 250 ml | 1 | H ₂ SO ₄ | |
| Diss. Cu and Zn * | HDPE | 250 ml | 1 | HNO ₃ | |
| Hardness, Total Cu and Zn | HDPE | 500 ml | 1 | HNO ₃ | |

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID: NA

Filter blank sample ID:

Transfer blank sample ID:

Visual and Olfactory Conditions:

Clarity: clear
 Color: none
 Odor: none
 Sheen: none
 Floatables: FOAM

LABORATORY DELIVERY

Date: _____ Time: _____

Quality Assurance

Checked By: J. Lenth

Signature:

Date Checked: 3-22-18

Time:

Data Entered into Database? YES NO initials:

Date Entered: _____ Time: _____

Notes:

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

YSI Pro Plus (15D100020) _____

YSI Pro DSS 1 _____

YSI Pro DSS 2

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): 0.80

Reference Point (description): SL

Water Quality Measurements

Temperature (°C) 5.2

Specific Conductivity (µs/cm) 92.2

Dissolved Oxygen (mg/L) 12.24

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: MM + VW

Sample Date: 2-22-18

Sample Time: 10:20

PDT:

SITE ID:

TOSM1

Base Flow or Storm Event?

Field Filtered Time: 10:15

PST: λ

(Must filter within 15 minutes of collection)

Project Number: 14-05806-000



HERRERA

Project Name: Redmond Paired Watershed Study

Water Quality Sampling

Sample ID: TOSM1-20180212

Current Weather and Temp: 31° F Sunny

| Parameter | Bottle Type | Bottle Volume | # Bottles | Preservative | Duplicated? |
|---------------------------|-------------|---------------|-----------|--------------------------------|-------------|
| TSS and Turbidity | HDPE | 1L | 1 | NA | <u>NO</u> |
| DOC * | HDPE | 250 ml | 1 | HCL | ↓ |
| Fecal Col. Bact. | HDPE | 250 ml | 1 | EDTA | |
| T. Phosphorous | HDPE | 250 ml | 1 | H ₂ SO ₄ | |
| T. Nitrogen | HDPE | 250 ml | 1 | H ₂ SO ₄ | |
| Diss. Cu and Zn * | HDPE | 250 ml | 1 | HNO ₃ | |
| Hardness, Total Cu and Zn | HDPE | 500 ml | 1 | HNO ₃ | |

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID: NA
 Filter blank sample ID: /
 Transfer blank sample ID: /

Visual and Olfactory Conditions:

Clarity: clear
 Color: none
 Odor: none
 Sheen: none
 Floatables: none

LABORATORY DELIVERY

Date: _____ Time: _____

Quality Assurance

Checked By: J. Lenth Signature: [Signature]
 Date Checked: 2-22-18 Time: _____
 Data Entered into Database? YES NO initials: _____
 Date Entered: _____ Time: _____
 Notes: _____

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

YSI Pro Plus (15D100020) _____
 YSI Pro DSS 1 _____
 YSI Pro DSS 2

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): 0.76
 Reference Point (description): SL

Water Quality Measurements

Temperature (°C) 5.10
 Specific Conductivity (µs/cm) 265.2
 Dissolved Oxygen (mg/L) 12.57

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: M.M. + ~~MM~~ VW.
 Sample Date: 2.12.16 Sample Time: 9:55 PDT:
 Base Flow or Storm Event? Field Filtered Time: 10:00 PST:
 (Must filter within 15 minutes of collection)

SITE ID: TOSMO
 Project Number: 14-05806-000



Project Name: Redmond Paired Watershed Study
 Current Weather and Temp: 31° F sunny

Water Quality Sampling

Sample ID: TOSMO-20160212

| Parameter | Bottle Type | Bottle Volume | # Bottles | Preservative | Duplicated? |
|---------------------------|-------------|---------------|-----------|--------------------------------|-------------|
| TSS and Turbidity | HDPE | 1L | 1 | NA | <u>NO</u> |
| DOC * | HDPE | 250 ml | 1 | HCL | ↓ |
| Fecal Col. Bact. | HDPE | 250 ml | 1 | EDTA | |
| T. Phosphorous | HDPE | 250 ml | 1 | H ₂ SO ₄ | |
| T. Nitrogen | HDPE | 250 ml | 1 | H ₂ SO ₄ | |
| Diss. Cu and Zn * | HDPE | 250 ml | 1 | HNO ₃ | |
| Hardness, Total Cu and Zn | HDPE | 500 ml | 1 | HNO ₃ | ↓ |

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID: _____
 Filter blank sample ID: _____
 Transfer blank sample ID: _____

Visual and Olfactory Conditions:

Clarity: clear
 Color: none
 Odor: none
 Sheen: none
 Floatables: none

LABORATORY DELIVERY

Date: _____ Time: _____

Quality Assurance

Checked By: Z. Lenth Signature: [Signature]
 Date Checked: 3-22-16 Time: _____
 Data Entered into Database? YES NO initials: _____
 Date Entered: _____ Time: _____
 Notes: _____

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

YSI Pro Plus (15D100020) _____
 YSI Pro DSS 1 _____
 YSI Pro DSS 2

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): 0.57
 Reference Point (description): SL

Water Quality Measurements

Temperature (°C) 4.6°
 Specific Conductivity (µs/cm) 242.7
 Dissolved Oxygen (mg/L) 12.92

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: MM + VW

SITE ID: T4LMI

Sample Date: 2.12.18 GA time: 12:00 Sample Time: ~~12:00~~ 11:50 PDT:

Base Flow or Storm Event? GA time: 12:00 Field Filtered Time: ~~12:00~~ 12:00 PST:
(Must filter within 15 minutes of collection)

Project Number: 14-05806-000



HERRERA

Project Name: Redmond Paired Watershed Study

Current Weather and Temp: 34° F sunny

Water Quality Sampling

Sample ID: T4LMI-20180201

| Parameter | Bottle Type | Bottle Volume | # Bottles | Preservative | Duplicated? |
|---------------------------|-------------|---------------|-----------|--------------------------------|-------------|
| TSS and Turbidity | HDPE | 1L | 1 | NA | <u>yes</u> |
| DOC * | HDPE | 250 ml | 1 | HCL | ↓ |
| Fecal Col. Bact. | HDPE | 250 ml | 1 | EDTA | |
| T. Phosphorous | HDPE | 250 ml | 1 | H ₂ SO ₄ | |
| T. Nitrogen | HDPE | 250 ml | 1 | H ₂ SO ₄ | |
| Diss. Cu and Zn * | HDPE | 250 ml | 1 | HNO ₃ | |
| Hardness, Total Cu and Zn | HDPE | 500 ml | 1 | HNO ₃ | |

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID: QA45-20180212

Filter blank sample ID: QA45-20180212

Transfer blank sample ID:

Visual and Olfactory Conditions:

Clarity: clear
 Color: none
 Odor: none
 Sheen: none
 Floatables: foam

LABORATORY DELIVERY

Date: _____ Time: _____

Quality Assurance

Checked By: S. Lenth Signature: [Signature]

Date Checked: 3-22-18 Time: _____

Data Entered into Database? YES NO initials: _____

Date Entered: _____ Time: _____

Notes: _____

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

YSI Pro Plus (15D100020) _____

YSI Pro DSS 1 _____

YSI Pro DSS 2

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): 4.58

Reference Point (description): top of culvert down

Water Quality Measurements

Temperature (°C) 5.9

Specific Conductivity (µs/cm) 168.3

Dissolved Oxygen (mg/L) 12.04

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: MM + VW

Sample Date: 2.12.18

Sample Time: 11:30

PDT:

SITE ID: TYLMO

Base Flow or Storm Event?

Field Filtered Time: 11:35

PST:

Project Number: 14-05806-000

(Must filter within 15 minutes of collection)



Project Name: Redmond Paired Watershed Study

Current Weather and Temp: 31°F sunny

Water Quality Sampling

Sample ID: TYLMO - 20180212

| Parameter | Bottle Type | Bottle Volume | # Bottles | Preservative | Duplicated? |
|---------------------------|-------------|---------------|-----------|--------------------------------|-------------|
| TSS and Turbidity | HDPE | 1L | 1 | NA | <u>NO</u> |
| DOC * | HDPE | 250 ml | 1 | HCL | |
| Fecal Col. Bact. | HDPE | 250 ml | 1 | EDTA | |
| T. Phosphorous | HDPE | 250 ml | 1 | H ₂ SO ₄ | |
| T Nitrogen | HDPE | 250 ml | 1 | H ₂ SO ₄ | |
| Diss. Cu and Zn * | HDPE | 250 ml | 1 | HNO ₃ | |
| Hardness, Total Cu and Zn | HDPE | 500 ml | 1 | HNO ₃ | |

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID: NA
 Filter blank sample ID: _____
 Transfer blank sample ID: _____

Visual and Olfactory Conditions:

Clarity: clear
 Color: none
 Odor: none
 Sheen: none
 Floatables: none

LABORATORY DELIVERY

Date: _____ Time: _____

Quality Assurance

Checked By: Z. Lenth Signature: [Signature]
 Date Checked: 2-22-18 Time: _____
 Data Entered into Database? YES NO initials:
 Date Entered: _____ Time: _____
 Notes: _____

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

YSI Pro Plus (15D100020) _____
 YSI Pro DSS 1 _____
 YSI Pro DSS 2 X

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): 2.87

Reference Point (description): top of culvert down

Water Quality Measurements

Temperature (°C) 4.6°
 Specific Conductivity (µs/cm) 167.3
 Dissolved Oxygen (mg/L) 13.01



HERRERA

Data Quality Assurance Worksheet

Project Name/No./Client: Redmond Paired Watershed Study / 14-05806-000 / City of Redmond

Laboratory/Parameters: OnSite Environmental : TSS, turbidity, hardness, DOC, TP, Dissolved & Total Cu, Zn / AmTest: Total nitrogen, fecal coliform bacteria

Sample Date/Sample ID: 2/12/2018 / All sites, 1 FD (QA45) at TYLMI

By G. Catarra

Date 3/12/18 Page 1 of 2

Checked: initials
JL

date 3/22/22

| Parameter | Completeness/ Methodology | Pre-preservation Holding Times (minutes) | | Total Holding Times (days) | | Method Blanks Reporting Limit | Matrix Spikes/ Surrogate Recovery (%) | | Lab Control Samples Recovery (%) | | Lab Duplicates RPD (%) | | Field Duplicates RPD (%) | | Instrument Calibration/ Performance | ACTION |
|-------------------------------------|------------------------------|--|------|-------------------------------|------|--|---|-------------------|--|-------------------|---------------------------|-------------------|-----------------------------|-------------------|---|----------------------|
| | | Reported | Goal | Reported | Goal | | Reported | Goal ¹ | Reported | Goal ¹ | Reported | Goal ¹ | Reported | Goal ¹ | | |
| TSS | OK / SM 2540D | NA | NA | 1 | ≤7 | ≤1.0 mg/L 1.0 mg/L | NA | NA | 86 | ±20 | 0 | ≤25 | 94 | ≤25 | OK | FLAG TYLMI DUE TO FD |
| Turbidity | OK / EPA 180.1 | NA | NA | 1 | ≤2 | ≤0.1 NTU 0.1 NTU | NA | NA | NA | ±10 | 2 | ≤25 | 65 | ≤25 | OK | FLAG TYLMI DUE TO FD |
| Hardness | OK / SM 2340B | NA | NA | 8 | ≤180 | ≤1.0 mg/L 1.0 mg/L | 105,107 | ±25 | 108 | ±15 | 0 | ≤20 | 1.3 | ≤20 | OK | NONE |
| DOC | OK / SM 5310B | <15 | ≤15 | 14 | ≤28 | ≤1.0 mg/L 1.0 mg/L | 97 | ±25 | 104 | ±15 | 2 | ≤20 | 3.7 | ≤20 | OK | NONE |
| Total Phosphorus | OK / EPA 365.1 | NA | NA | 15 | ≤28 | ≤0.01 mg/L 0.01 mg/L | 106 | ±25 | 103 | ±20 | NC | ≤20 | D=0.014 | ≤20 | OK | NONE |
| Total Nitrogen (TKN + N+N) | OK/ SM 4500 N-B | NA | NA | 8-11 | ≤28 | ≤0.1 mg/L 0.1 mg/L | 85,75 | ±25 | 91-110 | ±20 | 8.7,13 | ≤20 | D=0.032 16 | ≤20 | OK | NONE |

¹ If the sample or duplicate value is less than five times the reporting limit, the difference is calculated rather than the relative percent difference (RPD). The QA goal is a difference <2 times the detection limit instead of the number indicated in the goal column.

NA – not applicable or not available; NC – not calculable due to one or more values below the detection limit; NS – field duplicate not sampled.



Data Quality Assurance Worksheet

By G. Catarra

Project Name/No./Client: Redmond Paired Watershed Study / 14-05806-000 / City of Redmond

Date 3/12/18 Page 2 of 2

Laboratory/Parameters: OnSite Environmental : TSS, turbidity, hardness, DOC, TP, Dissolved & Total Cu, Zn / AmTest: total nitrogen, fecal coliform bacteria

Checked: initials
JL

Sample Date/Sample ID: 2/12/2018 / All sites, 1 FD (QA45) at TYLMI

date 3/22/18

| Parameter | Completeness/ Methodology | Pre-preservation Holding Times (minutes) | | Total Holding Times (days) | | Method Blanks Reporting Limit | Matrix Spikes/ Surrogate Recovery (%) | | Lab Control Samples Recovery (%) | | Lab Duplicates RPD (%) | | Field Duplicates RPD (%) | | Instrument Calibration/ Performance | ACTION |
|------------------|------------------------------|--|------|----------------------------|------|--|--|-------------------|----------------------------------|------|------------------------|-------------------|--------------------------|-------------------|--|--------|
| | | Reported | Goal | Reported | Goal | | Reported | Goal ¹ | Reported | Goal | Reported | Goal ¹ | Reported | Goal ¹ | | |
| Total Copper | OK/ EPA 200.8 | NA | NA | 8 | ≤180 | ≤1.0 µg/L 1.0 µg/L | 111,110 | ±25 | NR | ±15 | NC | ≤20 | D=0.1 | ≤20 | OK | NONE |
| Total Zinc | OK/ EPA 200.8 | NA | NA | 8 | ≤180 | ≤5.0 µg/L 5.0 µg/L | 114,114 | ±25 | NR | ±15 | NC | ≤20 | D=0.4 | ≤20 | OK | NONE |
| Dissolved Copper | OK/ EPA 200.8 | <15 | ≤15 | 8 | ≤180 | ≤1.0 µg/L 1.0 µg/L | 88,84 | ±25 | NR | ±15 | 3 | ≤20 | DIFF=1.0 | ≤20 | OK | NONE |
| Dissolved Zinc | OK/ EPA 200.8 | <15 | ≤15 | 8 | ≤180 | ≤5.0 µg/L 5.0 µg/L | 95,96 | ±25 | NR | ±15 | 1 | ≤20 | D=0.4 | ≤20 | OK | NONE |
| Fecal Coliform | OK/ SM 9222D | NA | NA | 1 | ≤1 | ≤1.0 cfu/ 100mL 10 cfu/ 100mL | NA | NA | NA | NA | 2,6 | ≤35 | 40 | ≤50 | OK | NONE |

¹ If the sample or duplicate value is less than five times the reporting limit, the difference is calculated rather than the relative percent difference (RPD). The QA goal is a difference <2 times the detection limit instead of the number indicated in the goal column.

NA – not applicable or not available; NC – not calculable due to one or more values below the detection limit; NS – field duplicate not sampled.



14648 NE 95th Street, Redmond, WA 98052 • (425) 883-3881

March 14, 2018

George Iftner
Herrera Environmental Consultants, Inc.
2200 6th Avenue, Suite 1100
Seattle, WA 98121

Re: Analytical Data for Project 14-05806-000
Laboratory Reference No. 1802-298

Dear George:

Enclosed are the analytical results and associated quality control data for samples submitted on March 1, 2018.

The standard policy of OnSite Environmental, Inc. is to store your samples for 30 days from the date of receipt. If you require longer storage, please contact the laboratory.

We appreciate the opportunity to be of service to you on this project. If you have any questions concerning the data, or need additional information, please feel free to call me.

Sincerely,

A handwritten signature in black ink, appearing to read "Blair Goodrow", enclosed within a large, loopy circular scribble.

Blair Goodrow
Project Manager

Enclosures



OnSite Environmental, Inc. 14648 NE 95th Street, Redmond, WA 98052 (425) 883-3881

This report pertains to the samples analyzed in accordance with the chain of custody, and is intended only for the use of the individual or company to whom it is addressed.

Date of Report: March 14, 2018
Samples Submitted: February 28, 2018
Laboratory Reference: 1802-298
Project: 14-05806-000

Case Narrative

Samples were collected on February 28, 2018 and received by the laboratory on February 28, 2018. They were maintained at the laboratory at a temperature of 2°C to 6°C.

Please note that any and all soil sample results are reported on a dry-weight basis, unless otherwise noted below.

General QA/QC issues associated with the analytical data enclosed in this laboratory report will be indicated with a reference to a comment or explanation on the Data Qualifier page. More complex and involved QA/QC issues will be discussed in detail below.



Date of Report: March 14, 2018
 Samples Submitted: February 28, 2018
 Laboratory Reference: 1802-298
 Project: 14-05806-000

**TOTAL SUSPENDED SOLIDS
 SM 2540D**

Matrix: Water
 Units: mg/L

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|------------------------|----------------------|-----|----------|---------------|---------------|-------|
| Client ID: | COLM-20180228 | | | | | |
| Laboratory ID: | 02-298-01 | | | | | |
| Total Suspended Solids | 2.2 | 1.0 | SM 2540D | 3-5-18 | 3-6-18 | |

| | | | | | | |
|------------------------|-----------------------|-----|----------|--------|--------|--|
| Client ID: | COUMI-20180228 | | | | | |
| Laboratory ID: | 02-298-02 | | | | | |
| Total Suspended Solids | 39 | 1.0 | SM 2540D | 3-5-18 | 3-6-18 | |

| | | | | | | |
|------------------------|-----------------------|-----|----------|--------|--------|--|
| Client ID: | COUMO-20180228 | | | | | |
| Laboratory ID: | 02-298-03 | | | | | |
| Total Suspended Solids | 25 | 1.0 | SM 2540D | 3-5-18 | 3-6-18 | |

| | | | | | | |
|------------------------|-----------------------|-----|----------|--------|--------|--|
| Client ID: | EVAMS-20180228 | | | | | |
| Laboratory ID: | 02-298-04 | | | | | |
| Total Suspended Solids | 11 | 1.0 | SM 2540D | 3-5-18 | 3-6-18 | |

| | | | | | | |
|------------------------|------------------------|-----|----------|--------|--------|--|
| Client ID: | EVALSS-20180228 | | | | | |
| Laboratory ID: | 02-298-05 | | | | | |
| Total Suspended Solids | 9.4 | 1.0 | SM 2540D | 3-5-18 | 3-6-18 | |

| | | | | | | |
|------------------------|-----------------------|-----|----------|--------|--------|--|
| Client ID: | MONMN-20180228 | | | | | |
| Laboratory ID: | 02-298-06 | | | | | |
| Total Suspended Solids | 7.0 | 1.0 | SM 2540D | 3-5-18 | 3-6-18 | |

| | | | | | | |
|------------------------|-----------------------|-----|----------|--------|--------|--|
| Client ID: | MONMS-20180228 | | | | | |
| Laboratory ID: | 02-298-07 | | | | | |
| Total Suspended Solids | 11 | 1.0 | SM 2540D | 3-5-18 | 3-6-18 | |



Date of Report: March 14, 2018
 Samples Submitted: February 28, 2018
 Laboratory Reference: 1802-298
 Project: 14-05806-000

**TOTAL SUSPENDED SOLIDS
 SM 2540D**

Matrix: Water
 Units: mg/L

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|------------------------|----------------------|-----|----------|---------------|---------------|-------|
| Client ID: | MONM-20180228 | | | | | |
| Laboratory ID: | 02-298-08 | | | | | |
| Total Suspended Solids | 17 | 1.0 | SM 2540D | 3-5-18 | 3-6-18 | |

| | | | | | | |
|------------------------|-----------------------|-----|----------|--------|--------|--|
| Client ID: | SEIMN-20180228 | | | | | |
| Laboratory ID: | 02-298-09 | | | | | |
| Total Suspended Solids | 25 | 1.0 | SM 2540D | 3-5-18 | 3-6-18 | |

| | | | | | | |
|------------------------|-----------------------|-----|----------|--------|--------|--|
| Client ID: | SEIMS-20180228 | | | | | |
| Laboratory ID: | 02-298-10 | | | | | |
| Total Suspended Solids | 28 | 1.0 | SM 2540D | 3-5-18 | 3-6-18 | |

| | | | | | | |
|------------------------|-----------------------|-----|----------|--------|--------|--|
| Client ID: | TOSMI-20180228 | | | | | |
| Laboratory ID: | 02-298-11 | | | | | |
| Total Suspended Solids | 49 | 1.0 | SM 2540D | 3-5-18 | 3-6-18 | |

| | | | | | | |
|------------------------|-----------------------|-----|----------|--------|--------|--|
| Client ID: | TOSMO-20180228 | | | | | |
| Laboratory ID: | 02-298-12 | | | | | |
| Total Suspended Solids | 81 | 1.4 | SM 2540D | 3-5-18 | 3-6-18 | |

| | | | | | | |
|------------------------|-----------------------|-----|----------|--------|--------|--|
| Client ID: | TYLMI-20180228 | | | | | |
| Laboratory ID: | 02-298-13 | | | | | |
| Total Suspended Solids | 12 | 1.0 | SM 2540D | 3-5-18 | 3-6-18 | |

| | | | | | | |
|------------------------|-----------------------|-----|----------|--------|--------|--|
| Client ID: | TYLMO-20180228 | | | | | |
| Laboratory ID: | 02-298-14 | | | | | |
| Total Suspended Solids | 80 | 1.4 | SM 2540D | 3-5-18 | 3-6-18 | |



Date of Report: March 14, 2018
Samples Submitted: February 28, 2018
Laboratory Reference: 1802-298
Project: 14-05806-000

**TOTAL SUSPENDED SOLIDS
SM 2540D**

Matrix: Water
Units: mg/L

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|------------------------|----------------------|------------|---------------|----------------------|----------------------|--------------|
| Client ID: | QA46-20180228 | | | | | |
| Laboratory ID: | 02-298-15 | | | | | |
| Total Suspended Solids | 71 | 1.4 | SM 2540D | 3-5-18 | 3-6-18 | |



Date of Report: March 14, 2018
 Samples Submitted: February 28, 2018
 Laboratory Reference: 1802-298
 Project: 14-05806-000

**TOTAL SUSPENDED SOLIDS
 SM 2540D
 QUALITY CONTROL**

Matrix: Water
 Units: mg/L

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|------------------------|-----------|-----|----------|---------------|---------------|-------|
| METHOD BLANK | | | | | | |
| Laboratory ID: | MB0305W1 | | | | | |
| Total Suspended Solids | ND | 1.0 | SM 2540D | 3-5-18 | 3-6-18 | |

| Analyte | Result | Spike Level | Source Result | Percent Recovery | Recovery Limits | RPD | RPD Limit | Flags |
|------------------------|-----------|-------------|---------------|------------------|-----------------|-----|-----------|-------|
| DUPLICATE | | | | | | | | |
| Laboratory ID: | 03-012-01 | | | | | | | |
| | ORIG | DUP | | | | | | |
| Total Suspended Solids | ND | ND | NA | NA | NA | NA | 17 | |

| | | | | | | | | |
|------------------------|-------------|-----|----|----|--------|----|----|--|
| SPIKE BLANK | | | | | | | | |
| Laboratory ID: | SB0305W1 | | | | | | | |
| | SB | SB | | SB | | | | |
| Total Suspended Solids | 85.0 | 100 | NA | 85 | 76-114 | NA | NA | |



Date of Report: March 14, 2018
 Samples Submitted: February 28, 2018
 Laboratory Reference: 1802-298
 Project: 14-05806-000

TURBIDITY
EPA 180.1

Matrix: Water
 Units: NTU

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|-------------------|----------------------|------|-----------|---------------|---------------|-------|
| Client ID: | COLM-20180228 | | | | | |
| Laboratory ID: | 02-298-01 | | | | | |
| Turbidity | 0.84 | 0.10 | EPA 180.1 | 3-1-18 | 3-1-18 | |

| | | | | | | |
|-------------------|-----------------------|------|-----------|--------|--------|--|
| Client ID: | COUMI-20180228 | | | | | |
| Laboratory ID: | 02-298-02 | | | | | |
| Turbidity | 10 | 0.10 | EPA 180.1 | 3-1-18 | 3-1-18 | |

| | | | | | | |
|-------------------|-----------------------|------|-----------|--------|--------|--|
| Client ID: | COUMO-20180228 | | | | | |
| Laboratory ID: | 02-298-03 | | | | | |
| Turbidity | 13 | 0.10 | EPA 180.1 | 3-1-18 | 3-1-18 | |

| | | | | | | |
|-------------------|-----------------------|------|-----------|--------|--------|--|
| Client ID: | EVAMS-20180228 | | | | | |
| Laboratory ID: | 02-298-04 | | | | | |
| Turbidity | 4.4 | 0.10 | EPA 180.1 | 3-1-18 | 3-1-18 | |

| | | | | | | |
|-------------------|------------------------|------|-----------|--------|--------|--|
| Client ID: | EVALSS-20180228 | | | | | |
| Laboratory ID: | 02-298-05 | | | | | |
| Turbidity | 4.6 | 0.10 | EPA 180.1 | 3-1-18 | 3-1-18 | |

| | | | | | | |
|-------------------|-----------------------|------|-----------|--------|--------|--|
| Client ID: | MONMN-20180228 | | | | | |
| Laboratory ID: | 02-298-06 | | | | | |
| Turbidity | 3.7 | 0.10 | EPA 180.1 | 3-1-18 | 3-1-18 | |

| | | | | | | |
|-------------------|-----------------------|------|-----------|--------|--------|--|
| Client ID: | MONMS-20180228 | | | | | |
| Laboratory ID: | 02-298-07 | | | | | |
| Turbidity | 5.6 | 0.10 | EPA 180.1 | 3-1-18 | 3-1-18 | |



Date of Report: March 14, 2018
 Samples Submitted: February 28, 2018
 Laboratory Reference: 1802-298
 Project: 14-05806-000

TURBIDITY
EPA 180.1

Matrix: Water
 Units: NTU

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|-------------------|----------------------|------|-----------|---------------|---------------|-------|
| Client ID: | MONM-20180228 | | | | | |
| Laboratory ID: | 02-298-08 | | | | | |
| Turbidity | 7.7 | 0.10 | EPA 180.1 | 3-1-18 | 3-1-18 | |

| | | | | | | |
|-------------------|-----------------------|------|-----------|--------|--------|--|
| Client ID: | SEIMN-20180228 | | | | | |
| Laboratory ID: | 02-298-09 | | | | | |
| Turbidity | 8.5 | 0.10 | EPA 180.1 | 3-1-18 | 3-1-18 | |

| | | | | | | |
|-------------------|-----------------------|------|-----------|--------|--------|--|
| Client ID: | SEIMS-20180228 | | | | | |
| Laboratory ID: | 02-298-10 | | | | | |
| Turbidity | 7.9 | 0.10 | EPA 180.1 | 3-1-18 | 3-1-18 | |

| | | | | | | |
|-------------------|-----------------------|------|-----------|--------|--------|--|
| Client ID: | TOSMI-20180228 | | | | | |
| Laboratory ID: | 02-298-11 | | | | | |
| Turbidity | 28 | 0.10 | EPA 180.1 | 3-1-18 | 3-1-18 | |

| | | | | | | |
|-------------------|-----------------------|------|-----------|--------|--------|--|
| Client ID: | TOSMO-20180228 | | | | | |
| Laboratory ID: | 02-298-12 | | | | | |
| Turbidity | 45 | 0.10 | EPA 180.1 | 3-1-18 | 3-1-18 | |

| | | | | | | |
|-------------------|-----------------------|------|-----------|--------|--------|--|
| Client ID: | TYLMI-20180228 | | | | | |
| Laboratory ID: | 02-298-13 | | | | | |
| Turbidity | 5.5 | 0.10 | EPA 180.1 | 3-1-18 | 3-1-18 | |

| | | | | | | |
|-------------------|-----------------------|------|-----------|--------|--------|--|
| Client ID: | TYLMO-20180228 | | | | | |
| Laboratory ID: | 02-298-14 | | | | | |
| Turbidity | 18 | 0.10 | EPA 180.1 | 3-1-18 | 3-1-18 | |



Date of Report: March 14, 2018
Samples Submitted: February 28, 2018
Laboratory Reference: 1802-298
Project: 14-05806-000

TURBIDITY
EPA 180.1

Matrix: Water
Units: NTU

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|-------------------|----------------------|------------|---------------|----------------------|----------------------|--------------|
| Client ID: | QA46-20180228 | | | | | |
| Laboratory ID: | 02-298-15 | | | | | |
| Turbidity | 36 | 0.10 | EPA 180.1 | 3-1-18 | 3-1-18 | |



Date of Report: March 14, 2018
 Samples Submitted: February 28, 2018
 Laboratory Reference: 1802-298
 Project: 14-05806-000

**TURBIDITY
 EPA 180.1
 QUALITY CONTROL**

Matrix: Water
 Units: NTU

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|---------------------|-----------|------|-----------|---------------|---------------|-------|
| METHOD BLANK | | | | | | |
| Laboratory ID: | MB0301W1 | | | | | |
| Turbidity | ND | 0.10 | EPA 180.1 | 3-1-18 | 3-1-18 | |

| Analyte | Result | Spike Level | Source Result | Percent Recovery | Recovery Limits | RPD | RPD Limit | Flags |
|------------------|-------------|-------------|---------------|------------------|-----------------|-----|-----------|-------|
| DUPLICATE | | | | | | | | |
| Laboratory ID: | 02-298-06 | | | | | | | |
| | ORIG | DUP | | | | | | |
| Turbidity | 3.69 | 3.76 | NA | NA | NA | NA | 2 | 15 |



Date of Report: March 14, 2018
 Samples Submitted: February 28, 2018
 Laboratory Reference: 1802-298
 Project: 14-05806-000

HARDNESS
EPA 200.7/SM 2340B

Matrix: Water
 Units: mg eqt. CaCO₃/L (ppm)

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|-------------------|----------------------|-----|----------------|---------------|---------------|-------|
| Client ID: | COLM-20180228 | | | | | |
| Laboratory ID: | 02-298-01 | | | | | |
| Hardness | 7.6 | 1.0 | 200.7/SM 2340B | 3-8-18 | 3-8-18 | |

| | | | | | | |
|-------------------|-----------------------|-----|----------------|--------|--------|--|
| Client ID: | COUMI-20180228 | | | | | |
| Laboratory ID: | 02-298-02 | | | | | |
| Hardness | 75 | 1.0 | 200.7/SM 2340B | 3-8-18 | 3-8-18 | |

| | | | | | | |
|-------------------|-----------------------|-----|----------------|--------|--------|--|
| Client ID: | COUMO-20180228 | | | | | |
| Laboratory ID: | 02-298-03 | | | | | |
| Hardness | 73 | 1.0 | 200.7/SM 2340B | 3-8-18 | 3-8-18 | |

| | | | | | | |
|-------------------|-----------------------|-----|----------------|--------|--------|--|
| Client ID: | EVAMS-20180228 | | | | | |
| Laboratory ID: | 02-298-04 | | | | | |
| Hardness | 80 | 1.0 | 200.7/SM 2340B | 3-8-18 | 3-8-18 | |

| | | | | | | |
|-------------------|------------------------|-----|----------------|--------|--------|--|
| Client ID: | EVALSS-20180228 | | | | | |
| Laboratory ID: | 02-298-05 | | | | | |
| Hardness | 74 | 1.0 | 200.7/SM 2340B | 3-8-18 | 3-8-18 | |

| | | | | | | |
|-------------------|-----------------------|-----|----------------|--------|--------|--|
| Client ID: | MONMN-20180228 | | | | | |
| Laboratory ID: | 02-298-06 | | | | | |
| Hardness | 47 | 1.0 | 200.7/SM 2340B | 3-8-18 | 3-8-18 | |

| | | | | | | |
|-------------------|-----------------------|-----|----------------|--------|--------|--|
| Client ID: | MONMS-20180228 | | | | | |
| Laboratory ID: | 02-298-07 | | | | | |
| Hardness | 97 | 1.0 | 200.7/SM 2340B | 3-8-18 | 3-8-18 | |



Date of Report: March 14, 2018
 Samples Submitted: February 28, 2018
 Laboratory Reference: 1802-298
 Project: 14-05806-000

HARDNESS
EPA 200.7/SM 2340B

Matrix: Water
 Units: mg eqt. CaCO₃/L (ppm)

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|-------------------|----------------------|-----|----------------|---------------|---------------|-------|
| Client ID: | MONM-20180228 | | | | | |
| Laboratory ID: | 02-298-08 | | | | | |
| Hardness | 70 | 1.0 | 200.7/SM 2340B | 3-8-18 | 3-8-18 | |

| | | | | | | |
|-------------------|-----------------------|-----|----------------|--------|--------|--|
| Client ID: | SEIMN-20180228 | | | | | |
| Laboratory ID: | 02-298-09 | | | | | |
| Hardness | 20 | 1.0 | 200.7/SM 2340B | 3-8-18 | 3-8-18 | |

| | | | | | | |
|-------------------|-----------------------|-----|----------------|--------|--------|--|
| Client ID: | SEIMS-20180228 | | | | | |
| Laboratory ID: | 02-298-10 | | | | | |
| Hardness | 36 | 1.0 | 200.7/SM 2340B | 3-8-18 | 3-8-18 | |

| | | | | | | |
|-------------------|-----------------------|-----|----------------|--------|--------|--|
| Client ID: | TOSMI-20180228 | | | | | |
| Laboratory ID: | 02-298-11 | | | | | |
| Hardness | 65 | 1.0 | 200.7/SM 2340B | 3-8-18 | 3-8-18 | |

| | | | | | | |
|-------------------|-----------------------|-----|----------------|--------|--------|--|
| Client ID: | TOSMO-20180228 | | | | | |
| Laboratory ID: | 02-298-12 | | | | | |
| Hardness | 71 | 1.0 | 200.7/SM 2340B | 3-8-18 | 3-8-18 | |

| | | | | | | |
|-------------------|-----------------------|-----|----------------|--------|--------|--|
| Client ID: | TYLMI-20180228 | | | | | |
| Laboratory ID: | 02-298-13 | | | | | |
| Hardness | 60 | 1.0 | 200.7/SM 2340B | 3-8-18 | 3-8-18 | |

| | | | | | | |
|-------------------|-----------------------|-----|----------------|--------|--------|--|
| Client ID: | TYLMO-20180228 | | | | | |
| Laboratory ID: | 02-298-14 | | | | | |
| Hardness | 41 | 1.0 | 200.7/SM 2340B | 3-8-18 | 3-8-18 | |



Date of Report: March 14, 2018
Samples Submitted: February 28, 2018
Laboratory Reference: 1802-298
Project: 14-05806-000

HARDNESS
EPA 200.7/SM 2340B

Matrix: Water
Units: mg eqt. CaCO₃/L (ppm)

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|-------------------|----------------------|------------|----------------|----------------------|----------------------|--------------|
| Client ID: | QA46-20180228 | | | | | |
| Laboratory ID: | 02-298-15 | | | | | |
| Hardness | 65 | 1.0 | 200.7/SM 2340B | 3-8-18 | 3-8-18 | |



Date of Report: March 14, 2018
 Samples Submitted: February 28, 2018
 Laboratory Reference: 1802-298
 Project: 14-05806-000

HARDNESS
EPA 200.7/SM 2340B
QUALITY CONTROL

Matrix: Water
 Units: mg eqt. CaCO₃/L (ppm)

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|---------------------|-----------|-----|----------------|---------------|---------------|-------|
| METHOD BLANK | | | | | | |
| Laboratory ID: | MB0308WH1 | | | | | |
| Hardness | ND | 1.0 | 200.7/SM 2340B | 3-8-18 | 3-8-18 | |

| Analyte | Result | Spike Level | Source Result | Percent Recovery | Recovery Limits | RPD | RPD Limit | Flags |
|------------------|-------------|-------------|---------------|------------------|-----------------|-----|-----------|-------|
| DUPLICATE | | | | | | | | |
| Laboratory ID: | 02-298-01 | | | | | | | |
| | ORIG | DUP | | | | | | |
| Hardness | 7.57 | 7.30 | NA | NA | NA | NA | 4 | 20 |

| Analyte | Result | Spike Level | Source Result | Percent Recovery | Recovery Limits | RPD | RPD Limit | Flags | | |
|----------------------|------------|-------------|---------------|------------------|-----------------|-----|-----------|--------|---|----|
| MATRIX SPIKES | | | | | | | | | | |
| Laboratory ID: | 02-298-01 | | | | | | | | | |
| | MS | MSD | MS | MSD | MS | MSD | | | | |
| Hardness | 143 | 139 | 132 | 132 | 7.57 | 103 | 100 | 75-125 | 3 | 20 |

| Analyte | Result | Spike Level | Source Result | Percent Recovery | Recovery Limits | RPD | RPD Limit | Flags |
|--------------------|------------|-------------|---------------|------------------|-----------------|-----|-----------|-------|
| SPIKE BLANK | | | | | | | | |
| Laboratory ID: | SB0308WH1 | | | | | | | |
| | SB | SB | | | SB | | | |
| Hardness | 135 | 132 | NA | 102 | 80-120 | NA | NA | |



Date of Report: March 14, 2018
 Samples Submitted: February 28, 2018
 Laboratory Reference: 1802-298
 Project: 14-05806-000

**DISSOLVED ORGANIC CARBON
 SM 5310B**

Matrix: Water
 Units: mg/L

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|--------------------------|------------------------|-----|----------|---------------|---------------|-------|
| Client ID: | COLM-20180228 | | | | | |
| Laboratory ID: | 02-298-01 | | | | | |
| Dissolved Organic Carbon | 8.8 | 1.0 | SM 5310B | 3-8-18 | 3-8-18 | |
| Client ID: | COUMI-20180228 | | | | | |
| Laboratory ID: | 02-298-02 | | | | | |
| Dissolved Organic Carbon | 3.6 | 1.0 | SM 5310B | 3-8-18 | 3-8-18 | |
| Client ID: | COUMO-20180228 | | | | | |
| Laboratory ID: | 02-298-03 | | | | | |
| Dissolved Organic Carbon | 4.1 | 1.0 | SM 5310B | 3-8-18 | 3-8-18 | |
| Client ID: | EVAMS-20180228 | | | | | |
| Laboratory ID: | 02-298-04 | | | | | |
| Dissolved Organic Carbon | 4.5 | 1.0 | SM 5310B | 3-8-18 | 3-8-18 | |
| Client ID: | EVALSS-20180228 | | | | | |
| Laboratory ID: | 02-298-05 | | | | | |
| Dissolved Organic Carbon | 4.1 | 1.0 | SM 5310B | 3-8-18 | 3-8-18 | |
| Client ID: | MONMN-20180228 | | | | | |
| Laboratory ID: | 02-298-06 | | | | | |
| Dissolved Organic Carbon | 4.2 | 1.0 | SM 5310B | 3-8-18 | 3-8-18 | |
| Client ID: | MONMS-20180228 | | | | | |
| Laboratory ID: | 02-298-07 | | | | | |
| Dissolved Organic Carbon | 5.5 | 1.0 | SM 5310B | 3-8-18 | 3-8-18 | |



Date of Report: March 14, 2018
 Samples Submitted: February 28, 2018
 Laboratory Reference: 1802-298
 Project: 14-05806-000

**DISSOLVED ORGANIC CARBON
 SM 5310B**

Matrix: Water
 Units: mg/L

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|--------------------------|-----------------------|-----|----------|---------------|---------------|-------|
| Client ID: | MONM-20180228 | | | | | |
| Laboratory ID: | 02-298-08 | | | | | |
| Dissolved Organic Carbon | 4.4 | 1.0 | SM 5310B | 3-8-18 | 3-8-18 | |
| Client ID: | SEIMN-20180228 | | | | | |
| Laboratory ID: | 02-298-09 | | | | | |
| Dissolved Organic Carbon | 7.7 | 1.0 | SM 5310B | 3-8-18 | 3-8-18 | |
| Client ID: | SEIMS-20180228 | | | | | |
| Laboratory ID: | 02-298-10 | | | | | |
| Dissolved Organic Carbon | 6.2 | 1.0 | SM 5310B | 3-8-18 | 3-8-18 | |
| Client ID: | TOSMI-20180228 | | | | | |
| Laboratory ID: | 02-298-11 | | | | | |
| Dissolved Organic Carbon | 4.2 | 1.0 | SM 5310B | 3-8-18 | 3-8-18 | |
| Client ID: | TOSMO-20180228 | | | | | |
| Laboratory ID: | 02-298-12 | | | | | |
| Dissolved Organic Carbon | 4.4 | 1.0 | SM 5310B | 3-8-18 | 3-8-18 | |
| Client ID: | TYLMI-20180228 | | | | | |
| Laboratory ID: | 02-298-13 | | | | | |
| Dissolved Organic Carbon | 5.2 | 1.0 | SM 5310B | 3-8-18 | 3-8-18 | |
| Client ID: | TYLMO-20180228 | | | | | |
| Laboratory ID: | 02-298-14 | | | | | |
| Dissolved Organic Carbon | 3.3 | 1.0 | SM 5310B | 3-8-18 | 3-8-18 | |



Date of Report: March 14, 2018
Samples Submitted: February 28, 2018
Laboratory Reference: 1802-298
Project: 14-05806-000

**DISSOLVED ORGANIC CARBON
SM 5310B**

Matrix: Water
Units: mg/L

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|--------------------------|----------------------|------------|---------------|----------------------|----------------------|--------------|
| Client ID: | QA46-20180228 | | | | | |
| Laboratory ID: | 02-298-15 | | | | | |
| Dissolved Organic Carbon | 4.2 | 1.0 | SM 5310B | 3-8-18 | 3-8-18 | |



Date of Report: March 14, 2018
 Samples Submitted: February 28, 2018
 Laboratory Reference: 1802-298
 Project: 14-05806-000

**DISSOLVED ORGANIC CARBON
 SM 5310B
 QUALITY CONTROL**

Matrix: Water
 Units: mg/L

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|--------------------------|-----------|-----|----------|---------------|---------------|-------|
| METHOD BLANK | | | | | | |
| Laboratory ID: | MB0308D1 | | | | | |
| Dissolved Organic Carbon | ND | 1.0 | SM 5310B | 3-8-18 | 3-8-18 | |

| Analyte | Result | Spike Level | Source Result | Percent Recovery | Recovery Limits | RPD | RPD Limit | Flags |
|--------------------------|-------------|-------------|---------------|------------------|-----------------|-----|-----------|-------|
| DUPLICATE | | | | | | | | |
| Laboratory ID: | 02-298-01 | | | | | | | |
| | ORIG | DUP | | | | | | |
| Dissolved Organic Carbon | 8.76 | 8.93 | NA | NA | NA | 2 | 15 | |

MATRIX SPIKE

| | | | | | | | | |
|--------------------------|-------------|------|------|----|--------|----|----|--|
| Laboratory ID: | 02-298-01 | | | | | | | |
| | MS | MS | | MS | | | | |
| Dissolved Organic Carbon | 18.6 | 10.0 | 8.76 | 98 | 75-125 | NA | NA | |

SPIKE BLANK

| | | | | | | | | |
|--------------------------|-------------|------|----|-----|--------|----|----|--|
| Laboratory ID: | SB0308D1 | | | | | | | |
| | SB | SB | | SB | | | | |
| Dissolved Organic Carbon | 10.1 | 10.0 | NA | 101 | 80-120 | NA | NA | |



Date of Report: March 14, 2018
 Samples Submitted: February 28, 2018
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 Project: 14-05806-000

TOTAL PHOSPHORUS
EPA 365.1

Matrix: Water
 Units: mg/L

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|-------------------|----------------------|-------|-----------|---------------|---------------|-------|
| Client ID: | COLM-20180228 | | | | | |
| Laboratory ID: | 02-298-01 | | | | | |
| Total Phosphorus | ND | 0.010 | EPA 365.1 | 3-7-18 | 3-7-18 | |

| | | | | | | |
|-------------------|-----------------------|-------|-----------|--------|--------|--|
| Client ID: | COUMI-20180228 | | | | | |
| Laboratory ID: | 02-298-02 | | | | | |
| Total Phosphorus | 0.076 | 0.010 | EPA 365.1 | 3-7-18 | 3-7-18 | |

| | | | | | | |
|-------------------|-----------------------|-------|-----------|--------|--------|--|
| Client ID: | COUMO-20180228 | | | | | |
| Laboratory ID: | 02-298-03 | | | | | |
| Total Phosphorus | 0.044 | 0.010 | EPA 365.1 | 3-7-18 | 3-7-18 | |

| | | | | | | |
|-------------------|-----------------------|-------|-----------|--------|--------|--|
| Client ID: | EVAMS-20180228 | | | | | |
| Laboratory ID: | 02-298-04 | | | | | |
| Total Phosphorus | ND | 0.010 | EPA 365.1 | 3-7-18 | 3-7-18 | |

| | | | | | | |
|-------------------|------------------------|-------|-----------|--------|--------|--|
| Client ID: | EVALSS-20180228 | | | | | |
| Laboratory ID: | 02-298-05 | | | | | |
| Total Phosphorus | 0.012 | 0.010 | EPA 365.1 | 3-7-18 | 3-7-18 | |

| | | | | | | |
|-------------------|-----------------------|-------|-----------|--------|--------|--|
| Client ID: | MONMN-20180228 | | | | | |
| Laboratory ID: | 02-298-06 | | | | | |
| Total Phosphorus | 0.020 | 0.010 | EPA 365.1 | 3-7-18 | 3-7-18 | |

| | | | | | | |
|-------------------|-----------------------|-------|-----------|--------|--------|--|
| Client ID: | MONMS-20180228 | | | | | |
| Laboratory ID: | 02-298-07 | | | | | |
| Total Phosphorus | 0.030 | 0.010 | EPA 365.1 | 3-7-18 | 3-7-18 | |



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 Project: 14-05806-000

TOTAL PHOSPHORUS
EPA 365.1

Matrix: Water
 Units: mg/L

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|-------------------|----------------------|-------|-----------|---------------|---------------|-------|
| Client ID: | MONM-20180228 | | | | | |
| Laboratory ID: | 02-298-08 | | | | | |
| Total Phosphorus | 0.031 | 0.010 | EPA 365.1 | 3-7-18 | 3-7-18 | |

| | | | | | | |
|-------------------|-----------------------|-------|-----------|--------|--------|--|
| Client ID: | SEIMN-20180228 | | | | | |
| Laboratory ID: | 02-298-09 | | | | | |
| Total Phosphorus | 0.023 | 0.010 | EPA 365.1 | 3-7-18 | 3-7-18 | |

| | | | | | | |
|-------------------|-----------------------|-------|-----------|--------|--------|--|
| Client ID: | SEIMS-20180228 | | | | | |
| Laboratory ID: | 02-298-10 | | | | | |
| Total Phosphorus | 0.036 | 0.010 | EPA 365.1 | 3-7-18 | 3-7-18 | |

| | | | | | | |
|-------------------|-----------------------|-------|-----------|--------|--------|--|
| Client ID: | TOSMI-20180228 | | | | | |
| Laboratory ID: | 02-298-11 | | | | | |
| Total Phosphorus | 0.051 | 0.010 | EPA 365.1 | 3-7-18 | 3-7-18 | |

| | | | | | | |
|-------------------|-----------------------|-------|-----------|--------|--------|--|
| Client ID: | TOSMO-20180228 | | | | | |
| Laboratory ID: | 02-298-12 | | | | | |
| Total Phosphorus | 0.12 | 0.010 | EPA 365.1 | 3-7-18 | 3-7-18 | |

| | | | | | | |
|-------------------|-----------------------|-------|-----------|--------|--------|--|
| Client ID: | TYLMI-20180228 | | | | | |
| Laboratory ID: | 02-298-13 | | | | | |
| Total Phosphorus | 0.021 | 0.010 | EPA 365.1 | 3-7-18 | 3-7-18 | |

| | | | | | | |
|-------------------|-----------------------|-------|-----------|--------|--------|--|
| Client ID: | TYLMO-20180228 | | | | | |
| Laboratory ID: | 02-298-14 | | | | | |
| Total Phosphorus | 0.13 | 0.010 | EPA 365.1 | 3-7-18 | 3-7-18 | |



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Project: 14-05806-000

TOTAL PHOSPHORUS
EPA 365.1

Matrix: Water
Units: mg/L

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|-------------------|----------------------|------------|---------------|----------------------|----------------------|--------------|
| Client ID: | QA46-20180228 | | | | | |
| Laboratory ID: | 02-298-15 | | | | | |
| Total Phosphorus | 0.097 | 0.010 | EPA 365.1 | 3-7-18 | 3-7-18 | |



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 Project: 14-05806-000

**TOTAL PHOSPHORUS
 EPA 365.1
 QUALITY CONTROL**

Matrix: Water
 Units: mg/L

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|---------------------|-----------|-------|-----------|---------------|---------------|-------|
| METHOD BLANK | | | | | | |
| Laboratory ID: | MB0307W1 | | | | | |
| Total Phosphorus | ND | 0.010 | EPA 365.1 | 3-7-18 | 3-7-18 | |

| Analyte | Result | Spike Level | Source Result | Percent Recovery | Recovery Limits | RPD | RPD Limit | Flags |
|------------------|-----------|-------------|---------------|------------------|-----------------|-----|-----------|-------|
| DUPLICATE | | | | | | | | |
| Laboratory ID: | 02-298-01 | | | | | | | |
| | ORIG | DUP | | | | | | |
| Total Phosphorus | ND | ND | NA | NA | NA | NA | 11 | |

| | | | | | | | | |
|---------------------|--------------|-------|----|-----|--------|----|----|--|
| MATRIX SPIKE | | | | | | | | |
| Laboratory ID: | 02-298-01 | | | | | | | |
| | MS | MS | | MS | | | | |
| Total Phosphorus | 0.254 | 0.250 | ND | 102 | 82-124 | NA | NA | |

| | | | | | | | | |
|--------------------|--------------|-------|----|-----|--------|----|----|--|
| SPIKE BLANK | | | | | | | | |
| Laboratory ID: | SB0307W1 | | | | | | | |
| | SB | SB | | SB | | | | |
| Total Phosphorus | 0.255 | 0.250 | NA | 102 | 87-114 | NA | NA | |



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 Project: 14-05806-000

**TOTAL METALS
 EPA 200.8**

Matrix: Water
 Units: ug/L (ppb)

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|-------------------|----------------------|-----|-----------|---------------|---------------|-------|
| Client ID: | COLM-20180228 | | | | | |
| Laboratory ID: | 02-298-01 | | | | | |
| Copper | ND | 1.0 | EPA 200.8 | 3-8-18 | 3-8-18 | |
| Zinc | ND | 5.0 | EPA 200.8 | 3-8-18 | 3-8-18 | |

| | | | | | | |
|-------------------|-----------------------|-----|-----------|--------|--------|--|
| Client ID: | COUMI-20180228 | | | | | |
| Laboratory ID: | 02-298-02 | | | | | |
| Copper | 3.7 | 1.0 | EPA 200.8 | 3-8-18 | 3-8-18 | |
| Zinc | 15 | 5.0 | EPA 200.8 | 3-8-18 | 3-8-18 | |

| | | | | | | |
|-------------------|-----------------------|-----|-----------|--------|--------|--|
| Client ID: | COUMO-20180228 | | | | | |
| Laboratory ID: | 02-298-03 | | | | | |
| Copper | 5.5 | 1.0 | EPA 200.8 | 3-8-18 | 3-8-18 | |
| Zinc | 31 | 5.0 | EPA 200.8 | 3-8-18 | 3-8-18 | |

| | | | | | | |
|-------------------|-----------------------|-----|-----------|--------|--------|--|
| Client ID: | EVAMS-20180228 | | | | | |
| Laboratory ID: | 02-298-04 | | | | | |
| Copper | ND | 1.0 | EPA 200.8 | 3-8-18 | 3-8-18 | |
| Zinc | ND | 5.0 | EPA 200.8 | 3-8-18 | 3-8-18 | |

| | | | | | | |
|-------------------|------------------------|-----|-----------|--------|--------|--|
| Client ID: | EVALSS-20180228 | | | | | |
| Laboratory ID: | 02-298-05 | | | | | |
| Copper | ND | 1.0 | EPA 200.8 | 3-8-18 | 3-8-18 | |
| Zinc | ND | 5.0 | EPA 200.8 | 3-8-18 | 3-8-18 | |

| | | | | | | |
|-------------------|-----------------------|-----|-----------|--------|--------|--|
| Client ID: | MONMN-20180228 | | | | | |
| Laboratory ID: | 02-298-06 | | | | | |
| Copper | 1.3 | 1.0 | EPA 200.8 | 3-8-18 | 3-8-18 | |
| Zinc | 5.5 | 5.0 | EPA 200.8 | 3-8-18 | 3-8-18 | |

| | | | | | | |
|-------------------|-----------------------|-----|-----------|--------|--------|--|
| Client ID: | MONMS-20180228 | | | | | |
| Laboratory ID: | 02-298-07 | | | | | |
| Copper | 2.4 | 1.0 | EPA 200.8 | 3-8-18 | 3-8-18 | |
| Zinc | 6.3 | 5.0 | EPA 200.8 | 3-8-18 | 3-8-18 | |



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 Samples Submitted: February 28, 2018
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 Project: 14-05806-000

**TOTAL METALS
 EPA 200.8**

Matrix: Water
 Units: ug/L (ppb)

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|-------------------|----------------------|-----|-----------|---------------|---------------|-------|
| Client ID: | MONM-20180228 | | | | | |
| Laboratory ID: | 02-298-08 | | | | | |
| Copper | 2.1 | 1.0 | EPA 200.8 | 3-8-18 | 3-8-18 | |
| Zinc | 16 | 5.0 | EPA 200.8 | 3-8-18 | 3-8-18 | |

| | | | | | | |
|-------------------|-----------------------|-----|-----------|--------|--------|--|
| Client ID: | SEIMN-20180228 | | | | | |
| Laboratory ID: | 02-298-09 | | | | | |
| Copper | 1.6 | 1.0 | EPA 200.8 | 3-8-18 | 3-8-18 | |
| Zinc | ND | 5.0 | EPA 200.8 | 3-8-18 | 3-8-18 | |

| | | | | | | |
|-------------------|-----------------------|-----|-----------|--------|--------|--|
| Client ID: | SEIMS-20180228 | | | | | |
| Laboratory ID: | 02-298-10 | | | | | |
| Copper | 2.3 | 1.0 | EPA 200.8 | 3-8-18 | 3-8-18 | |
| Zinc | ND | 5.0 | EPA 200.8 | 3-8-18 | 3-8-18 | |

| | | | | | | |
|-------------------|-----------------------|-----|-----------|--------|--------|--|
| Client ID: | TOSMI-20180228 | | | | | |
| Laboratory ID: | 02-298-11 | | | | | |
| Copper | 9.5 | 1.0 | EPA 200.8 | 3-8-18 | 3-8-18 | |
| Zinc | 60 | 5.0 | EPA 200.8 | 3-8-18 | 3-8-18 | |

| | | | | | | |
|-------------------|-----------------------|-----|-----------|--------|--------|--|
| Client ID: | TOSMO-20180228 | | | | | |
| Laboratory ID: | 02-298-12 | | | | | |
| Copper | 10 | 1.0 | EPA 200.8 | 3-8-18 | 3-8-18 | |
| Zinc | 81 | 5.0 | EPA 200.8 | 3-8-18 | 3-8-18 | |

| | | | | | | |
|-------------------|-----------------------|-----|-----------|--------|--------|--|
| Client ID: | TYLMI-20180228 | | | | | |
| Laboratory ID: | 02-298-13 | | | | | |
| Copper | 3.2 | 1.0 | EPA 200.8 | 3-8-18 | 3-8-18 | |
| Zinc | 9.8 | 5.0 | EPA 200.8 | 3-8-18 | 3-8-18 | |

| | | | | | | |
|-------------------|-----------------------|-----|-----------|--------|--------|--|
| Client ID: | TYLMO-20180228 | | | | | |
| Laboratory ID: | 02-298-14 | | | | | |
| Copper | 9.3 | 1.0 | EPA 200.8 | 3-8-18 | 3-8-18 | |
| Zinc | 50 | 5.0 | EPA 200.8 | 3-8-18 | 3-8-18 | |



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Project: 14-05806-000

TOTAL METALS
EPA 200.8

Matrix: Water
Units: ug/L (ppb)

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|-------------------|----------------------|------------|---------------|----------------------|----------------------|--------------|
| Client ID: | QA46-20180228 | | | | | |
| Laboratory ID: | 02-298-15 | | | | | |
| Copper | 11 | 1.0 | EPA 200.8 | 3-8-18 | 3-8-18 | |
| Zinc | 86 | 5.0 | EPA 200.8 | 3-8-18 | 3-8-18 | |



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**TOTAL METALS
 EPA 200.8
 QUALITY CONTROL**

Matrix: Water
 Units: ug/L (ppb)

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|---------------------|-----------|-----|-----------|---------------|---------------|-------|
| METHOD BLANK | | | | | | |
| Laboratory ID: | MB0308WH1 | | | | | |
| Copper | ND | 1.0 | EPA 200.8 | 3-8-18 | 3-8-18 | |
| Zinc | ND | 5.0 | EPA 200.8 | 3-8-18 | 3-8-18 | |

| Analyte | Result | Spike Level | Source Result | Percent Recovery | Recovery Limits | RPD | RPD Limit | Flags |
|------------------|-------------|-------------|---------------|------------------|-----------------|-----|-----------|-------|
| DUPLICATE | | | | | | | | |
| Laboratory ID: | 02-298-06 | | | | | | | |
| | ORIG | DUP | | | | | | |
| Copper | 1.33 | 1.40 | NA | NA | NA | NA | 5 | 20 |
| Zinc | 5.50 | 5.32 | NA | NA | NA | NA | 3 | 20 |

MATRIX SPIKES

| | | | | | | | | | | |
|----------------|------------|------------|-----|-----|------|------------|------------|--------|---|----|
| Laboratory ID: | 02-298-06 | | | | | | | | | |
| | MS | MSD | MS | MSD | | MS | MSD | | | |
| Copper | 108 | 106 | 100 | 100 | 1.33 | 106 | 105 | 75-125 | 1 | 20 |
| Zinc | 114 | 114 | 100 | 100 | 5.50 | 109 | 108 | 75-125 | 0 | 20 |



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 Project: 14-05806-000

**DISSOLVED METALS
 EPA 200.8**

Matrix: Water
 Units: ug/L (ppb)

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|-------------------|----------------------|-----|-----------|---------------|---------------|-------|
| Client ID: | COLM-20180228 | | | | | |
| Laboratory ID: | 02-298-01 | | | | | |
| Copper | ND | 1.0 | EPA 200.8 | | 3-7-18 | |
| Zinc | ND | 5.0 | EPA 200.8 | | 3-7-18 | |

| | | | | | | |
|-------------------|-----------------------|-----|-----------|--|--------|--|
| Client ID: | COUMI-20180228 | | | | | |
| Laboratory ID: | 02-298-02 | | | | | |
| Copper | 1.4 | 1.0 | EPA 200.8 | | 3-7-18 | |
| Zinc | ND | 5.0 | EPA 200.8 | | 3-7-18 | |

| | | | | | | |
|-------------------|-----------------------|-----|-----------|--|--------|--|
| Client ID: | COUMO-20180228 | | | | | |
| Laboratory ID: | 02-298-03 | | | | | |
| Copper | 2.8 | 1.0 | EPA 200.8 | | 3-7-18 | |
| Zinc | 19 | 5.0 | EPA 200.8 | | 3-7-18 | |

| | | | | | | |
|-------------------|-----------------------|-----|-----------|--|--------|--|
| Client ID: | EVAMS-20180228 | | | | | |
| Laboratory ID: | 02-298-04 | | | | | |
| Copper | ND | 1.0 | EPA 200.8 | | 3-7-18 | |
| Zinc | ND | 5.0 | EPA 200.8 | | 3-7-18 | |

| | | | | | | |
|-------------------|------------------------|-----|-----------|--|--------|--|
| Client ID: | EVALSS-20180228 | | | | | |
| Laboratory ID: | 02-298-05 | | | | | |
| Copper | ND | 1.0 | EPA 200.8 | | 3-7-18 | |
| Zinc | ND | 5.0 | EPA 200.8 | | 3-7-18 | |

| | | | | | | |
|-------------------|-----------------------|-----|-----------|--|--------|--|
| Client ID: | MONMN-20180228 | | | | | |
| Laboratory ID: | 02-298-06 | | | | | |
| Copper | ND | 1.0 | EPA 200.8 | | 3-7-18 | |
| Zinc | ND | 5.0 | EPA 200.8 | | 3-7-18 | |

| | | | | | | |
|-------------------|-----------------------|-----|-----------|--|--------|--|
| Client ID: | MONMS-20180228 | | | | | |
| Laboratory ID: | 02-298-07 | | | | | |
| Copper | 1.7 | 1.0 | EPA 200.8 | | 3-7-18 | |
| Zinc | ND | 5.0 | EPA 200.8 | | 3-7-18 | |



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 Project: 14-05806-000

**DISSOLVED METALS
 EPA 200.8**

Matrix: Water
 Units: ug/L (ppb)

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|-------------------|----------------------|-----|-----------|---------------|---------------|-------|
| Client ID: | MONM-20180228 | | | | | |
| Laboratory ID: | 02-298-08 | | | | | |
| Copper | 1.1 | 1.0 | EPA 200.8 | | 3-7-18 | |
| Zinc | 6.8 | 5.0 | EPA 200.8 | | 3-7-18 | |

| | | | | | | |
|-------------------|-----------------------|-----|-----------|--|--------|--|
| Client ID: | SEIMN-20180228 | | | | | |
| Laboratory ID: | 02-298-09 | | | | | |
| Copper | ND | 1.0 | EPA 200.8 | | 3-7-18 | |
| Zinc | ND | 5.0 | EPA 200.8 | | 3-7-18 | |

| | | | | | | |
|-------------------|-----------------------|-----|-----------|--|--------|--|
| Client ID: | SEIMS-20180228 | | | | | |
| Laboratory ID: | 02-298-10 | | | | | |
| Copper | ND | 1.0 | EPA 200.8 | | 3-7-18 | |
| Zinc | ND | 5.0 | EPA 200.8 | | 3-7-18 | |

| | | | | | | |
|-------------------|-----------------------|-----|-----------|--|--------|--|
| Client ID: | TOSMI-20180228 | | | | | |
| Laboratory ID: | 02-298-11 | | | | | |
| Copper | 4.6 | 1.0 | EPA 200.8 | | 3-7-18 | |
| Zinc | 28 | 5.0 | EPA 200.8 | | 3-7-18 | |

| | | | | | | |
|-------------------|-----------------------|-----|-----------|--|--------|--|
| Client ID: | TOSMO-20180228 | | | | | |
| Laboratory ID: | 02-298-12 | | | | | |
| Copper | 3.2 | 1.0 | EPA 200.8 | | 3-7-18 | |
| Zinc | 18 | 5.0 | EPA 200.8 | | 3-7-18 | |

| | | | | | | |
|-------------------|-----------------------|-----|-----------|--|--------|--|
| Client ID: | TYLMI-20180228 | | | | | |
| Laboratory ID: | 02-298-13 | | | | | |
| Copper | 2.4 | 1.0 | EPA 200.8 | | 3-7-18 | |
| Zinc | 7.5 | 5.0 | EPA 200.8 | | 3-7-18 | |

| | | | | | | |
|-------------------|-----------------------|-----|-----------|--|--------|--|
| Client ID: | TYLMO-20180228 | | | | | |
| Laboratory ID: | 02-298-14 | | | | | |
| Copper | 2.6 | 1.0 | EPA 200.8 | | 3-7-18 | |
| Zinc | 6.3 | 5.0 | EPA 200.8 | | 3-7-18 | |



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Project: 14-05806-000

DISSOLVED METALS
EPA 200.8

Matrix: Water
Units: ug/L (ppb)

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|-------------------|----------------------|------------|---------------|----------------------|----------------------|--------------|
| Client ID: | QA46-20180228 | | | | | |
| Laboratory ID: | 02-298-15 | | | | | |
| Copper | 4.2 | 1.0 | EPA 200.8 | | 3-7-18 | |
| Zinc | 17 | 5.0 | EPA 200.8 | | 3-7-18 | |



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**DISSOLVED METALS
 EPA 200.8
 QUALITY CONTROL**

Matrix: Water
 Units: ug/L (ppb)

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|---------------------|-----------|-----|-----------|---------------|---------------|-------|
| METHOD BLANK | | | | | | |
| Laboratory ID: | MB0307D1 | | | | | |
| Copper | ND | 1.0 | EPA 200.8 | | 3-7-18 | |
| Zinc | ND | 5.0 | EPA 200.8 | | 3-7-18 | |

| Analyte | Result | Spike Level | Source Result | Percent Recovery | Recovery Limits | RPD | RPD Limit | Flags |
|------------------|-------------|-------------|---------------|------------------|-----------------|-----|-----------|-------|
| DUPLICATE | | | | | | | | |
| Laboratory ID: | 02-298-15 | | | | | | | |
| | ORIG | DUP | | | | | | |
| Copper | 4.24 | 4.08 | NA | NA | NA | NA | 4 | 20 |
| Zinc | 17.1 | 16.7 | NA | NA | NA | NA | 2 | 20 |

MATRIX SPIKES

| | | | | | | | | | | |
|----------------|-------------|-------------|------|------|------|------------|-----------|--------|---|----|
| Laboratory ID: | 02-298-15 | | | | | | | | | |
| | MS | MSD | MS | MSD | | MS | MSD | | | |
| Copper | 80.0 | 79.0 | 80.0 | 80.0 | 4.24 | 95 | 94 | 75-125 | 1 | 20 |
| Zinc | 100 | 96.6 | 80.0 | 80.0 | 17.1 | 104 | 99 | 75-125 | 4 | 20 |





Data Qualifiers and Abbreviations

- A - Due to a high sample concentration, the amount spiked is insufficient for meaningful MS/MSD recovery data.
 - B - The analyte indicated was also found in the blank sample.
 - C - The duplicate RPD is outside control limits due to high result variability when analyte concentrations are within five times the quantitation limit.
 - E - The value reported exceeds the quantitation range and is an estimate.
 - F - Surrogate recovery data is not available due to the high concentration of coeluting target compounds.
 - H - The analyte indicated is a common laboratory solvent and may have been introduced during sample preparation, and be impacting the sample result.
 - I - Compound recovery is outside of the control limits.
 - J - The value reported was below the practical quantitation limit. The value is an estimate.
 - K - Sample duplicate RPD is outside control limits due to sample inhomogeneity. The sample was re-extracted and re-analyzed with similar results.
 - L - The RPD is outside of the control limits.
 - M - Hydrocarbons in the gasoline range are impacting the diesel range result.
 - M1 - Hydrocarbons in the gasoline range (toluene-naphthalene) are present in the sample.
 - N - Hydrocarbons in the lube oil range are impacting the diesel range result.
 - N1 - Hydrocarbons in diesel range are impacting lube oil range results.
 - O - Hydrocarbons indicative of heavier fuels are present in the sample and are impacting the gasoline result.
 - P - The RPD of the detected concentrations between the two columns is greater than 40.
 - Q - Surrogate recovery is outside of the control limits.
 - S - Surrogate recovery data is not available due to the necessary dilution of the sample.
 - T - The sample chromatogram is not similar to a typical _____.
 - U - The analyte was analyzed for, but was not detected above the reported sample quantitation limit.
 - U1 - The practical quantitation limit is elevated due to interferences present in the sample.
 - V - Matrix Spike/Matrix Spike Duplicate recoveries are outside control limits due to matrix effects.
 - W - Matrix Spike/Matrix Spike Duplicate RPD are outside control limits due to matrix effects.
 - X - Sample extract treated with a mercury cleanup procedure.
 - X1 - Sample extract treated with a sulfuric acid/silica gel cleanup procedure.
 - Y - The calibration verification for this analyte exceeded the 20% drift specified in method 8260C, and therefore the reported result should be considered an estimate. The overall performance of the calibration verification standard met the acceptance criteria of the method.
 - Z -
- ND - Not Detected at PQL
 PQL - Practical Quantitation Limit
 RPD - Relative Percent Difference





Am Test Inc.
13600 NE 126TH PL
Suite C
Kirkland, WA 98034
(425) 885-1664

**Professional
Analytical
Services**

Mar 14 2018
On-Site Environmental
14648 NE 95th ST
Redmond, WA 98052
Attention: David Baumeister

Dear David Baumeister:

Enclosed please find the analytical data for your REDMOND PAIRED WATERSHED STUDY project.

The following is a cross correlation of client and laboratory identifications for your convenience.

| CLIENT ID | MATRIX | AMTEST ID | TEST |
|-----------------|--------|------------|------------|
| COLM-20180228 | Water | 18-A003487 | Micro, NUT |
| COLUMI-20180228 | Water | 18-A003488 | Micro, NUT |
| COUMO-20180228 | Water | 18-A003489 | Micro, NUT |
| EVAMS-20180228 | Water | 18-A003490 | Micro, NUT |
| EVALSS-20180228 | Water | 18-A003491 | Micro, NUT |
| MONMN-20180228 | Water | 18-A003492 | Micro, NUT |
| MONMS-20180228 | Water | 18-A003493 | Micro, NUT |
| MONM-20180228 | Water | 18-A003494 | Micro, NUT |
| SEIMN-20180228 | Water | 18-A003495 | Micro, NUT |
| SEIMS-20180228 | Water | 18-A003496 | Micro, NUT |
| TOSMI-20180228 | Water | 18-A003497 | Micro, NUT |
| TOSMO-20180228 | Water | 18-A003498 | Micro, NUT |
| TYLMI-20180228 | Water | 18-A003499 | Micro, NUT |
| TYLMO-20180228 | Water | 18-A003500 | Micro, NUT |
| QA46-20180228 | Water | 18-A003501 | Micro, NUT |

Your samples were received on Thursday, March 1, 2018. At the time of receipt, the samples were logged in and properly maintained prior to the subsequent analysis.

The analytical procedures used at AmTest are well documented and are typically derived from the protocols of the EPA, USDA, FDA or the Army Corps of Engineers.

Following the analytical data you will find the Quality Control (QC) results.

Please note that the detection limits that are listed in the body of the report refer to the Practical Quantitation Limits (PQL's), as opposed to the Method Detection Limits (MDL's).

Am Test Inc.
13600 NE 126TH PL
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Kirkland, WA 98034
(425) 885-1664

**Professional
Analytical
Services**

Mar 14 2018
On-Site Environmental
continued . . .

If you should have any questions pertaining to the data package, please feel free to contact me.

Sincerely,


Aaron W. Young
Laboratory Manager

Project #: 14-05806-000
PO Number: 02-298

BACT = Bacteriological
CONV = Conventional

MET = Metals
ORG = Organics

NUT=Nutrients
DEM=Demand

MIN=Minerals

Am Test Inc.
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www.amtestlab.com



*Professional
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Services*

ANALYSIS REPORT

On-Site Environmental
14648 NE 95th ST
Redmond, WA 98052
Attention: David Baumeister
Project Name: REDMOND PAIRED WATERSHED STUDY
Project #: 14-05806-000
PO Number: 02-298
All results reported on an as received basis.

Date Received: 03/01/18
Date Reported: 3/14/18

AMTEST Identification Number 18-A003487
Client Identification COLM-20180228
Sampling Date 02/28/18, 20:05

Results

| PARAMETER | RESULT | UNITS | Q | D.L. | METHOD | ANALYST | DATE |
|--------------------------|--------|------------|---|------|-----------|---------|----------|
| Fecal Coliform | 50. | CFU/100 ml | | 1 | SM 9222D | JM | 03/01/18 |
| Total Nitrogen (NOX&TKN) | 0.41 | mg/l | | 0.1 | | | |
| Total Nitrogen (TKN) | 0.345 | mg/l | | 0.1 | SM4500N | JC | 03/09/18 |
| Nitrate + Nitrite | 0.062 | mg/l | | 0.01 | SM4500NO3 | JC | 03/14/18 |

AMTEST Identification Number **18-A003488**
Client Identification **COUMI-20180228**
Sampling Date **02/28/18, 17:10**

Results

| PARAMETER | RESULT | UNITS | Q | D.L. | METHOD | ANALYST | DATE |
|--------------------------|--------|------------|---|------|-----------|---------|----------|
| Fecal Coliform | 98. | CFU/100 ml | | 1 | SM 9222D | JM | 03/01/18 |
| Total Nitrogen (NOX&TKN) | 0.72 | mg/l | | 0.1 | | | |
| Total Nitrogen (TKN) | 0.454 | mg/l | | 0.1 | SM4500N | JC | 03/09/18 |
| Nitrate + Nitrite | 0.27 | mg/l | | 0.01 | SM4500NO3 | JC | 03/14/18 |

AMTEST Identification Number **18-A003489**
Client Identification **COUMO-20180228**
Sampling Date **02/28/18, 16:40**

Results

| PARAMETER | RESULT | UNITS | Q | D.L. | METHOD | ANALYST | DATE |
|--------------------------|--------|------------|---|------|-----------|---------|----------|
| Fecal Coliform | 56. | CFU/100 ml | | 1 | SM 9222D | JM | 03/01/18 |
| Total Nitrogen (NOX&TKN) | 0.89 | mg/l | | 0.1 | | | |
| Total Nitrogen (TKN) | 0.488 | mg/l | | 0.1 | SM4500N | JC | 03/09/18 |
| Nitrate + Nitrite | 0.40 | mg/l | | 0.01 | SM4500NO3 | JC | 03/14/18 |

AMTEST Identification Number **18-A003490**
Client Identification **EVAMS-20180228**
Sampling Date **02/28/18, 17:50**

Results

| PARAMETER | RESULT | UNITS | Q | D.L. | METHOD | ANALYST | DATE |
|--------------------------|--------|------------|---|------|-----------|---------|----------|
| Fecal Coliform | 2. | CFU/100 ml | | 1 | SM 9222D | JM | 03/01/18 |
| Total Nitrogen (NOX&TKN) | 2.23 | mg/l | | 0.1 | | | |
| Total Nitrogen (TKN) | 0.430 | mg/l | | 0.1 | SM4500N | JC | 03/09/18 |
| Nitrate + Nitrite | 1.8 | mg/l | | 0.01 | SM4500NO3 | JC | 03/14/18 |

AMTEST Identification Number **18-A003491**
Client Identification **EVALSS-20180228**
Sampling Date **02/28/18, 18:10**

Results

| PARAMETER | RESULT | UNITS | Q | D.L. | METHOD | ANALYST | DATE |
|--------------------------|--------|------------|---|------|-----------|---------|----------|
| Fecal Coliform | 46. | CFU/100 ml | | 1 | SM 9222D | JM | 03/01/18 |
| Total Nitrogen (NOX&TKN) | 1.87 | mg/l | | 0.1 | | | |
| Total Nitrogen (TKN) | 0.367 | mg/l | | 0.1 | SM4500N | JC | 03/09/18 |
| Nitrate + Nitrite | 1.5 | mg/l | | 0.01 | SM4500NO3 | JC | 03/14/18 |

AMTEST Identification Number **18-A003492**
Client Identification **MONMN-20180228**
Sampling Date **02/28/18, 19:50**

Results

| PARAMETER | RESULT | UNITS | Q | D.L. | METHOD | ANALYST | DATE |
|--------------------------|--------|------------|---|------|-----------|---------|----------|
| Fecal Coliform | 6. | CFU/100 ml | | 1 | SM 9222D | JM | 03/01/18 |
| Total Nitrogen (NOX&TKN) | 0.51 | mg/l | | 0.1 | | | |
| Total Nitrogen (TKN) | 0.277 | mg/l | | 0.1 | SM4500N | JC | 03/09/18 |
| Nitrate + Nitrite | 0.23 | mg/l | | 0.01 | SM4500NO3 | JC | 03/14/18 |

AMTEST Identification Number **18-A003493**
Client Identification **MONMS-20180228**
Sampling Date **02/28/18, 20:10**

Results

| PARAMETER | RESULT | UNITS | Q | D.L. | METHOD | ANALYST | DATE |
|--------------------------|--------|------------|---|------|-----------|---------|----------|
| Fecal Coliform | 88. | CFU/100 ml | | 1 | SM 9222D | JM | 03/01/18 |
| Total Nitrogen (NOX&TKN) | 0.94 | mg/l | | 0.1 | | | |
| Total Nitrogen (TKN) | 0.461 | mg/l | | 0.1 | SM4500N | JC | 03/09/18 |
| Nitrate + Nitrite | 0.48 | mg/l | | 0.01 | SM4500NO3 | JC | 03/14/18 |

AMTEST Identification Number **18-A003494**
Client Identification **MONM-20180228**
Sampling Date **02/28/18, 20:55**

Results

| PARAMETER | RESULT | UNITS | Q | D.L. | METHOD | ANALYST | DATE |
|--------------------------|--------|------------|---|------|-----------|---------|----------|
| Fecal Coliform | 12. | CFU/100 ml | | 1 | SM 9222D | JM | 03/01/18 |
| Total Nitrogen (NOX&TKN) | 0.73 | mg/l | | 0.1 | | | |
| Total Nitrogen (TKN) | 0.368 | mg/l | | 0.1 | SM4500N | JC | 03/09/18 |
| Nitrate + Nitrite | 0.36 | mg/l | | 0.01 | SM4500NO3 | JC | 03/14/18 |

AMTEST Identification Number **18-A003495**
Client Identification **SEIMN-20180228**
Sampling Date **02/28/18, 19:10**

Results

| PARAMETER | RESULT | UNITS | Q | D.L. | METHOD | ANALYST | DATE |
|--------------------------|--------|------------|---|------|-----------|---------|----------|
| Fecal Coliform | < 2 | CFU/100 ml | | 1 | SM 9222D | JM | 03/01/18 |
| Total Nitrogen (NOX&TKN) | 0.59 | mg/l | | 0.1 | | | |
| Total Nitrogen (TKN) | 0.422 | mg/l | | 0.1 | SM4500N | JC | 03/09/18 |
| Nitrate + Nitrite | 0.17 | mg/l | | 0.01 | SM4500NO3 | JC | 03/14/18 |

AMTEST Identification Number 18-A003496
Client Identification SEIMS-20180228
Sampling Date 02/28/18, 21:00

Results

| PARAMETER | RESULT | UNITS | Q | D.L. | METHOD | ANALYST | DATE |
|--------------------------|--------|------------|---|------|-----------|---------|----------|
| Fecal Coliform | 44. | CFU/100 ml | | 1 | SM 9222D | JM | 03/01/18 |
| Total Nitrogen (NOX&TKN) | 0.72 | mg/l | | 0.1 | | | |
| Total Nitrogen (TKN) | 0.486 | mg/l | | 0.1 | SM4500N | JC | 03/09/18 |
| Nitrate + Nitrite | 0.23 | mg/l | | 0.01 | SM4500NO3 | JC | 03/14/18 |

AMTEST Identification Number 18-A003497
Client Identification TOSMI-20180228
Sampling Date 02/28/18, 16:40

Results

| PARAMETER | RESULT | UNITS | Q | D.L. | METHOD | ANALYST | DATE |
|--------------------------|--------|------------|---|------|-----------|---------|----------|
| Fecal Coliform | 98. | CFU/100 ml | | 1 | SM 9222D | JM | 03/01/18 |
| Total Nitrogen (NOX&TKN) | 1.00 | mg/l | | 0.1 | | | |
| Total Nitrogen (TKN) | 0.556 | mg/l | | 0.1 | SM4500N | JC | 03/09/18 |
| Nitrate + Nitrite | 0.44 | mg/l | | 0.01 | SM4500NO3 | JC | 03/14/18 |

AMTEST Identification Number 18-A003498
Client Identification TOSMO-20180228
Sampling Date 02/28/18, 17:50

Results

| PARAMETER | RESULT | UNITS | Q | D.L. | METHOD | ANALYST | DATE |
|--------------------------|--------|------------|---|------|-----------|---------|----------|
| Fecal Coliform | 120 | CFU/100 ml | | 1 | SM 9222D | JM | 03/01/18 |
| Total Nitrogen (NOX&TKN) | 1.14 | mg/l | | 0.1 | | | |
| Total Nitrogen (TKN) | 0.739 | mg/l | | 0.1 | SM4500N | JC | 03/09/18 |
| Nitrate + Nitrite | 0.40 | mg/l | | 0.01 | SM4500NO3 | JC | 03/14/18 |

AMTEST Identification Number 18-A003499
Client Identification TYLMI-20180228
Sampling Date 02/28/18, 19:15

Results

| PARAMETER | RESULT | UNITS | Q | D.L. | METHOD | ANALYST | DATE |
|--------------------------|--------|------------|---|------|-----------|---------|----------|
| Fecal Coliform | 22. | CFU/100 ml | | 1 | SM 9222D | JM | 03/01/18 |
| Total Nitrogen (NOX&TKN) | 0.89 | mg/l | | 0.1 | | | |
| Total Nitrogen (TKN) | 0.411 | mg/l | | 0.1 | SM4500N | JC | 03/09/18 |
| Nitrate + Nitrite | 0.48 | mg/l | | 0.01 | SM4500NO3 | JC | 03/14/18 |

AMTEST Identification Number **18-A003500**
Client Identification **TYLMO-20180228**
Sampling Date **02/28/18, 18:40**


Results

| PARAMETER | RESULT | UNITS | Q | D.L. | METHOD | ANALYST | DATE |
|--------------------------|--------|------------|---|------|-----------|---------|----------|
| Fecal Coliform | 140 | CFU/100 ml | | 1 | SM 9222D | JM | 03/01/18 |
| Total Nitrogen (NOX&TKN) | 1.74 | mg/l | | 0.1 | | | |
| Total Nitrogen (TKN) | 1.40 | mg/l | | 0.1 | SM4500N | JC | 03/09/18 |
| Nitrate + Nitrite | 0.34 | mg/l | | 0.01 | SM4500NO3 | JC | 03/14/18 |

AMTEST Identification Number **18-A003501**
Client Identification **QA46-20180228**
Sampling Date **02/28/18, 17:50**

Results

| PARAMETER | RESULT | UNITS | Q | D.L. | METHOD | ANALYST | DATE |
|--------------------------|--------|------------|---|------|-----------|---------|----------|
| Fecal Coliform | 140 | CFU/100 ml | | 1 | SM 9222D | JM | 03/01/18 |
| Total Nitrogen (NOX&TKN) | 0.89 | mg/l | | 0.1 | | | |
| Total Nitrogen (TKN) | 0.493 | mg/l | | 0.1 | SM4500N | JC | 03/09/18 |
| Nitrate + Nitrite | 0.40 | mg/l | | 0.01 | SM4500NO3 | JC | 03/14/18 |


Aaron W. Young
Laboratory Manager

QC Summary for sample numbers: 18-A003487 to 18-A003501

DUPLICATES

| SAMPLE # | ANALYTE | UNITS | SAMPLE VALUE | DUP VALUE | RPD |
|------------|----------------------|------------|--------------|-----------|------|
| 18-A003487 | Fecal Coliform | CFU/100 ml | 50. | 58. | 15. |
| 18-A003501 | Fecal Coliform | CFU/100 ml | 140 | 170 | 19. |
| 18-A003486 | Total Nitrogen (TKN) | mg/l | 2.66 | 2.49 | 6.6 |
| 18-A003499 | Total Nitrogen (TKN) | mg/l | 0.411 | 0.418 | 1.7 |
| 18-A003486 | Nitrate + Nitrite | mg/l | 1.9 | 1.9 | 0.00 |
| 18-A003498 | Nitrate + Nitrite | mg/l | 0.40 | 0.39 | 2.5 |
| 18-A003554 | Nitrate + Nitrite | mg/l | 0.046 | 0.041 | 11. |
| 18-A003711 | Nitrate + Nitrite | mg/l | 1.8 | 1.8 | 0.00 |
| 18-A003721 | Nitrate + Nitrite | mg/l | 2.1 | 2.2 | 4.7 |
| 18-A003823 | Nitrate + Nitrite | mg/l | 0.51 | 0.51 | 0.00 |
| 18-A003929 | Nitrate + Nitrite | mg/l | 1.5 | 1.5 | 0.00 |
| 18-A003939 | Nitrate + Nitrite | mg/l | 0.27 | 0.26 | 3.8 |
| 18-A004227 | Nitrate + Nitrite | mg/l | 0.91 | 0.92 | 1.1 |
| 18-A004252 | Nitrate + Nitrite | mg/l | 0.67 | 0.69 | 2.9 |

MATRIX SPIKES

| SAMPLE # | ANALYTE | UNITS | SAMPLE VALUE | SMPL+ SPK | SPK AMT | RECOVERY |
|------------|----------------------|-------|--------------|-----------|---------|----------|
| 18-A003486 | Total Nitrogen (TKN) | mg/l | 2.66 | 6.63 | 4.00 | 99.25 % |
| 18-A003499 | Total Nitrogen (TKN) | mg/l | 0.411 | 1.28 | 1.00 | 86.90 % |
| 18-A003486 | Nitrate + Nitrite | mg/l | 1.9 | 6.5 | 5.0 | 92.00 % |
| 18-A003498 | Nitrate + Nitrite | mg/l | 0.40 | 1.3 | 1.0 | 90.00 % |
| 18-A003554 | Nitrate + Nitrite | mg/l | 0.046 | 0.99 | 1.0 | 94.40 % |
| 18-A003711 | Nitrate + Nitrite | mg/l | 1.8 | 6.5 | 5.0 | 94.00 % |
| 18-A003721 | Nitrate + Nitrite | mg/l | 2.1 | 6.8 | 5.0 | 94.00 % |
| 18-A003823 | Nitrate + Nitrite | mg/l | 0.51 | 1.4 | 1.0 | 89.00 % |
| 18-A003929 | Nitrate + Nitrite | mg/l | 1.5 | 6.3 | 5.0 | 96.00 % |
| 18-A003939 | Nitrate + Nitrite | mg/l | 0.27 | 1.2 | 1.0 | 93.00 % |
| 18-A004227 | Nitrate + Nitrite | mg/l | 0.91 | 2.0 | 1.0 | 109.00 % |
| 18-A004252 | Nitrate + Nitrite | mg/l | 0.67 | 1.7 | 1.0 | 103.00 % |

STANDARD REFERENCE MATERIALS

| ANALYTE | UNITS | TRUE VALUE | MEASURED VALUE | RECOVERY |
|----------------------|-------|------------|----------------|----------|
| Total Nitrogen (TKN) | mg/l | 1.00 | 1.02 | 102. % |
| Total Nitrogen (TKN) | mg/l | 1.00 | 1.01 | 101. % |
| Total Nitrogen (TKN) | mg/l | 1.00 | 0.995 | 99.5 % |
| Nitrate + Nitrite | mg/l | 1.0 | 0.97 | 97.0 % |
| Nitrate + Nitrite | mg/l | 1.0 | 0.97 | 97.0 % |
| Nitrate + Nitrite | mg/l | 1.0 | 0.97 | 97.0 % |

QC Summary for sample numbers: 18-A003487 to 18-A003501...

STANDARD REFERENCE MATERIALS continued....

| ANALYTE | UNITS | TRUE VALUE | MEASURED VALUE | RECOVERY |
|-------------------|-------|------------|----------------|----------|
| Nitrate + Nitrite | mg/l | 0.50 | 0.50 | 100. % |
| Nitrate + Nitrite | mg/l | 1.0 | 0.95 | 95.0 % |
| Nitrate + Nitrite | mg/l | 1.0 | 0.94 | 94.0 % |
| Nitrate + Nitrite | mg/l | 0.50 | 0.50 | 100. % |
| Nitrate + Nitrite | mg/l | 1.0 | 0.95 | 95.0 % |
| Nitrate + Nitrite | mg/l | 1.0 | 0.97 | 97.0 % |
| Nitrate + Nitrite | mg/l | 0.50 | 0.50 | 100. % |
| Nitrate + Nitrite | mg/l | 1.0 | 0.96 | 96.0 % |
| Nitrate + Nitrite | mg/l | 1.0 | 0.96 | 96.0 % |
| Nitrate + Nitrite | mg/l | 0.50 | 0.50 | 100. % |
| Nitrate + Nitrite | mg/l | 1.0 | 0.95 | 95.0 % |
| Nitrate + Nitrite | mg/l | 1.0 | 1.0 | 100. % |
| Nitrate + Nitrite | mg/l | 0.50 | 0.50 | 100. % |
| Nitrate + Nitrite | mg/l | 1.0 | 0.95 | 95.0 % |
| Nitrate + Nitrite | mg/l | 0.50 | 0.49 | 98.0 % |

BLANKS

| ANALYTE | UNITS | RESULT |
|----------------------|------------|--------|
| Fecal Coliform | CFU/100 ml | < 1 |
| Fecal Coliform | CFU/100 ml | < 1 |
| Total Nitrogen (TKN) | mg/l | < 0.1 |
| Total Nitrogen (TKN) | mg/l | < 0.1 |
| Total Nitrogen (TKN) | mg/l | < 0.1 |
| Nitrate + Nitrite | mg/l | < 0.01 |
| Nitrate + Nitrite | mg/l | < 0.01 |
| Nitrate + Nitrite | mg/l | < 0.01 |
| Nitrate + Nitrite | mg/l | 0.002 |
| Nitrate + Nitrite | mg/l | < 0.01 |
| Nitrate + Nitrite | mg/l | < 0.01 |
| Nitrate + Nitrite | mg/l | -0.002 |
| Nitrate + Nitrite | mg/l | < 0.01 |
| Nitrate + Nitrite | mg/l | < 0.01 |
| Nitrate + Nitrite | mg/l | -0.002 |
| Nitrate + Nitrite | mg/l | < 0.01 |
| Nitrate + Nitrite | mg/l | < 0.01 |
| Nitrate + Nitrite | mg/l | -0.003 |
| Nitrate + Nitrite | mg/l | < 0.01 |
| Nitrate + Nitrite | mg/l | < 0.01 |
| Nitrate + Nitrite | mg/l | -0.006 |
| Nitrate + Nitrite | mg/l | < 0.01 |
| Nitrate + Nitrite | mg/l | -0.003 |



14648 NE 95th Street, Redmond, WA 98052 · (425) 883-3881

Laboratory: AmTest Laboratories

Attention: Aaron Young

13600 NE 126th PI Kirkland, WA 98034

Phone Number: (425) 885-1664

Turnaround Request

1 Day 2 Day 3 Day

Standard

Other: _____

Laboratory Reference #: 02-298

Project Manager: Blair Goodrow

email: bgoodrow@onsite-env.com

Project Number: 14-05806-000

Project Name: Redmond Paired Watershed Study

| Lab ID | Sample Identification | Date Sampled | Time Sampled | Matrix | # of Cont. | Requested Analyses |
|------------------|-----------------------|--------------|--------------|--------|------------|--|
| 1 | COLM-20180228 3487 | 2/28/18 | 20:05 | Water | 2 | Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N |
| 2 | COUMI-20180228 88 | 2/28/18 | 17:10 | Water | 2 | Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N |
| 3 | COUMO-20180228 89 | 2/28/18 | 16:40 | Water | 2 | Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N |
| 4 | EVAMS-20180228 90 | 2/28/18 | 17:50 | Water | 2 | Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N |
| 5 | EVALSS-20180228 91 | 2/28/18 | 18:10 | Water | 2 | Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N |
| 6 | MONMN-20180228 92 | 2/28/18 | 19:50 | Water | 2 | Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N |
| 7 | MONMS-20180228 93 | 2/28/18 | 20:10 | Water | 2 | Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N |
| 8 | MONM-20180228 94 | 2/28/18 | 20:55 | Water | 2 | Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N |
| 9 | SEIMN-20180228 95 | 2/28/18 | 19:10 | Water | 2 | Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N |
| 10 | SEIMS-20180228 96 | 2/28/18 | 21:00 | Water | 2 | Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N |
| Signature | | Company | | Date | Time | Comments/Special Instructions |
| Relinquished by: | | OnSite Env | | 3/1/18 | 1155 | EDDs - CSV Reporting Limits: Fecal Coliform - 1.0 cfu/100ml Total Nitrogen - .10 mg/L |
| Received by: | | T=3.8 | | 3/1/18 | 1155 | |
| Relinquished by: | | | | | | |
| Received by: | | | | | | |
| Relinquished by: | | | | | | |
| Received by: | | | | | | |

shelf 7



14648 NE 95th Street, Redmond, WA 98052 · (425) 883-3881

Laboratory: AmTest Laboratories

Attention: Aaron Young

13600 NE 126th PI Kirkland, WA 98034

Phone Number: (425) 885-1664

Turnaround Request

1 Day 2 Day 3 Day

Standard

Other: _____

Laboratory Reference #: 02-298

Project Manager: Blair Goodrow

email: bgoodrow@onsite-env.com

Project Number: 14-05806-000

Project Name: Redmond Paired Watershed Study

| Lab ID | Sample Identification | Date Sampled | Time Sampled | Matrix | # of Cont. | Requested Analyses |
|--------|-----------------------|--------------|--------------|--------|------------|---|
| 11 | TOSMI-20180228 3497 | 2/28/18 | 16:40 | Water | 2 | Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N |
| 12 | TOSMO-20180228 98 | 2/28/18 | 17:50 | Water | 2 | Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N |
| 13 | TYLMI-20180228 99 | 2/28/18 | 19:15 | Water | 2 | Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N |
| 14 | TYLMO-20180228 3500 | 2/28/18 | 18:40 | Water | 2 | Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N |
| 15 | QA46-20180228 01 | 2/28/18 | 17:50 | Water | 2 | Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |

| Signature | Company | Date | Time | Comments/Special Instructions |
|------------------|------------|--------|------|--|
| Relinquished by: | OnSite Env | 3/1/18 | 1155 | EDDs - CSV Reporting Limits: Fecal Coliform - 1.0 cfu/100ml Total Nitrogen - .10 mg/L |
| Received by: | T=3.8 | 3/1/18 | 1155 | |
| Relinquished by: | | | | |
| Received by: | | | | |
| Relinquished by: | | | | |
| Received by: | | | | |



14648 NE 95th Street, Redmond, WA 98052
Telephone: 425.883.3881

Company: Herrera Environmental Consultants
Project No.: 14-05806-000
Project Name: Redmond Paired Watershed Study
Project Manager: George Iftner

CHAIN OF CUSTODY

Turnaround Requested:

1 Day

2 Day

3 Day

Standard

Laboratory No. **02-298**

Requested Analyses

| Total Suspended Solids (SM 2540D) | Turbidity (EPA 181.1) | Hardness (EPA 200.7 / SM 2340B) | Dissolved Organ Carbon (SM 5310B) * | Fecal Coliform (SM 9222D) | Total Phosphorus (EPA 365.1) | Total Nitrogen (SM 4500 N-B) | Total Cu and Zn (EPA 200.8) | Dissolved Cu and Zn (EPA 200.8) * |
|-----------------------------------|-----------------------|---------------------------------|-------------------------------------|---------------------------|------------------------------|------------------------------|-----------------------------|-----------------------------------|
|-----------------------------------|-----------------------|---------------------------------|-------------------------------------|---------------------------|------------------------------|------------------------------|-----------------------------|-----------------------------------|

| Lab ID | Sample Identification | Date Sampled | Time Sampled | Matrix | # of Cont. | Total Suspended Solids (SM 2540D) | Turbidity (EPA 181.1) | Hardness (EPA 200.7 / SM 2340B) | Dissolved Organ Carbon (SM 5310B) * | Fecal Coliform (SM 9222D) | Total Phosphorus (EPA 365.1) | Total Nitrogen (SM 4500 N-B) | Total Cu and Zn (EPA 200.8) | Dissolved Cu and Zn (EPA 200.8) * |
|--------|-----------------------|--------------|--------------|--------|------------|-----------------------------------|-----------------------|---------------------------------|-------------------------------------|---------------------------|------------------------------|------------------------------|-----------------------------|-----------------------------------|
| 1 | COLM-2018 -0228 | 2/28/18 | 20:05 | Water | 7 | X | X | X | X | X | X | X | X | X |
| 2 | COUMI-2018 -0228 | 2/28/18 | 17:10 | Water | 7 | X | X | X | X | X | X | X | X | X |
| 3 | COUMO-2018 -0228 | 2/28/18 | 16:40 | Water | 7 | X | X | X | X | X | X | X | X | X |
| 4 | EVAMS-2018 -0228 | 2/28/18 | 17:50 | Water | 7 | X | X | X | X | X | X | X | X | X |
| 5 | EVALSS-2018 -0228 | 2/28/18 | 18:10 | Water | 7 | X | X | X | X | X | X | X | X | X |
| 6 | MONMN-2018 -0228 | 2/28/18 | 19:50 | Water | 7 | X | X | X | X | X | X | X | X | X |
| 7 | MONMS-2018 -0228 | 2/28/18 | 20:10 | Water | 7 | X | X | X | X | X | X | X | X | X |
| 8 | MONM-2018 -0228 | 2/28/18 | 20:55 | Water | 7 | X | X | X | X | X | X | X | X | X |
| 9 | SEIMN-2018 -0228 | 2/28/18 | 19:10 | Water | 7 | X | X | X | X | X | X | X | X | X |
| 10 | SEIMS-2018 -0228 | 2/28/18 | 21:00 | Water | 7 | X | X | X | X | X | X | X | X | X |
| 11 | TOSMI-2018 -0228 | 2/28/18 | 16:40 | Water | 7 | X | X | X | X | X | X | X | X | X |
| 12 | TOSMO-2018 -0228 | 2/28/18 | 17:50 | Water | 7 | X | X | X | X | X | X | X | X | X |
| 13 | TYLMI-2018 -0228 | 2/28/18 | 19:15 | Water | 7 | X | X | X | X | X | X | X | X | X |
| 14 | TYLMO-2018 -0228 | 2/28/18 | 18:40 | Water | 7 | X | X | X | X | X | X | X | X | X |
| 15 | QA46-2018-0228 | 2/28/18 | 17:50 | Water | 7 | X | X | X | X | X | X | X | X | X |

Relinquished by Meghan Mullen Date 2.29.18 Received by [Signature] Date 2/28/18

Firm Herrera Time 21:50 Firm OnSite Env Time 21:50

Relinquished by _____ Date _____ Received by _____ Date _____

Firm _____ Time _____ Firm _____ Time _____

Comments:
* - field filtered with 0.45 µm filter within 15 minutes of collecting sample



14648 NE 95th Street, Redmond, WA 98052
 Telephone: 425.883.3881

Company: Herrera Environmental Consultants
 Project No.: 14-05806-000
 Project Name: Redmond Paired Watershed Study
 Project Manager: George Ittner

CHAIN OF CUSTODY

Turnaround Requested:

- 1 Day
- 2 Day
- 3 Day
- Standard

Laboratory No.

02-298

Requested Analyses

| | | | | | | | | | | | | | | | | | | |
|-----------------------------------|-----------------------|---------------------------------|-------------------------------------|---------------------------|------------------------------|------------------------------|-----------------------------|-----------------------------------|--|--|--|--|--|--|--|--|--|--|
| Total Suspended Solids (SM 2540D) | Turbidity (EPA 181.1) | Hardness (EPA 200.7 / SM 2340B) | Dissolved Organ Carbon (SM 5310B) * | Fecal Coliform (SM 9222D) | Total Phosphorus (EPA 365.1) | Total Nitrogen (SM 4500 N-B) | Total Cu and Zn (EPA 200.8) | Dissolved Cu and Zn (EPA 200.8) * | | | | | | | | | | |
|-----------------------------------|-----------------------|---------------------------------|-------------------------------------|---------------------------|------------------------------|------------------------------|-----------------------------|-----------------------------------|--|--|--|--|--|--|--|--|--|--|

| Lab ID | Sample Identification | Date Sampled | Time Sampled | Matrix | # of Cont. | Total Suspended Solids (SM 2540D) | Turbidity (EPA 181.1) | Hardness (EPA 200.7 / SM 2340B) | Dissolved Organ Carbon (SM 5310B) * | Fecal Coliform (SM 9222D) | Total Phosphorus (EPA 365.1) | Total Nitrogen (SM 4500 N-B) | Total Cu and Zn (EPA 200.8) | Dissolved Cu and Zn (EPA 200.8) * | | | | |
|--------|-----------------------|--------------|--------------|--------|------------|-----------------------------------|-----------------------|---------------------------------|-------------------------------------|---------------------------|------------------------------|------------------------------|-----------------------------|-----------------------------------|--|--|--|--|
| 1 | COLM-2018 -0228 | 2/28/18 | 20:05 | Water | 7 | X | X | X | X | X | X | X | X | X | | | | |
| 2 | COUMI-2018 -0228 | 2/28/18 | 17:10 | Water | 7 | X | X | X | X | X | X | X | X | X | | | | |
| 3 | COUMO-2018 -0228 | 2/28/18 | 16:40 | Water | 7 | X | X | X | X | X | X | X | X | X | | | | |
| 4 | EVAMS-2018 -0228 | 2/28/18 | 17:50 | Water | 7 | X | X | X | X | X | X | X | X | X | | | | |
| 5 | EVALSS-2018 -0228 | 2/28/18 | 18:10 | Water | 7 | X | X | X | X | X | X | X | X | X | | | | |
| 6 | MONMN-2018 -0228 | 2/28/18 | 19:50 | Water | 7 | X | X | X | X | X | X | X | X | X | | | | |
| 7 | MONMS-2018 -0228 | 2/28/18 | 20:10 | Water | 7 | X | X | X | X | X | X | X | X | X | | | | |
| 8 | MONM-2018 -0228 | 2/28/18 | 20:55 | Water | 7 | X | X | X | X | X | X | X | X | X | | | | |
| 9 | SEIMN-2018 -0228 | 2/28/18 | 19:10 | Water | 7 | X | X | X | X | X | X | X | X | X | | | | |
| 10 | SEIMS-2018 -0228 | 2/28/18 | 21:00 | Water | 7 | X | X | X | X | X | X | X | X | X | | | | |
| 11 | TOSMI-2018 -0228 | 2/28/18 | 16:40 | Water | 7 | X | X | X | X | X | X | X | X | X | | | | |
| 12 | TOSMO-2018 -0228 | 2/28/18 | 17:50 | Water | 7 | X | X | X | X | X | X | X | X | X | | | | |
| 13 | TYLMI-2018 -0228 | 2/28/18 | 19:15 | Water | 7 | X | X | X | X | X | X | X | X | X | | | | |
| 14 | TYLMO-2018 -0228 | 2/28/18 | 18:40 | Water | 7 | X | X | X | X | X | X | X | X | X | | | | |
| 15 | QA46-2018 -0228 | 2/28/18 | 17:50 | Water | 7 | X | X | X | X | X | X | X | X | X | | | | |

Relinquished by Meghan Mullen Date 2.29.18 Received by [Signature] Date 2/28/18
 Firm Herrera Time 21:50 Firm [Signature] Time 21:50

Relinquished by _____ Date _____ Received by _____ Date _____
 Firm _____ Time _____ Firm _____ Time _____

Comments:
 * - field filtered with 0.45 µm filter within 15 minutes of collecting sample

METER CALIBRATION LOG - Redmond Paired Watershed Study

Project Number: 14-05806-000
Personnel Performing Calibration: M Mullen
Meter: PRODS #2
Date/Time: 2-28-18 15:00
Barometric Pressure Start of Day: mmHg: 750.4 Time: 15:00
Barometric Pressure End of Day: mmHg: 748.6 Time: 10:00

Calibration Procedures:
Rinse Multimeter Sonde Between Each Operation
 Rinse 3 times with tap water, 3 times with deionized water, then 3 times with the solution to be used for calibrating or testing.



- Conductivity Calibration Notes:**
1. Dry the conductivity probe with a lab tissue (e.g., KimWipes®) and DI water.
 2. Fill calibration cup to within a centimeter of the top of the calibration cup with DI water (0 µS).
 3. Fill the calibration cup with 1,000 µS standard so that the temperature/conductivity probe is submerged.
 4. Make sure there are no bubbles in the cell; wait 2 minutes.
 5. Enter the appropriate standard value (1,000 µS/cm or 1.0 mS/cm) for Sp Cond.
 6. Check conductivity using 100 µS/cm standard.

| PRE Field Run CALIBRATION | Meter Reading | Buffer / Cal Std | Temp °C | Comments |
|---------------------------|---------------|------------------|---------|------------------|
| Conductivity (µS/cm) | 11.3 | 0 | 22.6 | Herrera DI water |
| Conductivity (µS/cm) | 1000 | 1,000 | 23.2 | |
| Conductivity (µS/cm) | 100.7 | 100 | 23.0 | |
| DO % Saturation | 98.7 | 100 | 22.3 | |

- Dissolved Oxygen Calibration Notes:**
1. Fill the calibration cup with about 1/2 inch of DI; it should be below the sensor cap.
 2. Use KimWipes® to dry any droplets from the sensor cap.
 3. Invert calibration cup's cap and gently rest it on the cup.
 4. Wait 5 minutes, making sure that temperature stabilizes.
 5. Determine local barometric pressure (mm Hg) and enter this value into the meter.
 6. Click "Calibrate". "Calibrate Successful" will be displayed.
 7. To retain calibration accuracy between measurements, store with the sensor immersed in water or within a water-saturated air environment such as a sealed storage cup with at least 10 ml of water.
 8. It is important to have the water-saturated air and the sensor at the same temperature. Therefore, store a jar of DI in the same environment as the sonde and calibrate in a similar air temperature as the water and sonde.
 9. Keep probe out of direct sun or wind.

| POST Field Run CHECK | Meter Reading | Buffer / Cal Std | Temp °C | Comments |
|----------------------|---------------|------------------|---------|------------------|
| Conductivity (µS/cm) | 10.6 | 0 | 22.3 | Herrera DI water |
| Conductivity (µS/cm) | 100.5 | 100 | 22.5 | |
| DO % Saturation | 99.1 | 100 | 21.8 | |

METER CALIBRATION LOG - Redmond Paired Watershed Study

Project Number: 14-05806-000
Personnel Performing Calibration: M. Muller
Meter: Pro D55#1
Date/Time: 2-28-16 15:00
Barometric Pressure Start of Day: mmHg: 749.9 Time: 15:00
Barometric Pressure End of Day: mmHg: 748.0 Time: 10:00

Calibration Procedures:

Rinse Multimeter Sonde Between Each Operation

Rinse 3 times with tap water, 3 times with deionized water, then 3 times with the solution to be used for calibrating or testing.

Conductivity Calibration Notes:

1. Dry the conductivity probe with a lab tissue (e.g., KimWipes®) and DI water.
2. Fill calibration cup to within a centimeter of the top of the calibration cup with DI water (0 µS).
3. Fill the calibration cup with 1,000 µS standard so that the temperature/conductivity probe is submerged.
4. Make sure there are no bubbles in the cell; wait 2 minutes.
5. Enter the appropriate standard value (1,000 µS/cm or 1.0 mS/cm) for Sp Cond.
6. Check conductivity using 100 µS/cm standard.

Dissolved Oxygen Calibration Notes:

1. Fill the calibration cup with about 1/2 inch of DI; it should be below the sensor cap.
2. Use KimWipes® to dry any droplets from the sensor cap.
3. Invert calibration cup's cap and gently rest it on the cup.
4. Wait 5 minutes, making sure that temperature stabilizes.
5. Determine local barometric pressure (mm Hg) and enter this value into the meter.
6. Click "Calibrate". "Calibrate Successful" will be displayed.
7. To retain calibration accuracy between measurements, store with the sensor immersed in water or within a water-saturated air environment such as a sealed storage cup with at least 10 ml of water.
8. It is important to have the water-saturated air and the sensor at the same temperature. Therefore, store a jar of DI in the same environment as the sonde and calibrate in a similar air temperature as the water and sonde.
9. Keep probe out of direct sun or wind.



| PRE Field Run CALIBRATION | Meter Reading | Buffer / Cal Std | Temp °C | Comments |
|---------------------------|---------------|------------------|---------|------------------|
| Conductivity (µS/cm) | 11.5 | 0 | 22.4 | Herrera DI Water |
| Conductivity (µS/cm) | 999 | 1,000 | 22.7 | |
| Conductivity (µS/cm) | 101.0 | 100 | 22.6 | |
| DO % Saturation | 100.0 | 100 | 22.3 | |
| POST Field Run CHECK | Meter Reading | Buffer / Cal Std | Temp °C | Comments |
| Conductivity (µS/cm) | 10.3 | 0 | 22.0 | Herrera DI Water |
| Conductivity (µS/cm) | 101.0 | 100 | 21.9 | |
| DO % Saturation | 100.5 | 100 | 21.3 | |

FIELD SAMPLING SHEET - Redmond Paired Watershed Study



Field Personnel: J Goad & G Kayser
 Sample Date: 2018/2/28 Sample Time: 20:05
 Base Flow or Storm Event? (circle) Field Filtered Time: 20:10
(Must filter within 15 minutes of collection)

SITE ID: COLM
 Project Number: 14-05806-000

Water Quality Sampling

Sample ID: COLM-20180228

| Parameter | Bottle Type | Bottle Volume | # Bottles | Preservative | Duplicated? |
|---------------------------|-------------|---------------|-----------|--------------------------------|-------------|
| TSS and Turbidity | HDPE | 1L | 1 | NA | / |
| DOC * | HDPE | 250 ml | 1 | HCL | |
| Fecal Col. Bact. | HDPE | 250 ml | 1 | EDTA | |
| T. Phosphorous | HDPE | 250 ml | 1 | H ₂ SO ₄ | |
| T. Nitrogen | HDPE | 250 ml | 1 | H ₂ SO ₄ | |
| Diss. Cu and Zn * | HDPE | 250 ml | 1 | HNO ₃ | |
| Hardness, Total Cu and Zn | HDPE | 500 ml | 1 | HNO ₃ | |

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID: _____
 Filter blank sample ID: _____
 Transfer blank sample ID: _____

Visual and Olfactory Conditions:

Clarity: clear
 Color: none
 Odor: none
 Sheen: none
 Floatables: none

LABORATORY DELIVERY

Date: _____ Time: _____

Quality Assurance

Checked By: S. Lemish Signature: [Signature]
 Date Checked: 5-23-18 Time: _____
 Data Entered into Database? YES NO initials: _____
 Date Entered: _____ Time: _____
 Notes: _____

Project Name: Redmond Paired Watershed Study
 Current Weather and Temp: 41° rainy

Field Meter Calibration

Check which field meter was used and complete the meter calibration form
 YSI Pro Plus (15D100020) _____
 YSI Pro DSS 1 _____
 YSI Pro DSS 2 _____

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)
 Stream Stage (ft): ~~5.81~~ 5.81
 Reference Point (description): SB

Water Quality Measurements

Temperature (°C) 3.8°
 Specific Conductivity (µs/cm) 26.3
 Dissolved Oxygen (mg/L) 12.15

FIELD SAMPLING SHEET - Redmond Paired Watershed Study



HERRERA

Field Personnel: M Muller

SITE ID: COUM1

Sample Date: 2-28-18 Sample Time: 17:16

PDT: _____

Base Flow or Storm Event? Field Filtered Time: 17:15
(Must filter within 15 minutes of collection)

PST:

Project Number: 14-05806-000

Project Name: Redmond Paired Watershed Study

Current Weather and Temp: rainy 49°F

Water Quality Sampling

Sample ID: COUM1 2018 0228

| Parameter | Bottle Type | Bottle Volume | # Bottles | Preservative | Duplicated? |
|---------------------------|-------------|---------------|-----------|--------------------------------|-------------------------------------|
| TSS and Turbidity | HDPE | 1L | 1 | NA | <input checked="" type="checkbox"/> |
| DOC * | HDPE | 250 ml | 1 | HCL | <input checked="" type="checkbox"/> |
| Fecal Col. Bact. | HDPE | 250 ml | 1 | EDTA | <input checked="" type="checkbox"/> |
| T. Phosphorous | HDPE | 250 ml | 1 | H ₂ SO ₄ | <input checked="" type="checkbox"/> |
| T Nitrogen | HDPE | 250 ml | 1 | H ₂ SO ₄ | <input checked="" type="checkbox"/> |
| Diss. Cu and Zn * | HDPE | 250 ml | 1 | HNO ₃ | <input checked="" type="checkbox"/> |
| Hardness, Total Cu and Zn | HDPE | 500 ml | 1 | HNO ₃ | <input checked="" type="checkbox"/> |

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID: NA
Filter blank sample ID: _____
Transfer blank sample ID: _____

Visual and Olfactory Conditions:

Clarity: some cloudiness
Color: none
Odor: none
Sheen: none
Floatables: some foam

LABORATORY DELIVERY

Date: _____ Time: _____

Quality Assurance

Checked By: J Leuth Signature: [Signature]
Date Checked: 5-23-18 Time: _____
Data Entered into Database? YES NO initials: _____
Date Entered: _____ Time: _____
Notes: _____

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

YSI Pro Plus (15D100020) _____
YSI Pro DSS 1 _____
YSI Pro DSS 2

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): 2.76
Reference Point (description): SG

Water Quality Measurements

Temperature (°C) 6.4
Specific Conductivity (µs/cm) 152.0
Dissolved Oxygen (mg/L) 12.02

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: M. Muller

Sample Date: 2-28-18

Sample Time: 16:40

PDT:

SITE ID: COUMO

Base Flow or Storm Event?

Field Filtered Time: 16:45

PST:

Project Number: 14-05806-000

(Must filter within 15 minutes of collection)



HERRERA

Project Name: Redmond Paired Watershed Study

Water Quality Sampling

Sample ID: COUMO20180228

Current Weather and Temp: rainy, 49°F

| Parameter | Bottle Type | Bottle Volume | # Bottles | Preservative | Duplicated? |
|---------------------------|-------------|---------------|-----------|--------------------------------|-------------|
| TSS and Turbidity | HDPE | 1L | 1 | NA | <u>NO</u> |
| DOC * | HDPE | 250 ml | 1 | HCL | ↓ |
| Fecal Col. Bact. | HDPE | 250 ml | 1 | EDTA | |
| T. Phosphorous | HDPE | 250 ml | 1 | H ₂ SO ₄ | |
| T. Nitrogen | HDPE | 250 ml | 1 | H ₂ SO ₄ | |
| Diss. Cu and Zn * | HDPE | 250 ml | 1 | HNO ₃ | |
| Hardness, Total Cu and Zn | HDPE | 500 ml | 1 | HNO ₃ | |

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID:

Filter blank sample ID:

Transfer blank sample ID:

Visual and Olfactory Conditions:

Clarity: clear
 Color: none
 Odor: none
 Sheen: none
 Floatables: none

LABORATORY DELIVERY

Date:

Time:

Quality Assurance

Checked By: S. Leuth

Signature:

Date Checked: 5-23-18

Time:

Data Entered into Database?

YES

NO

initials:

Date Entered:

Time:

Notes:

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

YSI Pro Plus (15D100020)

YSI Pro DSS 1

YSI Pro DSS 2

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): 1.90

Reference Point (description): SG

Water Quality Measurements

Temperature (°C) 6.7

Specific Conductivity (µs/cm) 212.3

Dissolved Oxygen (mg/L) 11.74

FIELD SAMPLING SHEET - Redmond Paired Watershed Study



HERRERA

Field Personnel: J. Gergel & G. Kayser

Sample Date: 2018/02/28

Sample Time: 17:50

PDT:

SITE ID: EVAMS

Base Flow or Storm Event

Field Filtered Time: 17:55

PST:

Project Number: 14-05806-000

(Must filter within 15 minutes of collection)

Project Name: Redmond Paired Watershed Study

Water Quality Sampling

Sample ID: EVAMS-20180228

Current Weather and Temp: 45° Rainy

| Parameter | Bottle Type | Bottle Volume | # Bottles | Preservative | Duplicated? |
|---------------------------|-------------|---------------|-----------|--------------------------------|-------------|
| TSS and Turbidity | HDPE | 1L | 1 | NA | / |
| DOC * | HDPE | 250 ml | 1 | HCL | |
| Fecal Col. Bact. | HDPE | 250 ml | 1 | EDTA | |
| T. Phosphorous | HDPE | 250 ml | 1 | H ₂ SO ₄ | |
| T Nitrogen | HDPE | 250 ml | 1 | H ₂ SO ₄ | |
| Diss. Cu and Zn * | HDPE | 250 ml | 1 | HNO ₃ | |
| Hardness, Total Cu and Zn | HDPE | 500 ml | 1 | HNO ₃ | |

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID:

Filter blank sample ID:

Transfer blank sample ID:

Visual and Olfactory Conditions:

Clarity: clear
 Color: none
 Odor: none
 Sheen: none
 Floatables: none

LABORATORY DELIVERY

Date:

Time:

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

YSI Pro Plus (15D100020)

YSI Pro DSS 1

YSI Pro DSS 2

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): ~~3.6~~ 3.20

Reference Point (description): SG

Water Quality Measurements

Temperature (°C) 6.0°

Specific Conductivity (µs/cm) 182.9

Dissolved Oxygen (mg/L) 11.83

Quality Assurance

Checked By: T. Lenth

Signature: [Signature]

Date Checked: 5-23-18

Time:

Data Entered into Database?

YES

NO

initials:

Date Entered:

Time:

Notes:

FIELD SAMPLING SHEET - Redmond Paired Watershed Study



HERRERA

Field Personnel: Joseph G + Gretchen K
 Sample Date: 2018-02-28 Sample Time: 18:10
 Base Flow or Storm Event: (circled) Field Filtered Time: 18:15
(Must filter within 15 minutes of collection)

SITE ID: EVALLS
 Project Number: 14-05806-000

Water Quality Sampling

Sample ID: EVALLS-20180228

| Parameter | Bottle Type | Bottle Volume | # Bottles | Preservative | Duplicated? |
|---------------------------|-------------|---------------|-----------|--------------------------------|-------------|
| TSS and Turbidity | HDPE | 1L | 1 | NA | / |
| DOC * | HDPE | 250 ml | 1 | HCL | |
| Fecal Col. Bact. | HDPE | 250 ml | 1 | EDTA | |
| T. Phosphorous | HDPE | 250 ml | 1 | H ₂ SO ₄ | |
| T. Nitrogen | HDPE | 250 ml | 1 | H ₂ SO ₄ | |
| Diss. Cu and Zn * | HDPE | 250 ml | 1 | HNO ₃ | |
| Hardness, Total Cu and Zn | HDPE | 500 ml | 1 | HNO ₃ | |

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID: _____
 Filter blank sample ID: _____
 Transfer blank sample ID: _____

Visual and Olfactory Conditions:

Clarity: clear
 Color: none
 Odor: none
 Sheen: none
 Floatables: none

LABORATORY DELIVERY

Date: _____ Time: _____

Quality Assurance

Checked By: J. Lenth Signature: [Signature]
 Date Checked: 5.23.18 Time: _____
 Data Entered into Database? YES NO initials: _____
 Date Entered: _____ Time: _____
 Notes: _____

Project Name: Redmond Paired Watershed Study

Current Weather and Temp: 45° + Rainy

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

YSI Pro Plus (15D100020) _____
 YSI Pro DSS 1 X _____
 YSI Pro DSS 2 _____

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): 3.50
 Reference Point (description): 56

Water Quality Measurements

Temperature (°C) 6.2°
 Specific Conductivity (µs/cm) 167.7
 Dissolved Oxygen (mg/L) 12.18

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: M Muller

Sample Date: 2.28.18

Sample Time: 19:50

PDT:

SITE ID: MONMN

Base Flow or Storm Event? 0

Field Filtered Time: 19:55

PST:

Project Number: 14-05806-000

(Must filter within 15 minutes of collection)



HERRERA

Project Name: Redmond Paired Watershed Study

Current Weather and Temp: raining 42°F

Water Quality Sampling

Sample ID: MONMN 2018 0228

| Parameter | Bottle Type | Bottle Volume | # Bottles | Preservative | Duplicated? |
|---------------------------|-------------|---------------|-----------|--------------------------------|-------------|
| TSS and Turbidity | HDPE | 1L | 1 | NA | <u>NO</u> |
| DOC * | HDPE | 250 ml | 1 | HCL | <u> </u> |
| Fecal Col. Bact. | HDPE | 250 ml | 1 | EDTA | <u> </u> |
| T. Phosphorous | HDPE | 250 ml | 1 | H ₂ SO ₄ | <u> </u> |
| T. Nitrogen | HDPE | 250 ml | 1 | H ₂ SO ₄ | <u> </u> |
| Diss. Cu and Zn * | HDPE | 250 ml | 1 | HNO ₃ | <u> </u> |
| Hardness, Total Cu and Zn | HDPE | 500 ml | 1 | HNO ₃ | |

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID: NA

Filter blank sample ID: NA

Transfer blank sample ID: NA

Visual and Olfactory Conditions:

Clarity: clear

Color: none

Odor: none

Sheen: none

Floatables: none

LABORATORY DELIVERY

Date: _____ Time: _____

Quality Assurance

Checked By: S. Leuth Signature: [Signature]

Date Checked: 5-23-18 Time: _____

Data Entered into Database? YES NO initials: _____

Date Entered: _____ Time: _____

Notes: _____

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

YSI Pro Plus (15D100020) _____

YSI Pro DSS 1 _____

YSI Pro DSS 2

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): 0.27

Reference Point (description): SG

Water Quality Measurements

Temperature (°C) 5.6

Specific Conductivity (µs/cm) 117.1

Dissolved Oxygen (mg/L) 12.01

FIELD SAMPLING SHEET - Redmond Paired Watershed Study



HERRERA

Field Personnel: M Muller

Sample Date: 2.28.10

Sample Time: 20:10

PDT:

SITE

ID:

MONMS

Base Flow or Storm Event? (S)

Field Filtered Time: 20:15

PST: X

Project Number: 14-05806-000

(Must filter within 15 minutes of collection)

Project Name: Redmond Paired Watershed Study

Water Quality Sampling

Sample ID: MONMS 20180220

| Parameter | Bottle Type | Bottle Volume | # Bottles | Preservative | Duplicated? |
|---------------------------|-------------|---------------|-----------|--------------------------------|-------------|
| TSS and Turbidity | HDPE | 1L | 1 | NA | <u>NO</u> |
| DOC * | HDPE | 250 ml | 1 | HCL | |
| Fecal Col. Bact. | HDPE | 250 ml | 1 | EDTA | |
| T. Phosphorous | HDPE | 250 ml | 1 | H ₂ SO ₄ | |
| T. Nitrogen | HDPE | 250 ml | 1 | H ₂ SO ₄ | |
| Diss. Cu and Zn * | HDPE | 250 ml | 1 | HNO ₃ | |
| Hardness, Total Cu and Zn | HDPE | 500 ml | 1 | HNO ₃ | |

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID: NA

Filter blank sample ID: /

Transfer blank sample ID: /

Visual and Olfactory Conditions:

Clarity: clear
 Color: none
 Odor: none
 Sheen: none
 Floatables: none

LABORATORY DELIVERY

Date:

Time:

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

YSI Pro Plus (15D100020) _____

YSI Pro DSS 1 _____

YSI Pro DSS 2 X

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): 6.71

Reference Point (description):

down from top of PVC pipe

Water Quality Measurements

Temperature (°C) 6.2

Specific Conductivity (µs/cm) 10.57

Dissolved Oxygen (mg/L) 286.8

Quality Assurance

Checked By: E. Lenth

Signature: [Signature]

Date Checked: 5-23-18

Time:

Data Entered into Database?

YES

NO

initials:

Date Entered:

Time:

Notes:

FIELD SAMPLING SHEET - Redmond Paired Watershed Study



HERRERA

Field Personnel: J Greve + G Kayser

Sample Date: 2018/02/28

Sample Time: 20:55

PDT:

SITE ID: MONM

Base Flow or Storm Event? Storm

Field Filtered Time: 21:00

PST:

Project Number: 14-05806-000

(Must filter within 15 minutes of collection)

Project Name: Redmond Paired Watershed Study

Water Quality Sampling

Sample ID: MONM-20180228

| Parameter | Bottle Type | Bottle Volume | # Bottles | Preservative | Duplicated? |
|---------------------------|-------------|---------------|-----------|--------------------------------|-------------|
| TSS and Turbidity | HDPE | 1L | 1 | NA | |
| DOC * | HDPE | 250 ml | 1 | HCL | |
| Fecal Col. Bact. | HDPE | 250 ml | 1 | EDTA | |
| T. Phosphorous | HDPE | 250 ml | 1 | H ₂ SO ₄ | |
| T. Nitrogen | HDPE | 250 ml | 1 | H ₂ SO ₄ | |
| Diss. Cu and Zn * | HDPE | 250 ml | 1 | HNO ₃ | |
| Hardness, Total Cu and Zn | HDPE | 500 ml | 1 | HNO ₃ | |

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID: _____
 Filter blank sample ID: _____
 Transfer blank sample ID: _____

Visual and Olfactory Conditions:

Clarity: clear
 Color: light yellow
 Odor: none
 Sheen: none
 Floatables: rain

LABORATORY DELIVERY

Date: _____ Time: _____

Current Weather and Temp: 41° + Rainy

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

YSI Pro Plus (15D100020) _____

YSI Pro DSS 1 _____

YSI Pro DSS 2 _____

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): N/A

Reference Point (description): N/A

Water Quality Measurements

Temperature (°C) 5.7°

Specific Conductivity (µs/cm) 194.7

Dissolved Oxygen (mg/L) 12.31

Quality Assurance

Checked By: T. Lenth

Signature: [Signature]

Date Checked: 5-23-18

Time: _____

Data Entered into Database?

YES

NO

initials: _____

Date Entered: _____

Time: _____

Notes: _____

FIELD SAMPLING SHEET - Redmond Paired Watershed Study



HERRERA

Field Personnel: J. Gerard 6 Kaiser

Sample Date: 2018/02/28

Sample Time: 19:10

PDT:

SITE ID: SEIMN

Base Flow or Storm Event? (circled)

Field Filtered Time: 19:15

PST: X

Project Number: 14-05806-000

(Must filter within 15 minutes of collection)

Project Name: Redmond Paired Watershed Study

Water Quality Sampling

Sample ID: SEIMN-20180228

Current Weather and Temp: 41° rainy

| Parameter | Bottle Type | Bottle Volume | # Bottles | Preservative | Duplicated? |
|---------------------------|-------------|---------------|-----------|--------------------------------|-------------|
| TSS and Turbidity | HDPE | 1L | 1 | NA | |
| DOC * | HDPE | 250 ml | 1 | HCL | |
| Fecal Col. Bact. | HDPE | 250 ml | 1 | EDTA | |
| T. Phosphorous | HDPE | 250 ml | 1 | H ₂ SO ₄ | |
| T. Nitrogen | HDPE | 250 ml | 1 | H ₂ SO ₄ | |
| Diss. Cu and Zn * | HDPE | 250 ml | 1 | HNO ₃ | |
| Hardness, Total Cu and Zn | HDPE | 500 ml | 1 | HNO ₃ | |

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID:

Filter blank sample ID:

Transfer blank sample ID:

Visual and Olfactory Conditions:

Clarity: clear

Color: light yellow

Odor: none

Sheen: none

Floatables: none

LABORATORY DELIVERY

Date:

Time:

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

YSI Pro Plus (15D100020) _____

YSI Pro DSS 1 X

YSI Pro DSS 2 _____

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): 3.3 inches

Reference Point (description): top of brtt

Water Quality Measurements

Temperature (°C) 4.0°

Specific Conductivity (µs/cm) 47.2

Dissolved Oxygen (mg/L) 12.69

Quality Assurance

Checked By: T. Lenth

Signature: [Signature]

Date Checked: 5-23-18

Time:

Data Entered into Database?

YES

NO

initials:

Date Entered:

Time:

Notes:

FIELD SAMPLING SHEET - Redmond Paired Watershed Study



HERRERA

Field Personnel: M. Mulken

Sample Date: 2-29-18

Sample Time: 21:00

PDT:

SITE ID: SEIMS

Base Flow or Storm Event? 0

Field Filtered Time: 21:05

PST: X

Project Number: 14-05806-000

(Must filter within 15 minutes of collection)

Project Name: Redmond Paired Watershed Study

Current Weather and Temp: raining 42°

Water Quality Sampling

Sample ID: SEIMS 2018 0229

| Parameter | Bottle Type | Bottle Volume | # Bottles | Preservative | Duplicated? |
|---------------------------|-------------|---------------|-----------|--------------------------------|-------------|
| TSS and Turbidity | HDPE | 1L | 1 | NA | <u>NO</u> |
| DOC * | HDPE | 250 ml | 1 | HCL | <u>1</u> |
| Fecal Col. Bact. | HDPE | 250 ml | 1 | EDTA | <u>1</u> |
| T. Phosphorous | HDPE | 250 ml | 1 | H ₂ SO ₄ | <u>1</u> |
| T Nitrogen | HDPE | 250 ml | 1 | H ₂ SO ₄ | <u>1</u> |
| Diss. Cu and Zn * | HDPE | 250 ml | 1 | HNO ₃ | <u>1</u> |
| Hardness, Total Cu and Zn | HDPE | 500 ml | 1 | HNO ₃ | <u>1</u> |

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID: NA

Filter blank sample ID: ✓

Transfer blank sample ID: ✓

Visual and Olfactory Conditions:

Clarity: clear

Color: none

Odor: none

Sheen: none

Floatables: none

LABORATORY DELIVERY

Date:

Time:

Quality Assurance

Checked By: S. Lenth

Signature: [Signature]

Date Checked: 5-23-18

Time:

Data Entered into Database?

YES

NO

initials:

Date Entered:

Time:

Notes:

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

YSI Pro Plus (15D100020) _____

YSI Pro DSS 1 _____

YSI Pro DSS 2 X

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): 0.88

Reference Point (description): 56

Water Quality Measurements

Temperature (°C) 4.9

Specific Conductivity (µs/cm) 80.5

Dissolved Oxygen (mg/L) 11.94

FIELD SAMPLING SHEET - Redmond Paired Watershed Study



HERRERA

Field Personnel: J Gerard, G Kayser
 Sample Date: 2018/02/28 Sample Time: 16:40 PDT: _____
 Base Flow or Storm Event? (circled) Field Filtered Time: 16:45 PST:
(Must filter within 15 minutes of collection)

SITE ID: TOSMI
 Project Number: 14-05806-000

Water Quality Sampling

Sample ID: TOSMI-20180228

| Parameter | Bottle Type | Bottle Volume | # Bottles | Preservative | Duplicated? |
|---------------------------|-------------|---------------|-----------|--------------------------------|-------------|
| TSS and Turbidity | HDPE | 1L | 1 | NA | |
| DOC * | HDPE | 250 ml | 1 | HCL | |
| Fecal Col. Bact. | HDPE | 250 ml | 1 | EDTA | |
| T. Phosphorous | HDPE | 250 ml | 1 | H ₂ SO ₄ | |
| T Nitrogen | HDPE | 250 ml | 1 | H ₂ SO ₄ | |
| Diss. Cu and Zn * | HDPE | 250 ml | 1 | HNO ₃ | |
| Hardness, Total Cu and Zn | HDPE | 500 ml | 1 | HNO ₃ | |

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID: _____
 Filter blank sample ID: _____
 Transfer blank sample ID: _____

Visual and Olfactory Conditions:

Clarity: clear
 Color: none
 Odor: none
 Sheen: none
 Floatables: foam

LABORATORY DELIVERY

Date: _____ Time: _____

Quality Assurance

Checked By: T. Lenth Signature: [Signature]
 Date Checked: 5-23-18 Time: _____
 Data Entered into Database? YES NO initials: _____
 Date Entered: _____ Time: _____
 Notes: _____

Project Name: Redmond Paired Watershed Study

Current Weather and Temp: 45° rainy

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

YSI Pro Plus (15D100020) _____
 YSI Pro DSS 1 _____
 YSI Pro DSS 2 _____

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): .91
 Reference Point (description): 56

Water Quality Measurements

Temperature (°C) 6.9°
 Specific Conductivity (µs/cm) 180.3
 Dissolved Oxygen (mg/L) 11.97/99.2%

FIELD SAMPLING SHEET - Redmond Paired Watershed Study



HERRERA

Field Personnel: M. Miller

Sample Date: 2.20.18

Sample Time: 17:35 / 17:50 ^{QA}

PDT:

SITE ID: TOSMO

Base Flow or Storm Event? ☑

Field Filtered Time: 7:40 / 17:55

PST: X

Project Number: 14-05806-000

(Must filter within 15 minutes of collection)

Project Name: Redmond Paired Watershed Study

Water Quality Sampling

Sample ID: TOSMO 2018 0228

Current Weather and Temp: rainy 46°

| Parameter | Bottle Type | Bottle Volume | # Bottles | Preservative | Duplicated? |
|---------------------------|-------------|---------------|-----------|--------------------------------|-------------|
| TSS and Turbidity | HDPE | 1L | 1 | NA | yes |
| DOC * | HDPE | 250 ml | 1 | HCL | ↓ |
| Fecal Col. Bact. | HDPE | 250 ml | 1 | EDTA | |
| T. Phosphorous | HDPE | 250 ml | 1 | H ₂ SO ₄ | |
| T. Nitrogen | HDPE | 250 ml | 1 | H ₂ SO ₄ | |
| Diss. Cu and Zn * | HDPE | 250 ml | 1 | HNO ₃ | |
| Hardness, Total Cu and Zn | HDPE | 500 ml | 1 | HNO ₃ | |

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID: QA46 2018 0228

Filter blank sample ID: QA46 2018 0228

Transfer blank sample ID: _____

Visual and Olfactory Conditions:

Clarity: cloudy
 Color: brown
 Odor: none
 Sheen: none
 Floatables: some bubbles

LABORATORY DELIVERY

Date: _____ Time: _____

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

YSI Pro Plus (15D100020) _____

YSI Pro DSS 1 _____

YSI Pro DSS 2 X

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): 0.80

Reference Point (description): SG

Water Quality Measurements

Temperature (°C) 6.7

Specific Conductivity (µs/cm) 162.8

Dissolved Oxygen (mg/L) 12.01

Quality Assurance

Checked By: J. Lenth

Signature: [Signature]

Date Checked: 5-23-18

Time: _____

Data Entered into Database? _____

YES NO initials: _____

Date Entered: _____

Time: _____

Notes: _____

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: M Mullen

Sample Date: 2.28.18

Sample Time: 19:15

PDT:

SITE

ID: TYLMI

Base Flow or Storm Event? 0

Field Filtered Time: 19:20

PST:

Project Number: 14-05806-000



HERRERA

Project Name: Redmond Paired Watershed Study

Current Weather and Temp: rainy 44°F

Water Quality Sampling

Sample ID: TYLMI 20180228

| Parameter | Bottle Type | Bottle Volume | # Bottles | Preservative | Duplicated? |
|---------------------------|-------------|---------------|-----------|--------------------------------|-------------|
| TSS and Turbidity | HDPE | 1L | 1 | NA | <u>NO</u> |
| DOC * | HDPE | 250 ml | 1 | HCL | |
| Fecal Col. Bact. | HDPE | 250 ml | 1 | EDTA | |
| T. Phosphorous | HDPE | 250 ml | 1 | H ₂ SO ₄ | |
| T. Nitrogen | HDPE | 250 ml | 1 | H ₂ SO ₄ | |
| Diss. Cu and Zn * | HDPE | 250 ml | 1 | HNO ₃ | |
| Hardness, Total Cu and Zn | HDPE | 500 ml | 1 | HNO ₃ | |

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID: NA

Filter blank sample ID:

Transfer blank sample ID:

Visual and Olfactory Conditions:

Clarity: clear
 Color: none
 Odor: none
 Sheen: none
 Floatables: none some foam

LABORATORY DELIVERY

Date:

Time:

Quality Assurance

Checked By: J. Lenth

Signature: [Signature]

Date Checked: 5-23-18

Time:

Data Entered into Database?

YES

NO

initials:

Date Entered:

Time:

Notes:

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

YSI Pro Plus (15D100020)

YSI Pro DSS 1

YSI Pro DSS 2 X

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): 4.37

Reference Point (description):

down from top edge of DS culvert

Water Quality Measurements

Temperature (°C)

6.2

Specific Conductivity (µs/cm)

175.5

Dissolved Oxygen (mg/L)

11.71

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: M. Muller

Sample Date: 2-29-18

Sample Time: 18:40

PDT:

SITE ID:

TYLMO

Base Flow or Storm Event? (check)

Field Filtered Time: 18:45

PST: X

Project Number: 14-05806-000



HERRERA

Project Name: Redmond Paired Watershed Study

Current Weather and Temp: rainy, 46° F

Water Quality Sampling

Sample ID: TYLMO 20180229

| Parameter | Bottle Type | Bottle Volume | # Bottles | Preservative | Duplicated? |
|---------------------------|-------------|---------------|-----------|--------------------------------|-------------|
| TSS and Turbidity | HDPE | 1L | 1 | NA | <u>NC</u> |
| DOC * | HDPE | 250 ml | 1 | HCL | <u>↓</u> |
| Fecal Col. Bact. | HDPE | 250 ml | 1 | EDTA | <u>↓</u> |
| T. Phosphorous | HDPE | 250 ml | 1 | H ₂ SO ₄ | <u>↓</u> |
| T. Nitrogen | HDPE | 250 ml | 1 | H ₂ SO ₄ | <u>↓</u> |
| Diss. Cu and Zn * | HDPE | 250 ml | 1 | HNO ₃ | <u>↓</u> |
| Hardness, Total Cu and Zn | HDPE | 500 ml | 1 | HNO ₃ | <u>↓</u> |

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID: NA

Filter blank sample ID: /

Transfer blank sample ID: /

Visual and Olfactory Conditions:

Clarity: turbid
 Color: none
 Odor: none
 Sheen: none
 Floatables: none

LABORATORY DELIVERY

Date:

Time:

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

YSI Pro Plus (15D100020)

YSI Pro DSS 1

YSI Pro DSS 2 X

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): 2.85

Reference Point (description): down from top edge of culvert

Water Quality Measurements

Temperature (°C) 6.2

Specific Conductivity (µs/cm) 115.8

Dissolved Oxygen (mg/L) 11.05

Quality Assurance

Checked By: S. Lenth

Signature: [Signature]

Date Checked: 5-23-18

Time:

Data Entered into Database?

YES

NO

initials:

Date Entered:

Time:

Notes:



HERRERA

Data Quality Assurance Worksheet

Project Name/No./Client: Redmond Paired Watershed Study / 14-05806-000 / City of Redmond

Laboratory/Parameters: OnSite Environmental : TSS, turbidity, hardness, DOC, TP, Dissolved & Total Cu, Zn / AmTest: Total nitrogen, fecal coliform bacteria

Sample Date/Sample ID: 2/28/2018 / All sites, 1 FD (QA46) at TOSMO

By G. Catarra

Date 3/28/18 Page 1 of 2

Checked: initials
JL

date 5/23/2018

| Parameter | Completeness/ Methodology | Pre-preservation Holding Times (minutes) | | Total Holding Times (days) | | Method Blanks Reporting Limit | Matrix Spikes/ Surrogate Recovery (%) | | Lab Control Samples Recovery (%) | | Lab Duplicates RPD (%) | | Field Duplicates RPD (%) | | Instrument Calibration/ Performance | ACTION |
|-------------------------------------|------------------------------|--|------|-------------------------------|------|--|---|-------------------|--|-------------------|---------------------------|-------------------|-----------------------------|-------------------|---|--|
| | | Reported | Goal | Reported | Goal | | Reported | Goal ¹ | Reported | Goal ¹ | Reported | Goal ¹ | Reported | Goal ¹ | | |
| TSS | OK / SM 2540D | NA | NA | 6 | ≤7 | ≤1.0 mg/L 1.0 mg/L | NA | NA | 85 | ±20 | NC | ≤25 | 13 | ≤25 | OK | NONE |
| Turbidity | OK / EPA 180.1 | NA | NA | <1 | ≤2 | ≤0.1 NTU 0.1 NTU | NA | NA | NA | ±10 | 2 | ≤25 | 22 | ≤25 | OK | NONE |
| Hardness | OK / SM 2340B | NA | NA | 8 | ≤180 | ≤1.0 mg/L 1.0 mg/L | 103,100 | ±25 | 102 | ±15 | 4 | ≤20 | 8.8 | ≤20 | OK | NONE |
| DOC | OK / SM 5310B | <15 | ≤15 | 8 | ≤28 | ≤1.0 mg/L 1.0 mg/L | 98 | ±25 | 101 | ±15 | 2 | ≤20 | 4.6 | ≤20 | OK | NONE |
| Total Phosphorus | OK / EPA 365.1 | NA | NA | 7 | ≤28 | ≤0.01 mg/L 0.01 mg/L | 102 | ±25 | 102 | ±20 | NC | ≤20 | 21 | ≤20 | OK | FLAG TOSMO "J" DUE TO FD RPD. |
| Total Nitrogen (TKN + N+N) | OK/ SM 4500 N-B | NA | NA | 9,14 | ≤28 | ≤0.1 mg/L 0.1 mg/L | 87,90 | ±25 | 97-102 | ±20 | 1.7,2.5 | ≤20 | DIFF= 0.25 0 | ≤20 | OK | FLAG TKN AND TOTAL N "J" FOR TOSMO DUE TO FD DIFFERENCE. |

¹ If the sample or duplicate value is less than five times the reporting limit, the difference is calculated rather than the relative percent difference (RPD). The QA goal is a difference <2 times the detection limit instead of the number indicated in the goal column.

NA – not applicable or not available; NC – not calculable due to one or more values below the detection limit; NS – field duplicate not sampled.



Data Quality Assurance Worksheet

Project Name/No./Client: Redmond Paired Watershed Study / 14-05806-000 / City of Redmond

Laboratory/Parameters: OnSite Environmental : TSS, turbidity, hardness, DOC, TP, Dissolved & Total Cu, Zn / AmTest: total nitrogen, fecal coliform bacteria

Sample Date/Sample ID: 2/28/2018 / All sites, 1 FD (QA46) at TOSMO

By G. Catarra

Date 3/28/18 Page 2 of 2

Checked: initials JL

date 5/23/2018

| Parameter | Completeness/ Methodology | Pre-preservation Holding Times (minutes) | | Total Holding Times (days) | | Method Blanks Reporting Limit | Matrix Spikes/ Surrogate Recovery (%) | | Lab Control Samples Recovery (%) | | Lab Duplicates RPD (%) | | Field Duplicates RPD (%) | | Instrument Calibration/ Performance | ACTION |
|------------------|------------------------------|--|------|-------------------------------|------|--|---|-------------------|--|------|---------------------------|-------------------|-----------------------------|-------------------|---|--------|
| | | Reported | Goal | Reported | Goal | | Reported | Goal ¹ | Reported | Goal | Reported | Goal ¹ | Reported | Goal ¹ | | |
| Total Copper | OK/ EPA 200.8 | NA | NA | 8 | ≤180 | ≤1.0 µg/L 1.0 µg/L | 106,105 | ±25 | NR | ±15 | 5 | ≤20 | 9.5 | ≤20 | OK | NONE |
| Total Zinc | OK/ EPA 200.8 | NA | NA | 8 | ≤180 | ≤5.0 µg/L 5.0 µg/L | 109,108 | ±25 | NR | ±15 | 3 | ≤20 | 6.0 | ≤20 | OK | NONE |
| Dissolved Copper | OK/ EPA 200.8 | <15 | ≤15 | 7 | ≤180 | ≤1.0 µg/L 1.0 µg/L | 95,94 | ±25 | NR | ±15 | 4 | ≤20 | DIFF=1.0 | ≤20 | OK | NONE |
| Dissolved Zinc | OK/ EPA 200.8 | <15 | ≤15 | 7 | ≤180 | ≤5.0 µg/L 5.0 µg/L | 104,99 | ±25 | NR | ±15 | 2 | ≤20 | 5.7 | ≤20 | OK | NONE |
| Fecal Coliform | OK/ SM 9222D | NA | NA | <1 | ≤1 | ≤1.0 cfu/ 100mL 10 cfu/ 100mL | NA | NA | NA | NA | 15,19 | ≤35 | 15 | ≤50 | OK | NONE |

¹ If the sample or duplicate value is less than five times the reporting limit, the difference is calculated rather than the relative percent difference (RPD). The QA goal is a difference <2 times the detection limit instead of the number indicated in the goal column.

NA – not applicable or not available; NC – not calculable due to one or more values below the detection limit; NS – field duplicate not sampled.



14648 NE 95th Street, Redmond, WA 98052 • (425) 883-3881

March 23, 2018

George Iftner
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2200 6th Avenue, Suite 1100
Seattle, WA 98121

Re: Analytical Data for Project 14-05806-000
Laboratory Reference No. 1803-068

Dear George:

Enclosed are the analytical results and associated quality control data for samples submitted on March 8, 2018.

The standard policy of OnSite Environmental, Inc. is to store your samples for 30 days from the date of receipt. If you require longer storage, please contact the laboratory.

We appreciate the opportunity to be of service to you on this project. If you have any questions concerning the data, or need additional information, please feel free to call me.

Sincerely,

A handwritten signature in black ink, appearing to read "Blair Goodrow", enclosed within a large, loopy, handwritten oval scribble.

Blair Goodrow
Project Manager

Enclosures



OnSite Environmental, Inc. 14648 NE 95th Street, Redmond, WA 98052 (425) 883-3881

This report pertains to the samples analyzed in accordance with the chain of custody, and is intended only for the use of the individual or company to whom it is addressed.

Date of Report: March 23, 2018
Samples Submitted: March 8, 2018
Laboratory Reference: 1803-068
Project: 14-05806-000

Case Narrative

Samples were collected on March 8, 2018 and received by the laboratory on March 8, 2018. They were maintained at the laboratory at a temperature of 2°C to 6°C.

Please note that any and all soil sample results are reported on a dry-weight basis, unless otherwise noted below.

General QA/QC issues associated with the analytical data enclosed in this laboratory report will be indicated with a reference to a comment or explanation on the Data Qualifier page. More complex and involved QA/QC issues will be discussed in detail below.



Date of Report: March 23, 2018
 Samples Submitted: March 8, 2018
 Laboratory Reference: 1803-068
 Project: 14-05806-000

**TOTAL SUSPENDED SOLIDS
 SM 2540D**

Matrix: Water
 Units: mg/L

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|------------------------|----------------------|-----|----------|---------------|---------------|-------|
| Client ID: | COLM-20180308 | | | | | |
| Laboratory ID: | 03-068-01 | | | | | |
| Total Suspended Solids | 1.4 | 1.0 | SM 2540D | 3-12-18 | 3-13-18 | |

| | | | | | | |
|------------------------|-----------------------|-----|----------|---------|---------|--|
| Client ID: | COUMI-20180308 | | | | | |
| Laboratory ID: | 03-068-02 | | | | | |
| Total Suspended Solids | 20 | 1.0 | SM 2540D | 3-12-18 | 3-13-18 | |

| | | | | | | |
|------------------------|-----------------------|-----|----------|---------|---------|--|
| Client ID: | COUMO-20180308 | | | | | |
| Laboratory ID: | 03-068-03 | | | | | |
| Total Suspended Solids | 23 | 1.0 | SM 2540D | 3-12-18 | 3-13-18 | |

| | | | | | | |
|------------------------|-----------------------|-----|----------|---------|---------|--|
| Client ID: | EVAMS-20180308 | | | | | |
| Laboratory ID: | 03-068-04 | | | | | |
| Total Suspended Solids | 9.2 | 1.0 | SM 2540D | 3-12-18 | 3-13-18 | |

| | | | | | | |
|------------------------|------------------------|-----|----------|---------|---------|--|
| Client ID: | EVALSS-20180308 | | | | | |
| Laboratory ID: | 03-068-05 | | | | | |
| Total Suspended Solids | 10 | 1.0 | SM 2540D | 3-12-18 | 3-13-18 | |

| | | | | | | |
|------------------------|-----------------------|-----|----------|---------|---------|--|
| Client ID: | MONMN-20180308 | | | | | |
| Laboratory ID: | 03-068-06 | | | | | |
| Total Suspended Solids | 4.6 | 1.0 | SM 2540D | 3-12-18 | 3-13-18 | |

| | | | | | | |
|------------------------|-----------------------|-----|----------|---------|---------|--|
| Client ID: | MONMS-20180308 | | | | | |
| Laboratory ID: | 03-068-07 | | | | | |
| Total Suspended Solids | 13 | 1.0 | SM 2540D | 3-12-18 | 3-13-18 | |



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 Project: 14-05806-000

**TOTAL SUSPENDED SOLIDS
 SM 2540D**

Matrix: Water
 Units: mg/L

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|------------------------|----------------------|-----|----------|---------------|---------------|-------|
| Client ID: | MONM-20180308 | | | | | |
| Laboratory ID: | 03-068-08 | | | | | |
| Total Suspended Solids | 11 | 1.0 | SM 2540D | 3-12-18 | 3-13-18 | |

| | | | | | | |
|------------------------|-----------------------|-----|----------|---------|---------|--|
| Client ID: | SEIMN-20180308 | | | | | |
| Laboratory ID: | 03-068-09 | | | | | |
| Total Suspended Solids | 11 | 1.0 | SM 2540D | 3-12-18 | 3-13-18 | |

| | | | | | | |
|------------------------|-----------------------|-----|----------|---------|---------|--|
| Client ID: | SEIMS-20180308 | | | | | |
| Laboratory ID: | 03-068-10 | | | | | |
| Total Suspended Solids | 32 | 1.0 | SM 2540D | 3-12-18 | 3-13-18 | |

| | | | | | | |
|------------------------|-----------------------|-----|----------|---------|---------|--|
| Client ID: | TOSMI-20180308 | | | | | |
| Laboratory ID: | 03-068-11 | | | | | |
| Total Suspended Solids | 41 | 1.0 | SM 2540D | 3-12-18 | 3-13-18 | |

| | | | | | | |
|------------------------|-----------------------|-----|----------|---------|---------|--|
| Client ID: | TOSMO-20180308 | | | | | |
| Laboratory ID: | 03-068-12 | | | | | |
| Total Suspended Solids | 32 | 1.0 | SM 2540D | 3-12-18 | 3-13-18 | |

| | | | | | | |
|------------------------|-----------------------|-----|----------|---------|---------|--|
| Client ID: | TYLMI-20180308 | | | | | |
| Laboratory ID: | 03-068-13 | | | | | |
| Total Suspended Solids | 7.8 | 1.0 | SM 2540D | 3-12-18 | 3-13-18 | |

| | | | | | | |
|------------------------|-----------------------|-----|----------|---------|---------|--|
| Client ID: | TYLMO-20180308 | | | | | |
| Laboratory ID: | 03-068-14 | | | | | |
| Total Suspended Solids | 43 | 1.0 | SM 2540D | 3-12-18 | 3-13-18 | |



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TOTAL SUSPENDED SOLIDS
SM 2540D

Matrix: Water
Units: mg/L

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|------------------------|----------------------|------------|---------------|----------------------|----------------------|--------------|
| Client ID: | QA47-20180308 | | | | | |
| Laboratory ID: | 03-068-15 | | | | | |
| Total Suspended Solids | 19 | 1.0 | SM 2540D | 3-12-18 | 3-13-18 | |



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**TOTAL SUSPENDED SOLIDS
 SM 2540D
 QUALITY CONTROL**

Matrix: Water
 Units: mg/L

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|------------------------|-----------|-----|----------|---------------|---------------|-------|
| METHOD BLANK | | | | | | |
| Laboratory ID: | MB0312W1 | | | | | |
| Total Suspended Solids | ND | 1.0 | SM 2540D | 3-12-18 | 3-13-18 | |

| Analyte | Result | Spike Level | Source Result | Percent Recovery | Recovery Limits | RPD | RPD Limit | Flags |
|------------------------|-------------|-------------|---------------|------------------|-----------------|-----|-----------|-------|
| DUPLICATE | | | | | | | | |
| Laboratory ID: | 03-068-01 | | | | | | | |
| | ORIG | DUP | | | | | | |
| Total Suspended Solids | 1.40 | 1.36 | NA | NA | NA | NA | 3 | 17 |

| | | | | | | | | |
|------------------------|------------|-----|----|-----|--------|----|----|--|
| SPIKE BLANK | | | | | | | | |
| Laboratory ID: | SB0312W1 | | | | | | | |
| | SB | SB | | SB | | | | |
| Total Suspended Solids | 113 | 100 | NA | 113 | 76-114 | NA | NA | |



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 Project: 14-05806-000

TURBIDITY
EPA 180.1

Matrix: Water
 Units: NTU

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|-------------------|----------------------|------|-----------|---------------|---------------|-------|
| Client ID: | COLM-20180308 | | | | | |
| Laboratory ID: | 03-068-01 | | | | | |
| Turbidity | 0.95 | 0.10 | EPA 180.1 | 3-8-18 | 3-8-18 | |

| | | | | | | |
|-------------------|-----------------------|------|-----------|--------|--------|--|
| Client ID: | COUMI-20180308 | | | | | |
| Laboratory ID: | 03-068-02 | | | | | |
| Turbidity | 11 | 0.10 | EPA 180.1 | 3-8-18 | 3-8-18 | |

| | | | | | | |
|-------------------|-----------------------|------|-----------|--------|--------|--|
| Client ID: | COUMO-20180308 | | | | | |
| Laboratory ID: | 03-068-03 | | | | | |
| Turbidity | 15 | 0.10 | EPA 180.1 | 3-8-18 | 3-8-18 | |

| | | | | | | |
|-------------------|-----------------------|------|-----------|--------|--------|--|
| Client ID: | EVAMS-20180308 | | | | | |
| Laboratory ID: | 03-068-04 | | | | | |
| Turbidity | 5.9 | 0.10 | EPA 180.1 | 3-8-18 | 3-8-18 | |

| | | | | | | |
|-------------------|------------------------|------|-----------|--------|--------|--|
| Client ID: | EVALSS-20180308 | | | | | |
| Laboratory ID: | 03-068-05 | | | | | |
| Turbidity | 5.3 | 0.10 | EPA 180.1 | 3-8-18 | 3-8-18 | |

| | | | | | | |
|-------------------|-----------------------|------|-----------|--------|--------|--|
| Client ID: | MONMN-20180308 | | | | | |
| Laboratory ID: | 03-068-06 | | | | | |
| Turbidity | 4.2 | 0.10 | EPA 180.1 | 3-8-18 | 3-8-18 | |

| | | | | | | |
|-------------------|-----------------------|------|-----------|--------|--------|--|
| Client ID: | MONMS-20180308 | | | | | |
| Laboratory ID: | 03-068-07 | | | | | |
| Turbidity | 7.1 | 0.10 | EPA 180.1 | 3-8-18 | 3-8-18 | |



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TURBIDITY
EPA 180.1

Matrix: Water
 Units: NTU

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|-------------------|----------------------|------|-----------|---------------|---------------|-------|
| Client ID: | MONM-20180308 | | | | | |
| Laboratory ID: | 03-068-08 | | | | | |
| Turbidity | 8.4 | 0.10 | EPA 180.1 | 3-8-18 | 3-8-18 | |

| | | | | | | |
|-------------------|-----------------------|------|-----------|--------|--------|--|
| Client ID: | SEIMN-20180308 | | | | | |
| Laboratory ID: | 03-068-09 | | | | | |
| Turbidity | 7.0 | 0.10 | EPA 180.1 | 3-8-18 | 3-8-18 | |

| | | | | | | |
|-------------------|-----------------------|------|-----------|--------|--------|--|
| Client ID: | SEIMS-20180308 | | | | | |
| Laboratory ID: | 03-068-10 | | | | | |
| Turbidity | 16 | 0.10 | EPA 180.1 | 3-8-18 | 3-8-18 | |

| | | | | | | |
|-------------------|-----------------------|------|-----------|--------|--------|--|
| Client ID: | TOSMI-20180308 | | | | | |
| Laboratory ID: | 03-068-11 | | | | | |
| Turbidity | 27 | 0.10 | EPA 180.1 | 3-8-18 | 3-8-18 | |

| | | | | | | |
|-------------------|-----------------------|------|-----------|--------|--------|--|
| Client ID: | TOSMO-20180308 | | | | | |
| Laboratory ID: | 03-068-12 | | | | | |
| Turbidity | 25 | 0.10 | EPA 180.1 | 3-8-18 | 3-8-18 | |

| | | | | | | |
|-------------------|-----------------------|------|-----------|--------|--------|--|
| Client ID: | TYLMI-20180308 | | | | | |
| Laboratory ID: | 03-068-13 | | | | | |
| Turbidity | 6.3 | 0.10 | EPA 180.1 | 3-8-18 | 3-8-18 | |

| | | | | | | |
|-------------------|-----------------------|------|-----------|--------|--------|--|
| Client ID: | TYLMO-20180308 | | | | | |
| Laboratory ID: | 03-068-14 | | | | | |
| Turbidity | 28 | 0.10 | EPA 180.1 | 3-8-18 | 3-8-18 | |



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TURBIDITY
EPA 180.1

Matrix: Water
Units: NTU

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|-------------------|----------------------|------------|---------------|----------------------|----------------------|--------------|
| Client ID: | QA47-20180308 | | | | | |
| Laboratory ID: | 03-068-15 | | | | | |
| Turbidity | 11 | 0.10 | EPA 180.1 | 3-8-18 | 3-8-18 | |



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**TURBIDITY
 EPA 180.1
 QUALITY CONTROL**

Matrix: Water
 Units: NTU

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|---------------------|-----------|------|-----------|---------------|---------------|-------|
| METHOD BLANK | | | | | | |
| Laboratory ID: | MB0308W1 | | | | | |
| Turbidity | ND | 0.10 | EPA 180.1 | 3-8-18 | 3-8-18 | |

| Analyte | Result | Spike Level | Source Result | Percent Recovery | Recovery Limits | RPD | RPD Limit | Flags |
|------------------|-------------|-------------|---------------|------------------|-----------------|-----|-----------|-------|
| DUPLICATE | | | | | | | | |
| Laboratory ID: | 03-066-01 | | | | | | | |
| | ORIG | DUP | | | | | | |
| Turbidity | 55.5 | 55.6 | NA | NA | NA | NA | 0 | 15 |



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HARDNESS
EPA 200.7/SM 2340B

Matrix: Water
 Units: mg eqt. CaCO₃/L (ppm)

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|-------------------|----------------------|-----|----------------|---------------|---------------|-------|
| Client ID: | COLM-20180308 | | | | | |
| Laboratory ID: | 03-068-01 | | | | | |
| Hardness | 8.4 | 1.0 | 200.7/SM 2340B | 3-3-18 | 3-13-18 | |

| | | | | | | |
|-------------------|-----------------------|-----|----------------|--------|---------|--|
| Client ID: | COUMI-20180308 | | | | | |
| Laboratory ID: | 03-068-02 | | | | | |
| Hardness | 90 | 1.0 | 200.7/SM 2340B | 3-3-18 | 3-13-18 | |

| | | | | | | |
|-------------------|-----------------------|-----|----------------|--------|---------|--|
| Client ID: | COUMO-20180308 | | | | | |
| Laboratory ID: | 03-068-03 | | | | | |
| Hardness | 69 | 1.0 | 200.7/SM 2340B | 3-3-18 | 3-13-18 | |

| | | | | | | |
|-------------------|-----------------------|-----|----------------|--------|---------|--|
| Client ID: | EVAMS-20180308 | | | | | |
| Laboratory ID: | 03-068-04 | | | | | |
| Hardness | 84 | 1.0 | 200.7/SM 2340B | 3-3-18 | 3-13-18 | |

| | | | | | | |
|-------------------|------------------------|-----|----------------|--------|---------|--|
| Client ID: | EVALSS-20180308 | | | | | |
| Laboratory ID: | 03-068-05 | | | | | |
| Hardness | 77 | 1.0 | 200.7/SM 2340B | 3-3-18 | 3-13-18 | |

| | | | | | | |
|-------------------|-----------------------|-----|----------------|--------|---------|--|
| Client ID: | MONMN-20180308 | | | | | |
| Laboratory ID: | 03-068-06 | | | | | |
| Hardness | 56 | 1.0 | 200.7/SM 2340B | 3-3-18 | 3-13-18 | |

| | | | | | | |
|-------------------|-----------------------|-----|----------------|--------|---------|--|
| Client ID: | MONMS-20180308 | | | | | |
| Laboratory ID: | 03-068-07 | | | | | |
| Hardness | 110 | 1.0 | 200.7/SM 2340B | 3-3-18 | 3-13-18 | |



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HARDNESS
EPA 200.7/SM 2340B

Matrix: Water
 Units: mg eqt. CaCO₃/L (ppm)

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|-------------------|----------------------|-----|----------------|---------------|---------------|-------|
| Client ID: | MONM-20180308 | | | | | |
| Laboratory ID: | 03-068-08 | | | | | |
| Hardness | 77 | 1.0 | 200.7/SM 2340B | 3-3-18 | 3-13-18 | |

| | | | | | | |
|-------------------|-----------------------|-----|----------------|--------|---------|--|
| Client ID: | SEIMN-20180308 | | | | | |
| Laboratory ID: | 03-068-09 | | | | | |
| Hardness | 21 | 1.0 | 200.7/SM 2340B | 3-3-18 | 3-13-18 | |

| | | | | | | |
|-------------------|-----------------------|-----|----------------|--------|---------|--|
| Client ID: | SEIMS-20180308 | | | | | |
| Laboratory ID: | 03-068-10 | | | | | |
| Hardness | 38 | 1.0 | 200.7/SM 2340B | 3-3-18 | 3-13-18 | |

| | | | | | | |
|-------------------|-----------------------|-----|----------------|--------|---------|--|
| Client ID: | TOSMI-20180308 | | | | | |
| Laboratory ID: | 03-068-11 | | | | | |
| Hardness | 49 | 1.0 | 200.7/SM 2340B | 3-3-18 | 3-13-18 | |

| | | | | | | |
|-------------------|-----------------------|-----|----------------|--------|---------|--|
| Client ID: | TOSMO-20180308 | | | | | |
| Laboratory ID: | 03-068-12 | | | | | |
| Hardness | 72 | 1.0 | 200.7/SM 2340B | 3-3-18 | 3-13-18 | |

| | | | | | | |
|-------------------|-----------------------|-----|----------------|--------|---------|--|
| Client ID: | TYLMI-20180308 | | | | | |
| Laboratory ID: | 03-068-13 | | | | | |
| Hardness | 77 | 1.0 | 200.7/SM 2340B | 3-3-18 | 3-13-18 | |

| | | | | | | |
|-------------------|-----------------------|-----|----------------|--------|---------|--|
| Client ID: | TYLMO-20180308 | | | | | |
| Laboratory ID: | 03-068-14 | | | | | |
| Hardness | 40 | 1.0 | 200.7/SM 2340B | 3-3-18 | 3-13-18 | |



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Laboratory Reference: 1803-068
Project: 14-05806-000

HARDNESS
EPA 200.7/SM 2340B

Matrix: Water
Units: mg eqt. CaCO₃/L (ppm)

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|-------------------|----------------------|------------|----------------|----------------------|----------------------|--------------|
| Client ID: | QA47-20180308 | | | | | |
| Laboratory ID: | 03-068-15 | | | | | |
| Hardness | 94 | 1.0 | 200.7/SM 2340B | 3-3-18 | 3-13-18 | |



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HARDNESS
EPA 200.7/SM 2340B
QUALITY CONTROL

Matrix: Water
 Units: mg eqt. CaCO₃/L (ppm)

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|---------------------|-----------|-----|----------------|---------------|---------------|-------|
| METHOD BLANK | | | | | | |
| Laboratory ID: | MB0313WH1 | | | | | |
| Hardness | ND | 1.0 | 200.7/SM 2340B | 3-3-18 | 3-13-18 | |

| Analyte | Result | Spike Level | Source Result | Percent Recovery | Recovery Limits | RPD | RPD Limit | Flags |
|------------------|-------------|-------------|---------------|------------------|-----------------|-----|-----------|-------|
| DUPLICATE | | | | | | | | |
| Laboratory ID: | 03-068-06 | | | | | | | |
| | ORIG | DUP | | | | | | |
| Hardness | 56.0 | 54.1 | NA | NA | NA | 3 | 20 | |

| Analyte | Result | Spike Level | Source Result | Percent Recovery | Recovery Limits | RPD | RPD Limit | Flags | | |
|----------------------|------------|-------------|---------------|------------------|-----------------|-----|-----------|--------|---|----|
| MATRIX SPIKES | | | | | | | | | | |
| Laboratory ID: | 03-068-06 | | | | | | | | | |
| | MS | MSD | MS | MSD | MS | MSD | | | | |
| Hardness | 187 | 188 | 132 | 132 | 56.0 | 99 | 100 | 75-125 | 1 | 20 |

| Analyte | Result | Spike Level | Source Result | Percent Recovery | Recovery Limits | RPD | RPD Limit | Flags |
|--------------------|------------|-------------|---------------|------------------|-----------------|-----|-----------|-------|
| SPIKE BLANK | | | | | | | | |
| Laboratory ID: | SB0313WH1 | | | | | | | |
| | SB | SB | SB | SB | SB | | | |
| Hardness | 132 | 132 | NA | 100 | 80-120 | NA | NA | |



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**DISSOLVED ORGANIC CARBON
 SM 5310B**

Matrix: Water
 Units: mg/L

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|--------------------------|------------------------|-----|----------|---------------|---------------|-------|
| Client ID: | COLM-20180308 | | | | | |
| Laboratory ID: | 03-068-01 | | | | | |
| Dissolved Organic Carbon | 9.4 | 1.0 | SM 5310B | 3-15-18 | 3-15-18 | |
| Client ID: | COUMI-20180308 | | | | | |
| Laboratory ID: | 03-068-02 | | | | | |
| Dissolved Organic Carbon | 3.9 | 1.0 | SM 5310B | 3-15-18 | 3-15-18 | |
| Client ID: | COUMO-20180308 | | | | | |
| Laboratory ID: | 03-068-03 | | | | | |
| Dissolved Organic Carbon | 3.9 | 1.0 | SM 5310B | 3-15-18 | 3-15-18 | |
| Client ID: | EVAMS-20180308 | | | | | |
| Laboratory ID: | 03-068-04 | | | | | |
| Dissolved Organic Carbon | 3.9 | 1.0 | SM 5310B | 3-15-18 | 3-15-18 | |
| Client ID: | EVALSS-20180308 | | | | | |
| Laboratory ID: | 03-068-05 | | | | | |
| Dissolved Organic Carbon | 3.6 | 1.0 | SM 5310B | 3-15-18 | 3-15-18 | |
| Client ID: | MONMN-20180308 | | | | | |
| Laboratory ID: | 03-068-06 | | | | | |
| Dissolved Organic Carbon | 4.4 | 1.0 | SM 5310B | 3-15-18 | 3-15-18 | |
| Client ID: | MONMS-20180308 | | | | | |
| Laboratory ID: | 03-068-07 | | | | | |
| Dissolved Organic Carbon | 5.2 | 1.0 | SM 5310B | 3-15-18 | 3-15-18 | |



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 Project: 14-05806-000

**DISSOLVED ORGANIC CARBON
 SM 5310B**

Matrix: Water
 Units: mg/L

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|--------------------------|-----------------------|-----|----------|---------------|---------------|-------|
| Client ID: | MONM-20180308 | | | | | |
| Laboratory ID: | 03-068-08 | | | | | |
| Dissolved Organic Carbon | 4.5 | 1.0 | SM 5310B | 3-15-18 | 3-15-18 | |
| Client ID: | SEIMN-20180308 | | | | | |
| Laboratory ID: | 03-068-09 | | | | | |
| Dissolved Organic Carbon | 6.4 | 1.0 | SM 5310B | 3-15-18 | 3-15-18 | |
| Client ID: | SEIMS-20180308 | | | | | |
| Laboratory ID: | 03-068-10 | | | | | |
| Dissolved Organic Carbon | 5.2 | 1.0 | SM 5310B | 3-15-18 | 3-15-18 | |
| Client ID: | TOSMI-20180308 | | | | | |
| Laboratory ID: | 03-068-11 | | | | | |
| Dissolved Organic Carbon | 4.8 | 1.0 | SM 5310B | 3-15-18 | 3-15-18 | |
| Client ID: | TOSMO-20180308 | | | | | |
| Laboratory ID: | 03-068-12 | | | | | |
| Dissolved Organic Carbon | 5.0 | 1.0 | SM 5310B | 3-15-18 | 3-15-18 | |
| Client ID: | TYLMI-20180308 | | | | | |
| Laboratory ID: | 03-068-13 | | | | | |
| Dissolved Organic Carbon | 5.0 | 1.0 | SM 5310B | 3-15-18 | 3-15-18 | |
| Client ID: | TYLMO-20180308 | | | | | |
| Laboratory ID: | 03-068-14 | | | | | |
| Dissolved Organic Carbon | 3.7 | 1.0 | SM 5310B | 3-15-18 | 3-15-18 | |



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Samples Submitted: March 8, 2018
Laboratory Reference: 1803-068
Project: 14-05806-000

**DISSOLVED ORGANIC CARBON
SM 5310B**

Matrix: Water
Units: mg/L

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|--------------------------|----------------------|------------|---------------|----------------------|----------------------|--------------|
| Client ID: | QA47-20180308 | | | | | |
| Laboratory ID: | 03-068-15 | | | | | |
| Dissolved Organic Carbon | 3.8 | 1.0 | SM 5310B | 3-15-18 | 3-15-18 | |



Date of Report: March 23, 2018
 Samples Submitted: March 8, 2018
 Laboratory Reference: 1803-068
 Project: 14-05806-000

**DISSOLVED ORGANIC CARBON
 SM 5310B
 QUALITY CONTROL**

Matrix: Water
 Units: mg/L

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|--------------------------|-----------|-----|----------|---------------|---------------|-------|
| METHOD BLANK | | | | | | |
| Laboratory ID: | MB0315D1 | | | | | |
| Dissolved Organic Carbon | ND | 1.0 | SM 5310B | 3-15-18 | 3-15-18 | |

| Analyte | Result | Spike Level | Source Result | Percent Recovery | Recovery Limits | RPD | RPD Limit | Flags |
|--------------------------|-------------|-------------|---------------|------------------|-----------------|-----|-----------|-------|
| DUPLICATE | | | | | | | | |
| Laboratory ID: | 03-068-01 | | | | | | | |
| | ORIG | DUP | | | | | | |
| Dissolved Organic Carbon | 9.42 | 9.37 | NA | NA | NA | 1 | 15 | |

MATRIX SPIKE

| | | | | | | | | |
|--------------------------|-------------|------|------|-----|--------|----|----|--|
| Laboratory ID: | 03-068-01 | | | | | | | |
| | MS | MS | | MS | | | | |
| Dissolved Organic Carbon | 19.4 | 10.0 | 9.42 | 100 | 75-125 | NA | NA | |

SPIKE BLANK

| | | | | | | | | |
|--------------------------|-------------|------|----|-----|--------|----|----|--|
| Laboratory ID: | SB0315D1 | | | | | | | |
| | SB | SB | | SB | | | | |
| Dissolved Organic Carbon | 9.98 | 10.0 | NA | 100 | 80-120 | NA | NA | |



Date of Report: March 23, 2018
 Samples Submitted: March 8, 2018
 Laboratory Reference: 1803-068
 Project: 14-05806-000

TOTAL PHOSPHORUS
EPA 365.1

Matrix: Water
 Units: mg/L

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|-------------------|----------------------|-------|-----------|---------------|---------------|-------|
| Client ID: | COLM-20180308 | | | | | |
| Laboratory ID: | 03-068-01 | | | | | |
| Total Phosphorus | 0.012 | 0.010 | EPA 365.1 | 3-13-18 | 3-20-18 | |

| | | | | | | |
|-------------------|-----------------------|-------|-----------|---------|---------|--|
| Client ID: | COUMI-20180308 | | | | | |
| Laboratory ID: | 03-068-02 | | | | | |
| Total Phosphorus | 0.065 | 0.010 | EPA 365.1 | 3-13-18 | 3-20-18 | |

| | | | | | | |
|-------------------|-----------------------|-------|-----------|---------|---------|--|
| Client ID: | COUMO-20180308 | | | | | |
| Laboratory ID: | 03-068-03 | | | | | |
| Total Phosphorus | 0.067 | 0.010 | EPA 365.1 | 3-13-18 | 3-20-18 | |

| | | | | | | |
|-------------------|-----------------------|-------|-----------|---------|---------|--|
| Client ID: | EVAMS-20180308 | | | | | |
| Laboratory ID: | 03-068-04 | | | | | |
| Total Phosphorus | 0.019 | 0.010 | EPA 365.1 | 3-13-18 | 3-20-18 | |

| | | | | | | |
|-------------------|------------------------|-------|-----------|---------|---------|--|
| Client ID: | EVALSS-20180308 | | | | | |
| Laboratory ID: | 03-068-05 | | | | | |
| Total Phosphorus | 0.026 | 0.010 | EPA 365.1 | 3-13-18 | 3-20-18 | |

| | | | | | | |
|-------------------|-----------------------|-------|-----------|---------|---------|--|
| Client ID: | MONMN-20180308 | | | | | |
| Laboratory ID: | 03-068-06 | | | | | |
| Total Phosphorus | 0.023 | 0.010 | EPA 365.1 | 3-13-18 | 3-20-18 | |

| | | | | | | |
|-------------------|-----------------------|-------|-----------|---------|---------|--|
| Client ID: | MONMS-20180308 | | | | | |
| Laboratory ID: | 03-068-07 | | | | | |
| Total Phosphorus | 0.043 | 0.010 | EPA 365.1 | 3-13-18 | 3-20-18 | |



Date of Report: March 23, 2018
 Samples Submitted: March 8, 2018
 Laboratory Reference: 1803-068
 Project: 14-05806-000

TOTAL PHOSPHORUS
EPA 365.1

Matrix: Water
 Units: mg/L

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|-------------------|----------------------|-------|-----------|---------------|---------------|-------|
| Client ID: | MONM-20180308 | | | | | |
| Laboratory ID: | 03-068-08 | | | | | |
| Total Phosphorus | 0.035 | 0.010 | EPA 365.1 | 3-13-18 | 3-20-18 | |

| | | | | | | |
|-------------------|-----------------------|-------|-----------|---------|---------|--|
| Client ID: | SEIMN-20180308 | | | | | |
| Laboratory ID: | 03-068-09 | | | | | |
| Total Phosphorus | 0.021 | 0.010 | EPA 365.1 | 3-13-18 | 3-20-18 | |

| | | | | | | |
|-------------------|-----------------------|-------|-----------|---------|---------|--|
| Client ID: | SEIMS-20180308 | | | | | |
| Laboratory ID: | 03-068-10 | | | | | |
| Total Phosphorus | 0.050 | 0.010 | EPA 365.1 | 3-13-18 | 3-20-18 | |

| | | | | | | |
|-------------------|-----------------------|-------|-----------|---------|---------|--|
| Client ID: | TOSMI-20180308 | | | | | |
| Laboratory ID: | 03-068-11 | | | | | |
| Total Phosphorus | 0.055 | 0.010 | EPA 365.1 | 3-13-18 | 3-20-18 | |

| | | | | | | |
|-------------------|-----------------------|-------|-----------|---------|---------|--|
| Client ID: | TOSMO-20180308 | | | | | |
| Laboratory ID: | 03-068-12 | | | | | |
| Total Phosphorus | 0.066 | 0.010 | EPA 365.1 | 3-13-18 | 3-20-18 | |

| | | | | | | |
|-------------------|-----------------------|-------|-----------|---------|---------|--|
| Client ID: | TYLMI-20180308 | | | | | |
| Laboratory ID: | 03-068-13 | | | | | |
| Total Phosphorus | 0.028 | 0.010 | EPA 365.1 | 3-13-18 | 3-20-18 | |

| | | | | | | |
|-------------------|-----------------------|-------|-----------|---------|---------|--|
| Client ID: | TYLMO-20180308 | | | | | |
| Laboratory ID: | 03-068-14 | | | | | |
| Total Phosphorus | 0.092 | 0.010 | EPA 365.1 | 3-13-18 | 3-20-18 | |



Date of Report: March 23, 2018
Samples Submitted: March 8, 2018
Laboratory Reference: 1803-068
Project: 14-05806-000

TOTAL PHOSPHORUS
EPA 365.1

Matrix: Water
Units: mg/L

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|-------------------|----------------------|------------|---------------|----------------------|----------------------|--------------|
| Client ID: | QA47-20180308 | | | | | |
| Laboratory ID: | 03-068-15 | | | | | |
| Total Phosphorus | 0.059 | 0.010 | EPA 365.1 | 3-13-18 | 3-20-18 | |



Date of Report: March 23, 2018
 Samples Submitted: March 8, 2018
 Laboratory Reference: 1803-068
 Project: 14-05806-000

**TOTAL PHOSPHORUS
 EPA 365.1
 QUALITY CONTROL**

Matrix: Water
 Units: mg/L

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|---------------------|-----------|-------|-----------|---------------|---------------|-------|
| METHOD BLANK | | | | | | |
| Laboratory ID: | MB0313W1 | | | | | |
| Total Phosphorus | ND | 0.010 | EPA 365.1 | 3-13-18 | 3-20-18 | |

| Analyte | Result | Spike Level | Source Result | Percent Recovery | Recovery Limits | RPD | RPD Limit | Flags |
|------------------|---------------|---------------|---------------|------------------|-----------------|-----|-----------|-------|
| DUPLICATE | | | | | | | | |
| Laboratory ID: | 03-068-01 | | | | | | | |
| | ORIG | DUP | | | | | | |
| Total Phosphorus | 0.0122 | 0.0133 | NA | NA | NA | 9 | 11 | |

| | | | | | | | | |
|---------------------|--------------|-------|--------|-----|--------|----|----|--|
| MATRIX SPIKE | | | | | | | | |
| Laboratory ID: | 03-068-01 | | | | | | | |
| | MS | MS | | MS | | | | |
| Total Phosphorus | 0.264 | 0.250 | 0.0122 | 101 | 82-124 | NA | NA | |

| | | | | | | | | |
|--------------------|--------------|-------|----|----|--------|----|----|--|
| SPIKE BLANK | | | | | | | | |
| Laboratory ID: | SB0313W1 | | | | | | | |
| | SB | SB | | SB | | | | |
| Total Phosphorus | 0.247 | 0.250 | NA | 99 | 87-114 | NA | NA | |



Date of Report: March 23, 2018
 Samples Submitted: March 8, 2018
 Laboratory Reference: 1803-068
 Project: 14-05806-000

**TOTAL METALS
 EPA 200.8**

Matrix: Water
 Units: ug/L (ppb)

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|-------------------|----------------------|-----|-----------|---------------|---------------|-------|
| Client ID: | COLM-20180308 | | | | | |
| Laboratory ID: | 03-068-01 | | | | | |
| Copper | ND | 1.0 | EPA 200.8 | 3-14-18 | 3-16-18 | |
| Zinc | ND | 5.0 | EPA 200.8 | 3-14-18 | 3-16-18 | |

| | | | | | | |
|-------------------|-----------------------|-----|-----------|---------|---------|--|
| Client ID: | COUMI-20180308 | | | | | |
| Laboratory ID: | 03-068-02 | | | | | |
| Copper | 2.8 | 1.0 | EPA 200.8 | 3-14-18 | 3-16-18 | |
| Zinc | 12 | 5.0 | EPA 200.8 | 3-14-18 | 3-16-18 | |

| | | | | | | |
|-------------------|-----------------------|-----|-----------|---------|---------|--|
| Client ID: | COUMO-20180308 | | | | | |
| Laboratory ID: | 03-068-03 | | | | | |
| Copper | 5.2 | 1.0 | EPA 200.8 | 3-14-18 | 3-16-18 | |
| Zinc | 27 | 5.0 | EPA 200.8 | 3-14-18 | 3-16-18 | |

| | | | | | | |
|-------------------|-----------------------|-----|-----------|---------|---------|--|
| Client ID: | EVAMS-20180308 | | | | | |
| Laboratory ID: | 03-068-04 | | | | | |
| Copper | ND | 1.0 | EPA 200.8 | 3-14-18 | 3-16-18 | |
| Zinc | ND | 5.0 | EPA 200.8 | 3-14-18 | 3-16-18 | |

| | | | | | | |
|-------------------|------------------------|-----|-----------|---------|---------|--|
| Client ID: | EVALSS-20180308 | | | | | |
| Laboratory ID: | 03-068-05 | | | | | |
| Copper | ND | 1.0 | EPA 200.8 | 3-14-18 | 3-16-18 | |
| Zinc | ND | 5.0 | EPA 200.8 | 3-14-18 | 3-16-18 | |

| | | | | | | |
|-------------------|-----------------------|-----|-----------|---------|---------|--|
| Client ID: | MONMN-20180308 | | | | | |
| Laboratory ID: | 03-068-06 | | | | | |
| Copper | 1.4 | 1.0 | EPA 200.8 | 3-14-18 | 3-16-18 | |
| Zinc | ND | 5.0 | EPA 200.8 | 3-14-18 | 3-16-18 | |

| | | | | | | |
|-------------------|-----------------------|-----|-----------|---------|---------|--|
| Client ID: | MONMS-20180308 | | | | | |
| Laboratory ID: | 03-068-07 | | | | | |
| Copper | 2.5 | 1.0 | EPA 200.8 | 3-14-18 | 3-15-18 | |
| Zinc | 7.3 | 5.0 | EPA 200.8 | 3-14-18 | 3-15-18 | |



Date of Report: March 23, 2018
 Samples Submitted: March 8, 2018
 Laboratory Reference: 1803-068
 Project: 14-05806-000

**TOTAL METALS
 EPA 200.8**

Matrix: Water
 Units: ug/L (ppb)

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|-------------------|----------------------|-----|-----------|---------------|---------------|-------|
| Client ID: | MONM-20180308 | | | | | |
| Laboratory ID: | 03-068-08 | | | | | |
| Copper | 1.7 | 1.0 | EPA 200.8 | 3-14-18 | 3-16-18 | |
| Zinc | 15 | 5.0 | EPA 200.8 | 3-14-18 | 3-16-18 | |

| | | | | | | |
|-------------------|-----------------------|-----|-----------|---------|---------|--|
| Client ID: | SEIMN-20180308 | | | | | |
| Laboratory ID: | 03-068-09 | | | | | |
| Copper | ND | 1.0 | EPA 200.8 | 3-14-18 | 3-17-18 | |
| Zinc | ND | 5.0 | EPA 200.8 | 3-14-18 | 3-17-18 | |

| | | | | | | |
|-------------------|-----------------------|-----|-----------|---------|---------|--|
| Client ID: | SEIMS-20180308 | | | | | |
| Laboratory ID: | 03-068-10 | | | | | |
| Copper | ND | 1.0 | EPA 200.8 | 3-14-18 | 3-17-18 | |
| Zinc | ND | 5.0 | EPA 200.8 | 3-14-18 | 3-17-18 | |

| | | | | | | |
|-------------------|-----------------------|-----|-----------|---------|---------|--|
| Client ID: | TOSMI-20180308 | | | | | |
| Laboratory ID: | 03-068-11 | | | | | |
| Copper | 8.7 | 1.0 | EPA 200.8 | 3-14-18 | 3-17-18 | |
| Zinc | 56 | 5.0 | EPA 200.8 | 3-14-18 | 3-17-18 | |

| | | | | | | |
|-------------------|-----------------------|-----|-----------|---------|---------|--|
| Client ID: | TOSMO-20180308 | | | | | |
| Laboratory ID: | 03-068-12 | | | | | |
| Copper | 6.6 | 1.0 | EPA 200.8 | 3-14-18 | 3-17-18 | |
| Zinc | 44 | 5.0 | EPA 200.8 | 3-14-18 | 3-17-18 | |

| | | | | | | |
|-------------------|-----------------------|-----|-----------|---------|---------|--|
| Client ID: | TYLMI-20180308 | | | | | |
| Laboratory ID: | 03-068-13 | | | | | |
| Copper | 4.3 | 1.0 | EPA 200.8 | 3-14-18 | 3-17-18 | |
| Zinc | 11 | 5.0 | EPA 200.8 | 3-14-18 | 3-17-18 | |

| | | | | | | |
|-------------------|-----------------------|-----|-----------|---------|---------|--|
| Client ID: | TYLMO-20180308 | | | | | |
| Laboratory ID: | 03-068-14 | | | | | |
| Copper | 8.5 | 1.0 | EPA 200.8 | 3-14-18 | 3-17-18 | |
| Zinc | 43 | 5.0 | EPA 200.8 | 3-14-18 | 3-17-18 | |



Date of Report: March 23, 2018
Samples Submitted: March 8, 2018
Laboratory Reference: 1803-068
Project: 14-05806-000

TOTAL METALS
EPA 200.8

Matrix: Water
Units: ug/L (ppb)

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|-------------------|----------------------|------------|---------------|----------------------|----------------------|--------------|
| Client ID: | QA47-20180308 | | | | | |
| Laboratory ID: | 03-068-15 | | | | | |
| Copper | 2.3 | 1.0 | EPA 200.8 | 3-14-18 | 3-17-18 | |
| Zinc | 11 | 5.0 | EPA 200.8 | 3-14-18 | 3-17-18 | |



Date of Report: March 23, 2018
 Samples Submitted: March 8, 2018
 Laboratory Reference: 1803-068
 Project: 14-05806-000

**TOTAL METALS
 EPA 200.8
 QUALITY CONTROL**

Matrix: Water
 Units: ug/L (ppb)

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|---------------------|-----------|-----|-----------|---------------|---------------|-------|
| METHOD BLANK | | | | | | |
| Laboratory ID: | MB0314WH1 | | | | | |
| Copper | ND | 1.0 | EPA 200.8 | 3-14-18 | 3-15-18 | |
| Zinc | ND | 5.0 | EPA 200.8 | 3-14-18 | 3-15-18 | |

| Analyte | Result | Spike Level | Source Result | Percent Recovery | Recovery Limits | RPD | RPD Limit | Flags |
|------------------|-------------|-------------|---------------|------------------|-----------------|-----|-----------|-------|
| DUPLICATE | | | | | | | | |
| Laboratory ID: | 03-068-07 | | | | | | | |
| | ORIG | DUP | | | | | | |
| Copper | 2.54 | 2.50 | NA | NA | NA | NA | 2 | 20 |
| Zinc | 7.28 | 6.68 | NA | NA | NA | NA | 9 | 20 |

MATRIX SPIKES

| | | | | | | | | | | |
|----------------|-------------|------------|-----|-----|------|------------|------------|--------|---|----|
| Laboratory ID: | 03-068-07 | | | | | | | | | |
| | MS | MSD | MS | MSD | | MS | MSD | | | |
| Copper | 99.0 | 101 | 100 | 100 | 2.54 | 97 | 99 | 75-125 | 2 | 20 |
| Zinc | 114 | 119 | 100 | 100 | 7.28 | 107 | 111 | 75-125 | 4 | 20 |



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 Samples Submitted: March 8, 2018
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 Project: 14-05806-000

DISSOLVED METALS
EPA 200.8

Matrix: Water
 Units: ug/L (ppb)

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|-------------------|----------------------|-----|-----------|---------------|---------------|-------|
| Client ID: | COLM-20180308 | | | | | |
| Laboratory ID: | 03-068-01 | | | | | |
| Copper | ND | 1.0 | EPA 200.8 | | 3-9-18 | |
| Zinc | ND | 5.0 | EPA 200.8 | | 3-9-18 | |

| | | | | | | |
|-------------------|-----------------------|-----|-----------|--|--------|--|
| Client ID: | COUMI-20180308 | | | | | |
| Laboratory ID: | 03-068-02 | | | | | |
| Copper | 1.5 | 1.0 | EPA 200.8 | | 3-9-18 | |
| Zinc | ND | 5.0 | EPA 200.8 | | 3-9-18 | |

| | | | | | | |
|-------------------|-----------------------|-----|-----------|--|--------|--|
| Client ID: | COUMO-20180308 | | | | | |
| Laboratory ID: | 03-068-03 | | | | | |
| Copper | 2.9 | 1.0 | EPA 200.8 | | 3-9-18 | |
| Zinc | 11 | 5.0 | EPA 200.8 | | 3-9-18 | |

| | | | | | | |
|-------------------|-----------------------|-----|-----------|--|--------|--|
| Client ID: | EVAMS-20180308 | | | | | |
| Laboratory ID: | 03-068-04 | | | | | |
| Copper | ND | 1.0 | EPA 200.8 | | 3-9-18 | |
| Zinc | ND | 5.0 | EPA 200.8 | | 3-9-18 | |

| | | | | | | |
|-------------------|------------------------|-----|-----------|--|--------|--|
| Client ID: | EVALSS-20180308 | | | | | |
| Laboratory ID: | 03-068-05 | | | | | |
| Copper | ND | 1.0 | EPA 200.8 | | 3-9-18 | |
| Zinc | ND | 5.0 | EPA 200.8 | | 3-9-18 | |

| | | | | | | |
|-------------------|-----------------------|-----|-----------|--|--------|--|
| Client ID: | MONMN-20180308 | | | | | |
| Laboratory ID: | 03-068-06 | | | | | |
| Copper | ND | 1.0 | EPA 200.8 | | 3-9-18 | |
| Zinc | ND | 5.0 | EPA 200.8 | | 3-9-18 | |

| | | | | | | |
|-------------------|-----------------------|-----|-----------|--|--------|--|
| Client ID: | MONMS-20180308 | | | | | |
| Laboratory ID: | 03-068-07 | | | | | |
| Copper | 1.7 | 1.0 | EPA 200.8 | | 3-9-18 | |
| Zinc | ND | 5.0 | EPA 200.8 | | 3-9-18 | |



Date of Report: March 23, 2018
 Samples Submitted: March 8, 2018
 Laboratory Reference: 1803-068
 Project: 14-05806-000

**DISSOLVED METALS
 EPA 200.8**

Matrix: Water
 Units: ug/L (ppb)

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|-------------------|----------------------|-----|-----------|---------------|---------------|-------|
| Client ID: | MONM-20180308 | | | | | |
| Laboratory ID: | 03-068-08 | | | | | |
| Copper | 1.1 | 1.0 | EPA 200.8 | | 3-9-18 | |
| Zinc | 6.9 | 5.0 | EPA 200.8 | | 3-9-18 | |

| | | | | | | |
|-------------------|-----------------------|-----|-----------|--|--------|--|
| Client ID: | SEIMN-20180308 | | | | | |
| Laboratory ID: | 03-068-09 | | | | | |
| Copper | ND | 1.0 | EPA 200.8 | | 3-9-18 | |
| Zinc | ND | 5.0 | EPA 200.8 | | 3-9-18 | |

| | | | | | | |
|-------------------|-----------------------|-----|-----------|--|--------|--|
| Client ID: | SEIMS-20180308 | | | | | |
| Laboratory ID: | 03-068-10 | | | | | |
| Copper | ND | 1.0 | EPA 200.8 | | 3-9-18 | |
| Zinc | ND | 5.0 | EPA 200.8 | | 3-9-18 | |

| | | | | | | |
|-------------------|-----------------------|-----|-----------|--|--------|--|
| Client ID: | TOSMI-20180308 | | | | | |
| Laboratory ID: | 03-068-11 | | | | | |
| Copper | 5.5 | 1.0 | EPA 200.8 | | 3-9-18 | |
| Zinc | 26 | 5.0 | EPA 200.8 | | 3-9-18 | |

| | | | | | | |
|-------------------|-----------------------|-----|-----------|--|--------|--|
| Client ID: | TOSMO-20180308 | | | | | |
| Laboratory ID: | 03-068-12 | | | | | |
| Copper | 3.9 | 1.0 | EPA 200.8 | | 3-9-18 | |
| Zinc | 14 | 5.0 | EPA 200.8 | | 3-9-18 | |

| | | | | | | |
|-------------------|-----------------------|-----|-----------|--|--------|--|
| Client ID: | TYLMI-20180308 | | | | | |
| Laboratory ID: | 03-068-13 | | | | | |
| Copper | 2.4 | 1.0 | EPA 200.8 | | 3-9-18 | |
| Zinc | 5.1 | 5.0 | EPA 200.8 | | 3-9-18 | |

| | | | | | | |
|-------------------|-----------------------|-----|-----------|--|--------|--|
| Client ID: | TYLMO-20180308 | | | | | |
| Laboratory ID: | 03-068-14 | | | | | |
| Copper | 3.4 | 1.0 | EPA 200.8 | | 3-9-18 | |
| Zinc | ND | 5.0 | EPA 200.8 | | 3-9-18 | |



Date of Report: March 23, 2018
Samples Submitted: March 8, 2018
Laboratory Reference: 1803-068
Project: 14-05806-000

DISSOLVED METALS
EPA 200.8

Matrix: Water
Units: ug/L (ppb)

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|-------------------|----------------------|------------|---------------|----------------------|----------------------|--------------|
| Client ID: | QA47-20180308 | | | | | |
| Laboratory ID: | 03-068-15 | | | | | |
| Copper | 1.5 | 1.0 | EPA 200.8 | | 3-9-18 | |
| Zinc | ND | 5.0 | EPA 200.8 | | 3-9-18 | |



Date of Report: March 23, 2018
 Samples Submitted: March 8, 2018
 Laboratory Reference: 1803-068
 Project: 14-05806-000

**DISSOLVED METALS
 EPA 200.8
 QUALITY CONTROL**

Matrix: Water
 Units: ug/L (ppb)

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|---------------------|-----------|-----|-----------|---------------|---------------|-------|
| METHOD BLANK | | | | | | |
| Laboratory ID: | MB0309D1 | | | | | |
| Copper | ND | 1.0 | EPA 200.8 | | 3-9-18 | |
| Zinc | ND | 5.0 | EPA 200.8 | | 3-9-18 | |

| Analyte | Result | Spike Level | Source Result | Percent Recovery | Recovery Limits | RPD | RPD Limit | Flags |
|------------------|-------------|-------------|---------------|------------------|-----------------|-----|-----------|-------|
| DUPLICATE | | | | | | | | |
| Laboratory ID: | 03-068-15 | | | | | | | |
| | ORIG | DUP | | | | | | |
| Copper | 1.49 | 1.54 | NA | NA | NA | NA | 4 | 20 |
| Zinc | ND | ND | NA | NA | NA | NA | NA | 20 |

MATRIX SPIKES

| | | | | | | | | | | |
|----------------|-------------|-------------|------|------|------|------------|------------|--------|---|----|
| Laboratory ID: | 03-068-15 | | | | | | | | | |
| | MS | MSD | MS | MSD | | MS | MSD | | | |
| Copper | 79.4 | 79.6 | 80.0 | 80.0 | 1.49 | 97 | 98 | 75-125 | 0 | 20 |
| Zinc | 84.8 | 82.8 | 80.0 | 80.0 | ND | 106 | 104 | 75-125 | 2 | 20 |





Data Qualifiers and Abbreviations

- A - Due to a high sample concentration, the amount spiked is insufficient for meaningful MS/MSD recovery data.
 - B - The analyte indicated was also found in the blank sample.
 - C - The duplicate RPD is outside control limits due to high result variability when analyte concentrations are within five times the quantitation limit.
 - E - The value reported exceeds the quantitation range and is an estimate.
 - F - Surrogate recovery data is not available due to the high concentration of coeluting target compounds.
 - H - The analyte indicated is a common laboratory solvent and may have been introduced during sample preparation, and be impacting the sample result.
 - I - Compound recovery is outside of the control limits.
 - J - The value reported was below the practical quantitation limit. The value is an estimate.
 - K - Sample duplicate RPD is outside control limits due to sample inhomogeneity. The sample was re-extracted and re-analyzed with similar results.
 - L - The RPD is outside of the control limits.
 - M - Hydrocarbons in the gasoline range are impacting the diesel range result.
 - M1 - Hydrocarbons in the gasoline range (toluene-naphthalene) are present in the sample.
 - N - Hydrocarbons in the lube oil range are impacting the diesel range result.
 - N1 - Hydrocarbons in diesel range are impacting lube oil range results.
 - O - Hydrocarbons indicative of heavier fuels are present in the sample and are impacting the gasoline result.
 - P - The RPD of the detected concentrations between the two columns is greater than 40.
 - Q - Surrogate recovery is outside of the control limits.
 - S - Surrogate recovery data is not available due to the necessary dilution of the sample.
 - T - The sample chromatogram is not similar to a typical _____.
 - U - The analyte was analyzed for, but was not detected above the reported sample quantitation limit.
 - U1 - The practical quantitation limit is elevated due to interferences present in the sample.
 - V - Matrix Spike/Matrix Spike Duplicate recoveries are outside control limits due to matrix effects.
 - W - Matrix Spike/Matrix Spike Duplicate RPD are outside control limits due to matrix effects.
 - X - Sample extract treated with a mercury cleanup procedure.
 - X1 - Sample extract treated with a sulfuric acid/silica gel cleanup procedure.
 - Y - The calibration verification for this analyte exceeded the 20% drift specified in method 8260C, and therefore the reported result should be considered an estimate. The overall performance of the calibration verification standard met the acceptance criteria of the method.
 - Z -
- ND - Not Detected at PQL
 PQL - Practical Quantitation Limit
 RPD - Relative Percent Difference





Am Test Inc.
13600 NE 126TH PL
Suite C
Kirkland, WA 98034
(425) 885-1664

**Professional
Analytical
Services**

Mar 23 2018
On-Site Environmental
14648 NE 95th ST
Redmond, WA 98052
Attention: David Baumeister

Dear David Baumeister:

Enclosed please find the analytical data for your REDMOND PAIRED WATERSHED STUDY project.

The following is a cross correlation of client and laboratory identifications for your convenience.

| CLIENT ID | MATRIX | AMTEST ID | TEST |
|-----------------|--------|------------|------------|
| COLM-20180308 | Water | 18-A003925 | Micro, NUT |
| COLUMI-20180308 | Water | 18-A003926 | Micro, NUT |
| COUMO-20180308 | Water | 18-A003927 | Micro, NUT |
| EVAMS-20180308 | Water | 18-A003928 | Micro, NUT |
| EVALSS-20180308 | Water | 18-A003929 | Micro, NUT |
| MONMN-20180308 | Water | 18-A003930 | Micro, NUT |
| MONMS-20180308 | Water | 18-A003931 | Micro, NUT |
| MONM-20180308 | Water | 18-A003932 | Micro, NUT |
| SEIMN-20180308 | Water | 18-A003933 | Micro, NUT |
| SEIMS-20180308 | Water | 18-A003934 | Micro, NUT |
| TOSMI-20180308 | Water | 18-A003935 | Micro, NUT |
| TOSMO-20180308 | Water | 18-A003936 | Micro, NUT |
| TYLMI-20180308 | Water | 18-A003937 | Micro, NUT |
| TYLMO-20180308 | Water | 18-A003938 | Micro, NUT |
| QA-20180308 | Water | 18-A003939 | Micro, NUT |

Your samples were received on Thursday, March 8, 2018. At the time of receipt, the samples were logged in and properly maintained prior to the subsequent analysis.

The analytical procedures used at AmTest are well documented and are typically derived from the protocols of the EPA, USDA, FDA or the Army Corps of Engineers.

Following the analytical data you will find the Quality Control (QC) results.

Please note that the detection limits that are listed in the body of the report refer to the Practical Quantitation Limits (PQL's), as opposed to the Method Detection Limits (MDL's).

Am Test Inc.
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Suite C
Kirkland, WA 98034
(425) 885-1664

**Professional
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Services**

Mar 23 2018
On-Site Environmental
continued . . .

If you should have any questions pertaining to the data package, please feel free to contact me.

Sincerely,


Aaron W. Young
Laboratory Manager

Project #: 14-05806-000
PO Number: 03-068

BACT = Bacteriological
CONV = Conventional

MET = Metals
ORG = Organics

NUT=Nutrients
DEM=Demand

MIN=Minerals

Am Test Inc.
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ANALYSIS REPORT

On-Site Environmental
14648 NE 95th ST
Redmond, WA 98052
Attention: David Baumeister
Project Name: REDMOND PAIRED WATERSHED STUDY
Project #: 14-05806-000
PO Number: 03-068
All results reported on an as received basis.

Date Received: 03/08/18
Date Reported: 3/23/18

AMTEST Identification Number 18-A003925
Client Identification COLM-20180308
Sampling Date 03/08/18, 13:15

Results

| PARAMETER | RESULT | UNITS | Q | D.L. | METHOD | ANALYST | DATE |
|--------------------------|--------|------------|---|------|-----------|---------|----------|
| Fecal Coliform | 5. | CFU/100 ml | | 1 | SM 9222D | JM | 03/09/18 |
| Total Nitrogen (NOX&TKN) | 0.40 | mg/l | | 0.1 | | | |
| Total Nitrogen (TKN) | 0.337 | mg/l | | 0.1 | SM4500N | JC | 03/16/18 |
| Nitrate + Nitrite | 0.067 | mg/l | | 0.01 | SM4500NO3 | JC | 03/14/18 |

AMTEST Identification Number **18-A003926**
Client Identification **COUMI-20180308**
Sampling Date **03/08/18, 11:20**

Results

| PARAMETER | RESULT | UNITS | Q | D.L. | METHOD | ANALYST | DATE |
|--------------------------|--------|------------|---|------|-----------|---------|----------|
| Fecal Coliform | 90. | CFU/100 ml | | 1 | SM 9222D | JM | 03/09/18 |
| Total Nitrogen (NOX&TKN) | 0.42 | mg/l | | 0.1 | | | |
| Total Nitrogen (TKN) | 0.164 | mg/l | | 0.1 | SM4500N | JC | 03/16/18 |
| Nitrate + Nitrite | 0.26 | mg/l | | 0.01 | SM4500NO3 | JC | 03/14/18 |

AMTEST Identification Number **18-A003927**
Client Identification **COUMO-20180308**
Sampling Date **03/08/18, 11:00**

Results

| PARAMETER | RESULT | UNITS | Q | D.L. | METHOD | ANALYST | DATE |
|--------------------------|--------|------------|---|------|-----------|---------|----------|
| Fecal Coliform | 210 | CFU/100 ml | | 1 | SM 9222D | JM | 03/09/18 |
| Total Nitrogen (NOX&TKN) | 0.73 | mg/l | | 0.1 | | | |
| Total Nitrogen (TKN) | 0.370 | mg/l | | 0.1 | SM4500N | JC | 03/16/18 |
| Nitrate + Nitrite | 0.36 | mg/l | | 0.01 | SM4500NO3 | JC | 03/14/18 |

AMTEST Identification Number **18-A003928**
Client Identification **EVAMS-20180308**
Sampling Date **03/08/18, 11:30**

Results

| PARAMETER | RESULT | UNITS | Q | D.L. | METHOD | ANALYST | DATE |
|--------------------------|--------|------------|---|------|-----------|---------|----------|
| Fecal Coliform | 20. | CFU/100 ml | | 1 | SM 9222D | JM | 03/09/18 |
| Total Nitrogen (NOX&TKN) | 2.20 | mg/l | | 0.1 | | | |
| Total Nitrogen (TKN) | 0.304 | mg/l | | 0.1 | SM4500N | JC | 03/16/18 |
| Nitrate + Nitrite | 1.9 | mg/l | | 0.01 | SM4500NO3 | JC | 03/14/18 |

AMTEST Identification Number **18-A003929**
Client Identification **EVALSS-20180308**
Sampling Date **03/08/18, 11:45**

Results

| PARAMETER | RESULT | UNITS | Q | D.L. | METHOD | ANALYST | DATE |
|--------------------------|--------|------------|---|------|-----------|---------|----------|
| Fecal Coliform | 10. | CFU/100 ml | | 1 | SM 9222D | JM | 03/09/18 |
| Total Nitrogen (NOX&TKN) | 1.72 | mg/l | | 0.1 | | | |
| Total Nitrogen (TKN) | 0.222 | mg/l | | 0.1 | SM4500N | JC | 03/16/18 |
| Nitrate + Nitrite | 1.5 | mg/l | | 0.01 | SM4500NO3 | JC | 03/14/18 |

AMTEST Identification Number **18-A003930**
Client Identification **MONMN-20180308**
Sampling Date **03/08/18, 12:50**

Results

| PARAMETER | RESULT | UNITS | Q | D.L. | METHOD | ANALYST | DATE |
|--------------------------|--------|------------|---|------|-----------|---------|----------|
| Fecal Coliform | 55. | CFU/100 ml | | 1 | SM 9222D | JM | 03/09/18 |
| Total Nitrogen (NOX&TKN) | 0.36 | mg/l | | 0.1 | | | |
| Total Nitrogen (TKN) | 0.205 | mg/l | | 0.1 | SM4500N | JC | 03/16/18 |
| Nitrate + Nitrite | 0.16 | mg/l | | 0.01 | SM4500NO3 | JC | 03/14/18 |

AMTEST Identification Number **18-A003931**
Client Identification **MONMS-20180308**
Sampling Date **03/08/18, 13:10**

Results

| PARAMETER | RESULT | UNITS | Q | D.L. | METHOD | ANALYST | DATE |
|--------------------------|--------|------------|---|------|-----------|---------|----------|
| Fecal Coliform | 190 | CFU/100 ml | | 1 | SM 9222D | JM | 03/09/18 |
| Total Nitrogen (NOX&TKN) | 0.85 | mg/l | | 0.1 | | | |
| Total Nitrogen (TKN) | 0.307 | mg/l | | 0.1 | SM4500N | JC | 03/16/18 |
| Nitrate + Nitrite | 0.54 | mg/l | | 0.01 | SM4500NO3 | JC | 03/14/18 |

AMTEST Identification Number **18-A003932**
Client Identification **MONM-20180308**
Sampling Date **03/08/18, 13:40**

Results

| PARAMETER | RESULT | UNITS | Q | D.L. | METHOD | ANALYST | DATE |
|--------------------------|--------|------------|---|------|-----------|---------|----------|
| Fecal Coliform | 10. | CFU/100 ml | | 1 | SM 9222D | JM | 03/09/18 |
| Total Nitrogen (NOX&TKN) | 0.56 | mg/l | | 0.1 | | | |
| Total Nitrogen (TKN) | 0.211 | mg/l | | 0.1 | SM4500N | JC | 03/16/18 |
| Nitrate + Nitrite | 0.35 | mg/l | | 0.01 | SM4500NO3 | JC | 03/14/18 |

AMTEST Identification Number **18-A003933**
Client Identification **SEIMN-20180308**
Sampling Date **03/08/18, 12:45**

Results

| PARAMETER | RESULT | UNITS | Q | D.L. | METHOD | ANALYST | DATE |
|--------------------------|--------|------------|---|------|-----------|---------|----------|
| Fecal Coliform | 15. | CFU/100 ml | | 1 | SM 9222D | JM | 03/09/18 |
| Total Nitrogen (NOX&TKN) | 0.37 | mg/l | | 0.1 | | | |
| Total Nitrogen (TKN) | 0.190 | mg/l | | 0.1 | SM4500N | JC | 03/16/18 |
| Nitrate + Nitrite | 0.18 | mg/l | | 0.01 | SM4500NO3 | JC | 03/14/18 |

AMTEST Identification Number 18-A003934
Client Identification SEIMS-20180308
Sampling Date 03/08/18, 13:40

Results

| PARAMETER | RESULT | UNITS | Q | D.L. | METHOD | ANALYST | DATE |
|--------------------------|--------|------------|---|------|-----------|---------|----------|
| Fecal Coliform | 400 | CFU/100 ml | | 1 | SM 9222D | JM | 03/09/18 |
| Total Nitrogen (NOX&TKN) | 0.71 | mg/l | | 0.1 | | | |
| Total Nitrogen (TKN) | 0.488 | mg/l | | 0.1 | SM4500N | JC | 03/16/18 |
| Nitrate + Nitrite | 0.22 | mg/l | | 0.01 | SM4500NO3 | JC | 03/14/18 |

AMTEST Identification Number 18-A003935
Client Identification TOSMI-20180308
Sampling Date 03/08/18, 11:10

Results

| PARAMETER | RESULT | UNITS | Q | D.L. | METHOD | ANALYST | DATE |
|--------------------------|--------|------------|---|------|-----------|---------|----------|
| Fecal Coliform | 260 | CFU/100 ml | | 1 | SM 9222D | JM | 03/09/18 |
| Total Nitrogen (NOX&TKN) | 0.83 | mg/l | | 0.1 | | | |
| Total Nitrogen (TKN) | 0.364 | mg/l | | 0.1 | SM4500N | JC | 03/16/18 |
| Nitrate + Nitrite | 0.47 | mg/l | | 0.01 | SM4500NO3 | JC | 03/14/18 |

AMTEST Identification Number 18-A003936
Client Identification TOSMO-20180308
Sampling Date 03/08/18, 11:40

Results

| PARAMETER | RESULT | UNITS | Q | D.L. | METHOD | ANALYST | DATE |
|--------------------------|--------|------------|---|------|-----------|---------|----------|
| Fecal Coliform | 370 | CFU/100 ml | | 1 | SM 9222D | JM | 03/09/18 |
| Total Nitrogen (NOX&TKN) | 0.89 | mg/l | | 0.1 | | | |
| Total Nitrogen (TKN) | 0.377 | mg/l | | 0.1 | SM4500N | JC | 03/16/18 |
| Nitrate + Nitrite | 0.51 | mg/l | | 0.01 | SM4500NO3 | JC | 03/14/18 |

AMTEST Identification Number 18-A003937
Client Identification TYLMI-20180308
Sampling Date 03/08/18, 12:25

Results

| PARAMETER | RESULT | UNITS | Q | D.L. | METHOD | ANALYST | DATE |
|--------------------------|--------|------------|---|------|-----------|---------|----------|
| Fecal Coliform | 5. | CFU/100 ml | | 1 | SM 9222D | JM | 03/09/18 |
| Total Nitrogen (NOX&TKN) | 0.93 | mg/l | | 0.1 | | | |
| Total Nitrogen (TKN) | 0.261 | mg/l | | 0.1 | SM4500N | JC | 03/16/18 |
| Nitrate + Nitrite | 0.67 | mg/l | | 0.01 | SM4500NO3 | JC | 03/14/18 |

AMTEST Identification Number 18-A003938
Client Identification TYLMO-20180308
Sampling Date 03/08/18, 12:05


Results

| PARAMETER | RESULT | UNITS | Q | D.L. | METHOD | ANALYST | DATE |
|--------------------------|--------|------------|---|------|-----------|---------|----------|
| Fecal Coliform | 140 | CFU/100 ml | | 1 | SM 9222D | JM | 03/09/18 |
| Total Nitrogen (NOX&TKN) | 0.67 | mg/l | | 0.1 | | | |
| Total Nitrogen (TKN) | 0.367 | mg/l | | 0.1 | SM4500N | JC | 03/16/18 |
| Nitrate + Nitrite | 0.30 | mg/l | | 0.01 | SM4500NO3 | JC | 03/14/18 |

AMTEST Identification Number 18-A003939
Client Identification QA-20180308
Sampling Date 03/08/18, 12:40

Results

| PARAMETER | RESULT | UNITS | Q | D.L. | METHOD | ANALYST | DATE |
|--------------------------|--------|------------|---|------|-----------|---------|----------|
| Fecal Coliform | 95. | CFU/100 ml | | 1 | SM 9222D | JM | 03/09/18 |
| Total Nitrogen (NOX&TKN) | 0.45 | mg/l | | 0.1 | | | |
| Total Nitrogen (TKN) | 0.176 | mg/l | | 0.1 | SM4500N | JC | 03/16/18 |
| Nitrate + Nitrite | 0.27 | mg/l | | 0.01 | SM4500NO3 | JC | 03/14/18 |


Aaron W. Young
Laboratory Manager

QC Summary for sample numbers: 18-A003925 to 18-A003939

DUPLICATES

| SAMPLE # | ANALYTE | UNITS | SAMPLE VALUE | DUP VALUE | RPD |
|------------|----------------------|------------|--------------|-----------|------|
| 18-A003899 | Fecal Coliform | CFU/100 ml | 1100 | 1100 | 0.00 |
| 18-A003905 | Fecal Coliform | CFU/100 ml | 290 | 250 | 15. |
| 18-A003927 | Fecal Coliform | CFU/100 ml | 210 | 250 | 17. |
| 18-A003939 | Fecal Coliform | CFU/100 ml | 95. | 90. | 5.4 |
| 18-A003860 | Total Nitrogen (TKN) | mg/l | 0.565 | 0.633 | 11. |
| 18-A003926 | Total Nitrogen (TKN) | mg/l | 0.164 | 0.184 | 11. |
| 18-A003938 | Total Nitrogen (TKN) | mg/l | 0.367 | 0.462 | 23. |
| 18-A004232 | Total Nitrogen (TKN) | mg/l | 0.126 | 0.125 | 0.80 |
| 18-A003486 | Nitrate + Nitrite | mg/l | 1.9 | 1.9 | 0.00 |
| 18-A003498 | Nitrate + Nitrite | mg/l | 0.40 | 0.39 | 2.5 |
| 18-A003554 | Nitrate + Nitrite | mg/l | 0.046 | 0.041 | 11. |
| 18-A003711 | Nitrate + Nitrite | mg/l | 1.8 | 1.8 | 0.00 |
| 18-A003721 | Nitrate + Nitrite | mg/l | 2.1 | 2.2 | 4.7 |
| 18-A003823 | Nitrate + Nitrite | mg/l | 0.51 | 0.51 | 0.00 |
| 18-A003929 | Nitrate + Nitrite | mg/l | 1.5 | 1.5 | 0.00 |
| 18-A003939 | Nitrate + Nitrite | mg/l | 0.27 | 0.26 | 3.8 |
| 18-A004227 | Nitrate + Nitrite | mg/l | 0.91 | 0.92 | 1.1 |
| 18-A004252 | Nitrate + Nitrite | mg/l | 0.67 | 0.69 | 2.9 |

MATRIX SPIKES

| SAMPLE # | ANALYTE | UNITS | SAMPLE VALUE | SMPL+ SPK | SPK AMT | RECOVERY |
|------------|----------------------|-------|--------------|-----------|---------|----------|
| 18-A003926 | Total Nitrogen (TKN) | mg/l | 0.164 | 1.13 | 1.00 | 96.60 % |
| 18-A003938 | Total Nitrogen (TKN) | mg/l | 0.367 | 1.23 | 1.00 | 86.30 % |
| 18-A004232 | Total Nitrogen (TKN) | mg/l | 0.126 | 0.958 | 1.00 | 83.20 % |
| 18-A003486 | Nitrate + Nitrite | mg/l | 1.9 | 6.5 | 5.0 | 92.00 % |
| 18-A003498 | Nitrate + Nitrite | mg/l | 0.40 | 1.3 | 1.0 | 90.00 % |
| 18-A003554 | Nitrate + Nitrite | mg/l | 0.046 | 0.99 | 1.0 | 94.40 % |
| 18-A003711 | Nitrate + Nitrite | mg/l | 1.8 | 6.5 | 5.0 | 94.00 % |
| 18-A003721 | Nitrate + Nitrite | mg/l | 2.1 | 6.8 | 5.0 | 94.00 % |
| 18-A003823 | Nitrate + Nitrite | mg/l | 0.51 | 1.4 | 1.0 | 89.00 % |
| 18-A003929 | Nitrate + Nitrite | mg/l | 1.5 | 6.3 | 5.0 | 96.00 % |
| 18-A003939 | Nitrate + Nitrite | mg/l | 0.27 | 1.2 | 1.0 | 93.00 % |
| 18-A004227 | Nitrate + Nitrite | mg/l | 0.91 | 2.0 | 1.0 | 109.00 % |
| 18-A004252 | Nitrate + Nitrite | mg/l | 0.67 | 1.7 | 1.0 | 103.00 % |

QC Summary for sample numbers: 18-A003925 to 18-A003939...

STANDARD REFERENCE MATERIALS

| ANALYTE | UNITS | TRUE VALUE | MEASURED VALUE | RECOVERY |
|----------------------|-------|------------|----------------|----------|
| Total Nitrogen (TKN) | mg/l | 1.00 | 1.11 | 111. % |
| Total Nitrogen (TKN) | mg/l | 1.00 | 1.10 | 110. % |
| Nitrate + Nitrite | mg/l | 1.0 | 0.97 | 97.0 % |
| Nitrate + Nitrite | mg/l | 1.0 | 0.97 | 97.0 % |
| Nitrate + Nitrite | mg/l | 1.0 | 0.97 | 97.0 % |
| Nitrate + Nitrite | mg/l | 1.0 | 0.95 | 95.0 % |
| Nitrate + Nitrite | mg/l | 1.0 | 0.94 | 94.0 % |
| Nitrate + Nitrite | mg/l | 1.0 | 0.95 | 95.0 % |
| Nitrate + Nitrite | mg/l | 1.0 | 0.97 | 97.0 % |
| Nitrate + Nitrite | mg/l | 1.0 | 0.96 | 96.0 % |
| Nitrate + Nitrite | mg/l | 1.0 | 0.96 | 96.0 % |
| Nitrate + Nitrite | mg/l | 1.0 | 0.95 | 95.0 % |
| Nitrate + Nitrite | mg/l | 1.0 | 1.0 | 100. % |
| Nitrate + Nitrite | mg/l | 1.0 | 0.95 | 95.0 % |

BLANKS

| ANALYTE | UNITS | RESULT |
|----------------------|------------|--------|
| Fecal Coliform | CFU/100 ml | < 1 |
| Fecal Coliform | CFU/100 ml | < 1 |
| Fecal Coliform | CFU/100 ml | < 1 |
| Fecal Coliform | CFU/100 ml | < 1 |
| Total Nitrogen (TKN) | mg/l | < 0.1 |
| Total Nitrogen (TKN) | mg/l | < 0.1 |
| Nitrate + Nitrite | mg/l | < 0.01 |
| Nitrate + Nitrite | mg/l | < 0.01 |
| Nitrate + Nitrite | mg/l | < 0.01 |
| Nitrate + Nitrite | mg/l | < 0.01 |
| Nitrate + Nitrite | mg/l | < 0.01 |
| Nitrate + Nitrite | mg/l | < 0.01 |
| Nitrate + Nitrite | mg/l | < 0.01 |
| Nitrate + Nitrite | mg/l | < 0.01 |
| Nitrate + Nitrite | mg/l | < 0.01 |
| Nitrate + Nitrite | mg/l | < 0.01 |
| Nitrate + Nitrite | mg/l | < 0.01 |
| Nitrate + Nitrite | mg/l | < 0.01 |



14648 NE 95th Street, Redmond, WA 98052 · (425) 883-3881

Laboratory: AmTest Laboratories

Attention: Aaron Young

13600 NE 126th PI Kirkland, WA 98034

Phone Number: (425) 885-1664

Turnaround Request

1 Day 2 Day 3 Day

Standard

Other: _____

Laboratory Reference #: 03-068

Project Manager: Blair Goodrow

email: bgoodrow@onsite-env.com

Project Number: 14-05806-000

Project Name: Redmond Paired Watershed Study

| Lab ID | Sample Identification | Date Sampled | Time Sampled | Matrix | # of Cont. | Requested Analyses |
|-------------------------------------|-----------------------|--------------|--------------|--------|------------|--|
| 1 | COLM-20180308 3925 | 3/8/17 | 1315 | Water | 2 | Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N |
| 2 | COUMI-20180308 26 | 3/8/17 | 1120 | Water | 2 | Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N |
| 3 | COUMO-20180308 27 | 3/8/17 | 1100 | Water | 2 | Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N |
| 4 | EVAMS-20180308 28 | 3/8/17 | 1130 | Water | 2 | Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N |
| 5 | EVALSS-20180308 29 | 3/8/17 | 1145 | Water | 2 | Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N |
| 6 | MONMN-20180308 30 | 3/8/17 | 1250 | Water | 2 | Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N |
| 7 | MONMS-20180308 31 | 3/8/17 | 1310 | Water | 2 | Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N |
| 8 | MONM-20180308 32 | 3/8/17 | 1340 | Water | 2 | Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N |
| 9 | SEIMN-20180308 33 | 3/8/17 | 1245 | Water | 2 | Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N |
| 10 | SEIMS-20180308 34 | 3/8/17 | 1340 | Water | 2 | Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N |
| Signature | | Company | | Date | Time | Comments/Special Instructions |
| Relinquished by: <i>[Signature]</i> | | OSE | | 3/8/18 | 3:15 | EDDs - CSV Reporting Limits: Fecal Coliform - 1.0 cfu/100ml Total Nitrogen - .10 mg/L |
| Received by: <i>[Signature]</i> | | AMTEST T=4.8 | | 3/8/18 | 3:15 | |
| Relinquished by: | | | | | | |
| Received by: | | | | | | |
| Relinquished by: | | | | | | |
| Received by: | | | | | | |

AMTEST P/U



14648 NE 95th Street, Redmond, WA 98052 · (425) 883-3881

Laboratory: AmTest Laboratories

Attention: Aaron Young

13600 NE 126th PI Kirkland, WA 98034

Phone Number: (425) 885-1664

Turnaround Request

1 Day 2 Day 3 Day

Standard

Other: _____

Laboratory Reference #: 03-068

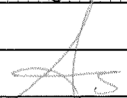
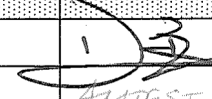
Project Manager: Blair Goodrow

email: bgoodrow@onsite-env.com

Project Number: 14-05806-000

Project Name: Redmond Paired Watershed Study

| Lab ID | Sample Identification | Date Sampled | Time Sampled | Matrix | # of Cont. | Requested Analyses |
|--------|-----------------------|--------------|--------------|--------|------------|---|
| 11 | TOSM-20180308 3935 | 3/8/18 | 1110 | Water | 2 | Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N |
| 12 | TOSM-20180308 36 | 3/8/18 | 1140 | Water | 2 | Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N |
| 13 | TYLMI-20180308 37 | 3/8/18 | 1225 | Water | 2 | Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N |
| 14 | TYLMO-20180308 38 | 3/8/18 | 1205 | Water | 2 | Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N |
| 15 | QA47-20180308 39 | 3/8/18 | 1240 | Water | 2 | Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |

| Signature | Company | Date | Time | Comments/Special Instructions |
|--|---|--------|------|--|
| Relinquished by:  |  AMTEST | 3/8/18 | 3:15 | EDDs - CSV Reporting Limits: Fecal Coliform - 1.0 cfu/100ml Total Nitrogen - .10 mg/L |
| Received by: | | 3/8/18 | 3:15 | |
| Relinquished by: | | | | |
| Received by: | | | | |
| Relinquished by: | | | | |
| Received by: | | | | |



14648 NE 95th Street, Redmond, WA 98052
Telephone: 425.883.3881

Company: Herrera Environmental Consultants
Project No.: 14-05806-000
Project Name: Redmond Paired Watershed Study
Project Manager: George Iftner

CHAIN OF CUSTODY

Turnaround Requested:

- 1 Day
- 2 Day
- 3 Day
- Standard

Laboratory No.

03-068

Requested Analyses

| Total Suspended Solids (SM 2540D) | Turbidity (EPA 181.1) | Hardness (EPA 200.7 / SM 2340B) | Dissolved Organ Carbon (SM 5310B) * | Fecal Coliform (SM 922D) | Total Phosphorus (EPA 365.1) | Total Nitrogen (SM 4500 N-B) | Total Cu and Zn (EPA 200.8) | Dissolved Cu and Zn (EPA 200.8) * | | | | | | |
|-----------------------------------|-----------------------|---------------------------------|-------------------------------------|--------------------------|------------------------------|------------------------------|-----------------------------|-----------------------------------|--|--|--|--|--|--|
|-----------------------------------|-----------------------|---------------------------------|-------------------------------------|--------------------------|------------------------------|------------------------------|-----------------------------|-----------------------------------|--|--|--|--|--|--|

| Lab ID | Sample Identification | Date Sampled | Time Sampled | Matrix | # of Cont. | Total Suspended Solids (SM 2540D) | Turbidity (EPA 181.1) | Hardness (EPA 200.7 / SM 2340B) | Dissolved Organ Carbon (SM 5310B) * | Fecal Coliform (SM 922D) | Total Phosphorus (EPA 365.1) | Total Nitrogen (SM 4500 N-B) | Total Cu and Zn (EPA 200.8) | Dissolved Cu and Zn (EPA 200.8) * | | | | | | | |
|--------|-----------------------|--------------|--------------|--------|------------|-----------------------------------|-----------------------|---------------------------------|-------------------------------------|--------------------------|------------------------------|------------------------------|-----------------------------|-----------------------------------|---|--|--|--|--|--|--|
| 1 | COLM-2018 0308 | 3/8/18 | 1315 | Water | 7 | X | X | X | X | X | X | X | X | X | | | | | | | |
| 2 | COUMI-2018 0308 | ↓ | 1120 | Water | 7 | X | X | X | X | X | X | X | X | X | | | | | | | |
| 3 | COUMO-2018 0308 | | 1100 | Water | 7 | X | X | X | X | X | X | X | X | X | X | | | | | | |
| 4 | EVAMS-2018 0308 | | 1130 | Water | 7 | X | X | X | X | X | X | X | X | X | X | | | | | | |
| 5 | EVALSS-2018 0308 | | 1145 | Water | 7 | X | X | X | X | X | X | X | X | X | X | | | | | | |
| 6 | MONMN-2018 0308 | | 1250 | Water | 7 | X | X | X | X | X | X | X | X | X | X | | | | | | |
| 7 | MONMS-2018 0308 | | 1310 | Water | 7 | X | X | X | X | X | X | X | X | X | X | | | | | | |
| 8 | MONM-2018 0308 | | 1310 | Water | 7 | X | X | X | X | X | X | X | X | X | X | | | | | | |
| 9 | SEIMN-2018 0308 | | 1245 | Water | 7 | X | X | X | X | X | X | X | X | X | X | | | | | | |
| 10 | SEIMS-2018 0308 | | 1340 | Water | 7 | X | X | X | X | X | X | X | X | X | X | | | | | | |
| 11 | TOSMI-2018 0308 | | 1110 | Water | 7 | X | X | X | X | X | X | X | X | X | X | | | | | | |
| 12 | TOSMO-2018 0308 | | 1140 | Water | 7 | X | X | X | X | X | X | X | X | X | X | | | | | | |
| 13 | TYLMI-2018 0308 | | 1225 | Water | 7 | X | X | X | X | X | X | X | X | X | X | | | | | | |
| 14 | TYLMO-2018 0308 | | 1205 | Water | 7 | X | X | X | X | X | X | X | X | X | X | | | | | | |
| 15 | QA47-2018 0308 | | 1240 | Water | 7 | X | X | X | X | X | X | X | X | X | X | | | | | | |

Relinquished by M. Mautner Date 3/8/18 Received by [Signature] Date 3/8/18
 Firm Herrera Time 1425 Firm OSE Time 1425
 Relinquished by _____ Date _____ Received by _____ Date _____
 Firm _____ Time _____ Firm _____ Time _____

Comments:
 * - field filtered with 0.45 µm filter within 15 minutes of collecting sample



14648 NE 95th Street, Redmond, WA 98052
Telephone: 425.883.3881

Company: Herrera Environmental Consultants
Project No.: 14-05806-000
Project Name: Redmond Paired Watershed Study
Project Manager: George Itner

CHAIN OF CUSTODY

Turnaround Requested:

1 Day

2 Day

3 Day

Standard

Laboratory No. 03-068

Requested Analyses

| Total Suspended Solids (SM 2540D) | Turbidity (EPA 181.1) | Hardness (EPA 200.7 / SM 2340B) | Dissolved Organ Carbon (SM 5310B) * | Fecal Coliform (SM 9222D) | Total Phosphorus (EPA 365.1) | Total Nitrogen (SM 4500 N-B) | Total Cu and Zn (EPA 200.8) | Dissolved Cu and Zn (EPA 200.8) * |
|-----------------------------------|-----------------------|---------------------------------|-------------------------------------|---------------------------|------------------------------|------------------------------|-----------------------------|-----------------------------------|
|-----------------------------------|-----------------------|---------------------------------|-------------------------------------|---------------------------|------------------------------|------------------------------|-----------------------------|-----------------------------------|

| Lab ID | Sample Identification | Date Sampled | Time Sampled | Matrix | # of Cont. | Total Suspended Solids (SM 2540D) | Turbidity (EPA 181.1) | Hardness (EPA 200.7 / SM 2340B) | Dissolved Organ Carbon (SM 5310B) * | Fecal Coliform (SM 9222D) | Total Phosphorus (EPA 365.1) | Total Nitrogen (SM 4500 N-B) | Total Cu and Zn (EPA 200.8) | Dissolved Cu and Zn (EPA 200.8) * |
|--------|-----------------------|--------------|--------------|--------|------------|-----------------------------------|-----------------------|---------------------------------|-------------------------------------|---------------------------|------------------------------|------------------------------|-----------------------------|-----------------------------------|
| 1 | COLM-2018 0308 | 3/8/18 | 1315 | Water | 7 | X | X | X | X | X | X | X | X | X |
| 2 | COUMI-2018 0308 | | 1120 | Water | 7 | X | X | X | X | X | X | X | X | X |
| 3 | COUMO-2018 0308 | | 1100 | Water | 7 | X | X | X | X | X | X | X | X | X |
| 4 | EVAMS-2018 0308 | | 1130 | Water | 7 | X | X | X | X | X | X | X | X | X |
| 5 | EVALSS-2018 0308 | | 1145 | Water | 7 | X | X | X | X | X | X | X | X | X |
| 6 | MONMN-2018 0308 | | 1250 | Water | 7 | X | X | X | X | X | X | X | X | X |
| 7 | MONMS-2018 0308 | | 1310 | Water | 7 | X | X | X | X | X | X | X | X | X |
| 8 | MONM-2018 0308 | | 1240 | Water | 7 | X | X | X | X | X | X | X | X | X |
| 9 | SEIMN-2018 0308 | | 1245 | Water | 7 | X | X | X | X | X | X | X | X | X |
| 10 | SEIMS-2018 0308 | | 1340 | Water | 7 | X | X | X | X | X | X | X | X | X |
| 11 | TOSMI-2018 0308 | | 1110 | Water | 7 | X | X | X | X | X | X | X | X | X |
| 12 | TOSMO-2018 0308 | | 1140 | Water | 7 | X | X | X | X | X | X | X | X | X |
| 13 | TYLMI-2018 0308 | | 1225 | Water | 7 | X | X | X | X | X | X | X | X | X |
| 14 | TYLMO-2018 0308 | | 1205 | Water | 7 | X | X | X | X | X | X | X | X | X |
| 15 | QA47-2018 0308 | | 1240 | Water | 7 | X | X | X | X | X | X | X | X | X |

Relinquished by M. Mautner Date 3/8/18 Received by [Signature] Date 3/8/18

Firm Herrera Time 1425 Firm OSE Time 1425

Relinquished by _____ Date _____ Received by _____ Date _____

Firm _____ Time _____ Firm _____ Time _____

Comments:
* - field filtered with 0.45 µm filter within 15 minutes of collecting sample

METER CALIBRATION LOG - Redmond Paired Watershed Study

| | | | |
|-----------------------------------|---------------|-------|------------|
| Project Number: | 14-05806-000 | | |
| Personnel Performing Calibration: | DB | | |
| Meter: | DSS#1 | | |
| Date/Time: | 3.7.18 / 1540 | | |
| Barometric Pressure Start of Day: | mmHg: | 750.3 | Time: 1540 |
| Barometric Pressure End of Day: | mmHg: | | Time: |

| |
|---|
| Calibration Procedures: |
| Rinse Multimeter Sonde Between Each Operation |
| Rinse 3 times with tap water, 3 times with deionized water, then 3 times with the solution to be used for calibrating or testing. |
| Conductivity Calibration Notes: |



| PRE Field Run CALIBRATION | Meter Reading | Buffer / Cal Std | Temp °C | Comments |
|---------------------------|---------------|------------------|---------|--------------|
| Conductivity (µS/cm) | 1.9 | 0 | 22.9 | lab DI water |
| Conductivity (µS/cm) | 999 | 1,000 | 23.0 | |
| Conductivity (µS/cm) | 100.5 | 100 | 22.7 | |
| DO % Saturation | 99.5 | 100 | 22.1 | |

1. Dry the conductivity probe with a lab tissue (e.g., KimWipes®) and DI water.
2. Fill calibration cup to within a centimeter of the top of the calibration cup with DI water (0 µS).
3. Fill the calibration cup with 1,000 µS standard so that the temperature/conductivity probe is submerged.
4. Make sure there are no bubbles in the cell; wait 2 minutes.
5. Enter the appropriate standard value (1,000 µS/cm or 1.0 mS/cm) for Sp Cond.
6. Check conductivity using 100 µS/cm standard.

| POST Field Run CHECK | Meter Reading | Buffer / Cal Std | Temp °C | Comments |
|----------------------|---------------|------------------|---------|------------------|
| Conductivity (µS/cm) | 8.8 | 0 | 22.4 | Herrera DI water |
| Conductivity (µS/cm) | 99.7 | 100 | 22.9 | |
| DO % Saturation | 100.3 | 100 | 21.6 | |

- Dissolved Oxygen Calibration Notes:**
1. Fill the calibration cup with about 1/2 inch of DI; it should be below the sensor cap.
 2. Use KimWipes® to dry any droplets from the sensor cap.
 3. Invert calibration cup's cap and gently rest it on the cup.
 4. Wait 5 minutes, making sure that temperature stabilizes.
 5. Determine local barometric pressure (mm Hg) and enter this value into the meter.
 6. Click "Calibrate". "Calibrate Successful" will be displayed.
 7. To retain calibration accuracy between measurements, store with the sensor immersed in water or within a water-saturated air environment such as a sealed storage cup with at least 10 ml of water.
 8. It is important to have the water-saturated air and the sensor at the same temperature. Therefore, store a jar of DI in the same environment as the sonde and calibrate in a similar air temperature as the water and sonde.
 9. Keep probe out of direct sun or wind.

METER CALIBRATION LOG - Redmond Paired Watershed Study

| | | | |
|-----------------------------------|------------------|-------|---------|
| Project Number: | 14-05806-000 | | |
| Personnel Performing Calibration: | VW | | |
| Meter: | YSI PRO DSS #2 | | |
| Date/Time: | 3/7/18 | | |
| Barometric Pressure Start of Day: | Inches Hg: 756.7 | Time: | 4:10:30 |
| Barometric Pressure End of Day: | Inches Hg: | Time: | |

| |
|---|
| Calibration Procedures: |
| Rinse Multimeter Sonde Between Each Operation |
| Rinse 3 times with tap water, 3 times with deionized water, then 3 times with the solution to be used for calibrating or testing. |
| Conductivity Calibration Notes: |



| PRE Field Run CALIBRATION | Meter Reading | Buffer / Cal Std | Temp °C | Comments |
|---------------------------|---------------|------------------|---------|------------------|
| Conductivity (µS/cm) | 11.3 | 0 | 23.3 | Herrera DI Water |
| Conductivity (µS/cm) | 1000 | 1,000 | 23.3 | |
| Conductivity (µS/cm) | 101.3 | 100 | 23.1 | |
| DO % Saturation | 99.1 | 100 | 22.0 | |

1. Dry the conductivity probe with a lab tissue (e.g., KimWipes®) and DI water.
2. Fill calibration cup to within a centimeter of the top of the calibration cup with DI water (0 µS).
3. Fill the calibration cup with 1,000 µS standard so that the temperature/conductivity probe is submerged.
4. Make sure there are no bubbles in the cell; wait 2 minutes.
5. Enter the appropriate standard value (1,000 µS/cm or 1.0 mS/cm) for Sp Cond.
6. Check conductivity using 100 µS/cm standard.

| POST Field Run CHECK | Meter Reading | Buffer / Cal Std | Temp °C | Comments |
|----------------------|---------------|------------------|---------|------------------|
| Conductivity (µS/cm) | 9.8 | 0 | 21.5 | Herrera DI Water |
| Conductivity (µS/cm) | 100.8 | 100 | 22.7 | |
| DO % Saturation | 98.7 | 100 | 22.2 | |

- | |
|---|
| Dissolved Oxygen Calibration Notes: |
| 1. Fill the calibration cup with about 1/2 inch of DI; it should be below the sensor cap. |
| 2. Use KimWipes® to dry any droplets from the sensor cap. |
| 3. Invert calibration cup's cap and gently rest it on the cup. |
| 4. Wait 5 minutes, making sure that temperature stabilizes. |
| 5. Determine local barometric pressure (mm Hg) and enter this value into the meter. |
| 6. Click "Calibrate". "Calibrate Successful" will be displayed. |
| 7. To retain calibration accuracy between measurements, store with the sensor immersed in water or within a water-saturated air environment such as a sealed storage cup with at least 10 ml of water. |
| 8. It is important to have the water-saturated air and the sensor at the same temperature. Therefore, store a jar of DI in the same environment as the sonde and calibrate in a similar air temperature as the water and sonde. |
| 9. Keep probe out of direct sun or wind. |

FIELD SAMPLING SHEET - Redmond Paired Watershed Study



Field Personnel: VW + GK

Sample Date: 03-08-2018

Sample Time: 1315

PDT: _____

SITE ID: COLM

Base Flow or Storm Event: Storm Event

Field Filtered Time: 1315

PST:

Project Number: 14-05806-000

(Must filter within 15 minutes of collection)

Project Name: Redmond Paired Watershed Study

Current Weather and Temp: Rain + 44°F

Water Quality Sampling

Sample ID: COLM 20180308

| Parameter | Bottle Type | Bottle Volume | # Bottles | Preservative | Duplicated? |
|---------------------------|-------------|---------------|-----------|--------------------------------|-------------|
| TSS and Turbidity | HDPE | 1L | 1 | NA | <u>NO</u> |
| DOC * | HDPE | 250 ml | 1 | HCL | <u>1</u> |
| Fecal Col. Bact. | HDPE | 250 ml | 1 | EDTA | <u>1</u> |
| T. Phosphorous | HDPE | 250 ml | 1 | H ₂ SO ₄ | <u>1</u> |
| T Nitrogen | HDPE | 250 ml | 1 | H ₂ SO ₄ | <u>1</u> |
| Diss. Cu and Zn * | HDPE | 250 ml | 1 | HNO ₃ | <u>1</u> |
| Hardness, Total Cu and Zn | HDPE | 500 ml | 1 | HNO ₃ | <u>1</u> |

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID: _____
 Filter blank sample ID: _____
 Transfer blank sample ID: _____

Visual and Olfactory Conditions:

Clarity: N/A
 Color: N/A
 Odor: N/A
 Sheen: N/A
 Floatables: Foam

LABORATORY DELIVERY

Date: _____ Time: _____

Quality Assurance

Checked By: T. Lovell Signature: _____

Date Checked: 5-23-18 Time: _____

Data Entered into Database? YES NO initials: _____

Date Entered: _____ Time: _____

Notes: _____

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

YSI Pro Plus (15D100020) _____

YSI Pro DSS 1 _____

YSI Pro DSS2 (circled) _____

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): 5.68

Reference Point (description): SG

Water Quality Measurements

Temperature (°C) 5.4

Specific Conductivity (µs/cm) 27.6

Dissolved Oxygen (mg/L) 11.71

FIELD SAMPLING SHEET - Redmond Paired Watershed Study



HERRERA

| | | | | |
|---|-----------------------------------|---------------------------|------------|------------------------------|
| Field Personnel: <u>BB</u> | Sample Date: <u>3.8.18</u> | Sample Time: <u>11:20</u> | PDT: _____ | SITE ID: <u>LOUM</u> |
| Base Flow or Storm Event? <u>Storm</u> | Field Filtered Time: <u>11:25</u> | PST: <u>X</u> | | Project Number: 14-05806-000 |
| (Must filter within 15 minutes of collection) | | | | |

Water Quality Sampling

Sample ID: LOUM-20180308

| Parameter | Bottle Type | Bottle Volume | # Bottles | Preservative | Duplicated? | |
|---------------------------|-------------|---------------|-----------|--------------------------------|-------------|---|
| TSS and Turbidity | HDPE | 1L | 1 | NA | Yes | |
| DOC * | HDPE | 250 ml | 1 | HCL | | |
| Fecal Col. Bact. | HDPE | 250 ml | 1 | EDTA | | |
| T. Phosphorous | HDPE | 250 ml | 1 | H ₂ SO ₄ | | |
| T. Nitrogen | HDPE | 250 ml | 1 | H ₂ SO ₄ | | |
| Diss. Cu and Zn * | HDPE | 250 ml | 1 | HNO ₃ | | |
| Hardness, Total Cu and Zn | HDPE | 500 ml | 1 | HNO ₃ | | ✓ |

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

| | |
|---------------------------|------------------------------|
| Duplicate sample ID: | <u>DA47-20180308 @ 12:40</u> |
| Filter blank sample ID: | <u>NA</u> |
| Transfer blank sample ID: | <u>NA</u> |

Visual and Olfactory Conditions:

| | |
|-------------|-----------------|
| Clarity: | <u>clear</u> |
| Color: | <u>none</u> |
| Odor: | <u>none</u> |
| Sheen: | <u>none</u> |
| Floatables: | <u>susp sed</u> |

LABORATORY DELIVERY

| | |
|-------------|-------------|
| Date: _____ | Time: _____ |
|-------------|-------------|

Quality Assurance

| | |
|------------------------------|---|
| Checked By: <u>3. Cerv</u> | Signature: <u>[Signature]</u> |
| Date Checked: <u>5-23-18</u> | Time: _____ |
| Data Entered into Database? | YES <input checked="" type="checkbox"/> NO <input type="checkbox"/> initials: _____ |
| Date Entered: _____ | Time: _____ |
| Notes: _____ | |

Project Name: Redmond Paired Watershed Study

Current Weather and Temp: Rain 45°F

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

| | |
|--------------------------|----------|
| YSI Pro Plus (15D100020) | _____ |
| YSI Pro DSS 1 | <u>X</u> |
| YSI Pro DSS 2 | _____ |

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

| | |
|--------------------------------|-------------|
| Stream Stage (ft): | <u>2.75</u> |
| Reference Point (description): | <u>SH</u> |

Water Quality Measurements

| | |
|-------------------------------|--------------|
| Temperature (°C) | <u>10.5</u> |
| Specific Conductivity (µs/cm) | <u>195.3</u> |
| Dissolved Oxygen (mg/L) | <u>11.95</u> |

2

FIELD SAMPLING SHEET - Redmond Paired Watershed Study



Field Personnel: BB
 Sample Date: 3.8.18 Sample Time: 1100 PDT
 Base Flow or Storm Event? Storm Event? Field Filtered Time: 1105 PST: X
(Must filter within 15 minutes of collection)

SITE ID: COUMO
 Project Number: 14-05806-000

Project Name: Redmond Paired Watershed Study
 Current Weather and Temp: Rain 45°F

Water Quality Sampling

Sample ID: COUMO-20180308

| Parameter | Bottle Type | Bottle Volume | # Bottles | Preservative | Duplicated? |
|---------------------------|-------------|---------------|-----------|--------------------------------|-------------|
| TSS and Turbidity | HDPE | 1L | 1 | NA | N |
| DOC * | HDPE | 250 ml | 1 | HCL | ↓ |
| Fecal Col. Bact. | HDPE | 250 ml | 1 | EDTA | |
| T. Phosphorous | HDPE | 250 ml | 1 | H ₂ SO ₄ | |
| T. Nitrogen | HDPE | 250 ml | 1 | H ₂ SO ₄ | |
| Diss. Cu and Zn * | HDPE | 250 ml | 1 | HNO ₃ | |
| Hardness, Total Cu and Zn | HDPE | 500 ml | 1 | HNO ₃ | |

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID: _____
 Filter blank sample ID: _____
 Transfer blank sample ID: _____

Visual and Olfactory Conditions:

Clarity: cloudy
 Color: light brown tint
 Odor: none
 Sheen: none
 Floatables: susp sed

LABORATORY DELIVERY

Date: _____ Time: _____

Quality Assurance

Checked By: S. Lenth Signature: [Signature]
 Date Checked: 5-23-18 Time: _____
 Data Entered into Database? YES NO initials: _____
 Date Entered: _____ Time: _____
 Notes: _____

Field Meter Calibration

Check which field meter was used and complete the meter calibration form
 YSI Pro Plus (15D100020) _____
 YSI Pro DSS 1 X _____
 YSI Pro DSS 2 _____

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)
 Stream Stage (ft): 1.37
 Reference Point (description): SG

Water Quality Measurements

Temperature (°C) 10.0
 Specific Conductivity (µs/cm) 1108.4
 Dissolved Oxygen (mg/L) 11.80

FIELD SAMPLING SHEET - Redmond Paired Watershed Study



Field Personnel: GK + VW

SITE ID: EVAMS

Sample Date: 3.8.18

Sample Time: 1130

PDT: _____

Base Flow or Storm Event? Storm

Field Filtered Time: 1130

PST: A

Project Number: 14-05806-000

(Must filter within 15 minutes of collection)

Project Name: Redmond Paired Watershed Study

Current Weather and Temp: 44°F + rain

Water Quality Sampling

Sample ID: EVAMS20180308

| Parameter | Bottle Type | Bottle Volume | # Bottles | Preservative | Duplicated? |
|---------------------------|-------------|---------------|-----------|--------------------------------|-------------|
| TSS and Turbidity | HDPE | 1L | 1 | NA | <u>NO</u> |
| DOC * | HDPE | 250 ml | 1 | HCL | ↓ |
| Fecal Col. Bact. | HDPE | 250 ml | 1 | EDTA | |
| T. Phosphorous | HDPE | 250 ml | 1 | H ₂ SO ₄ | |
| T. Nitrogen | HDPE | 250 ml | 1 | H ₂ SO ₄ | |
| Diss. Cu and Zn * | HDPE | 250 ml | 1 | HNO ₃ | |
| Hardness, Total Cu and Zn | HDPE | 500 ml | 1 | HNO ₃ | |

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID: _____
 Filter blank sample ID: _____
 Transfer blank sample ID: _____

Visual and Olfactory Conditions:

Clarity: N/A
 Color: N/A
 Odor: N/A
 Sheen: N/A
 Floatables: FOAM

LABORATORY DELIVERY

Date: _____ Time: _____

Quality Assurance

Checked By: J. Lenth Signature: [Signature]

Date Checked: 5-23-18 Time: _____

Data Entered into Database? YES NO initials: _____

Date Entered: _____ Time: _____

Notes: _____

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

YSI Pro Plus (15D100020) _____
 YSI Pro DSS 1 _____
 YSI Pro DSS 2 A

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): 3.94
 Reference Point (description): SG.

Water Quality Measurements

Temperature (°C) 6.8
 Specific Conductivity (µs/cm) 187.5
 Dissolved Oxygen (mg/L) 11.78

FIELD SAMPLING SHEET - Redmond Paired Watershed Study



Field Personnel: GK + VW

Sample Date: 3-8-18

Sample Time: 1145

PDT:

SITE ID: EVALSS

Base Flow or Storm Event? Storm Event

Field Filtered Time: 1145

PST: X

Project Number: 14-05806-000

(Must filter within 15 minutes of collection)

Project Name: Redmond Paired Watershed Study

Current Weather and Temp: Rain + 46°

Water Quality Sampling

Sample ID: EVALSS20180308

| Parameter | Bottle Type | Bottle Volume | # Bottles | Preservative | Duplicated? |
|---------------------------|-------------|---------------|-----------|--------------------------------|-------------|
| TSS and Turbidity | HDPE | 1L | 1 | NA | NO ↓ |
| DOC * | HDPE | 250 ml | 1 | HCL | |
| Fecal Col. Bact. | HDPE | 250 ml | 1 | EDTA | |
| T. Phosphorous | HDPE | 250 ml | 1 | H ₂ SO ₄ | |
| T. Nitrogen | HDPE | 250 ml | 1 | H ₂ SO ₄ | |
| Diss. Cu and Zn * | HDPE | 250 ml | 1 | HNO ₃ | |
| Hardness, Total Cu and Zn | HDPE | 500 ml | 1 | HNO ₃ | |

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID: _____
 Filter blank sample ID: _____
 Transfer blank sample ID: _____

Visual and Olfactory Conditions:

Clarity: N/A
 Color: _____
 Odor: _____
 Sheen: _____
 Floatables: _____

LABORATORY DELIVERY

Date: _____ Time: _____

Quality Assurance

Checked By: S. Lenth Signature: [Signature]
 Date Checked: 5-23-18 Time: _____
 Data Entered into Database? YES NO initials: _____
 Date Entered: _____ Time: _____
 Notes: _____

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

YSI Pro Plus (15D100020)
YSI Pro DSS 1
YSI Pro DSS 2 X

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): 2.33
 Reference Point (description): SG

Water Quality Measurements

Temperature (°C) 6.8
 Specific Conductivity (µs/cm) 174.5
 Dissolved Oxygen (mg/L) 12.03

FIELD SAMPLING SHEET - Redmond Paired Watershed Study



HERRERA

Field Personnel: BB

Sample Date: 3-8-18

Sample Time: 1250

PDT: _____

SITE ID: MONMN

Base Flow or Storm Event? Storm

Field Filtered Time: 1255

PST: X

Project Number: 14-05806-000

(Must filter within 15 minutes of collection)

Project Name: Redmond Paired Watershed Study

Current Weather and Temp: Rain 46°F

Water Quality Sampling

Sample ID: MONMN-20180308

| Parameter | Bottle Type | Bottle Volume | # Bottles | Preservative | Duplicated? |
|---------------------------|-------------|---------------|-----------|--------------------------------|-------------|
| TSS and Turbidity | HDPE | 1L | 1 | NA | N |
| DOC * | HDPE | 250 ml | 1 | HCL | L |
| Fecal Col. Bact. | HDPE | 250 ml | 1 | EDTA | |
| T. Phosphorous | HDPE | 250 ml | 1 | H ₂ SO ₄ | |
| T Nitrogen | HDPE | 250 ml | 1 | H ₂ SO ₄ | |
| Diss. Cu and Zn * | HDPE | 250 ml | 1 | HNO ₃ | |
| Hardness, Total Cu and Zn | HDPE | 500 ml | 1 | HNO ₃ | |

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID: _____
 Filter blank sample ID: _____
 Transfer blank sample ID: _____

Visual and Olfactory Conditions:

Clarity: clear
 Color: none
 Odor: none
 Sheen: none
 Floatables: susp sed

LABORATORY DELIVERY

Date: _____ Time: _____

Quality Assurance

Checked By: S. Lenth Signature: [Signature]
 Date Checked: 5-23-18 Time: _____
 Data Entered into Database? YES NO Initials: _____
 Date Entered: _____ Time: _____
 Notes: _____

Field Meter Calibration

Check which field meter was used and complete the meter calibration form
 YSI Pro Plus (15D100020) _____
 YSI Pro DSS 1 X _____
 YSI Pro DSS 2 _____

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)
 Stream Stage (ft): 9.19
 Reference Point (description): SG

Water Quality Measurements

Temperature (°C) 10.2
 Specific Conductivity (µs/cm) 135.3
 Dissolved Oxygen (mg/L) 11.89

FIELD SAMPLING SHEET - Redmond Paired Watershed Study



HERRERA

Field Personnel: BAB

Sample Date: 3-8-12

Sample Time: 13:10

PDT

SITE ID: MONMS

Base Flow or Storm Event? (circled)

Field Filtered Time: 13:15

PST

Project Number: 14-05806-000

(Must filter within 15 minutes of collection)

Project Name: Redmond Paired Watershed Study

Current Weather and Temp: Rain 46°F

Water Quality Sampling

Sample ID: MONMS-20120308

| Parameter | Bottle Type | Bottle Volume | # Bottles | Preservative | Duplicated? |
|---------------------------|-------------|---------------|-----------|--------------------------------|-------------------------------------|
| TSS and Turbidity | HDPE | 1L | 1 | NA | <input checked="" type="checkbox"/> |
| DOC * | HDPE | 250 ml | 1 | HCL | <input type="checkbox"/> |
| Fecal Col. Bact. | HDPE | 250 ml | 1 | EDTA | <input type="checkbox"/> |
| T. Phosphorous | HDPE | 250 ml | 1 | H ₂ SO ₄ | <input type="checkbox"/> |
| T. Nitrogen | HDPE | 250 ml | 1 | H ₂ SO ₄ | <input type="checkbox"/> |
| Diss. Cu and Zn * | HDPE | 250 ml | 1 | HNO ₃ | <input type="checkbox"/> |
| Hardness, Total Cu and Zn | HDPE | 500 ml | 1 | HNO ₃ | <input checked="" type="checkbox"/> |

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID: _____

Filter blank sample ID: _____

Transfer blank sample ID: _____

Visual and Olfactory Conditions:

Clarity: clear
 Color: none
 Odor: _____
 Sheen: _____
 Floatables: _____

LABORATORY DELIVERY

Date: _____

Time: _____

Quality Assurance

Checked By: S. Leuth

Signature: [Signature]

Date Checked: 3-23-12

Time: _____

Data Entered into Database? _____

YES NO initials:

Date Entered: _____

Time: _____

Notes: _____

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

YSI Pro Plus (15D100020) _____

YSI Pro DSS 1

YSI Pro DSS 2 _____

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): 6.65

Reference Point (description): vault

Water Quality Measurements

Temperature (°C) 6.8

Specific Conductivity (µs/cm) 270.1

Dissolved Oxygen (mg/L) 11.31

FIELD SAMPLING SHEET - Redmond Paired Watershed Study



HERRERA

Field Personnel: VW + GK

Sample Date: 03-08-2018

Sample Time: 1340

PDT:

SITE ID: MONM

Base Flow or Storm Event? (circled)

Field Filtered Time: 1340

PST:

Project Number: 14-05806-000

(Must filter within 15 minutes of collection)

Project Name: Redmond Paired Watershed Study

Current Weather and Temp: 46°F + Rain

Water Quality Sampling

Sample ID: MONM 20180308

| Parameter | Bottle Type | Bottle Volume | # Bottles | Preservative | Duplicated? |
|---------------------------|-------------|---------------|-----------|--------------------------------|-------------|
| TSS and Turbidity | HDPE | 1L | 1 | NA | <u>NO</u> |
| DOC * | HDPE | 250 ml | 1 | HCL | ↓ |
| Fecal Col. Bact. | HDPE | 250 ml | 1 | EDTA | |
| T. Phosphorous | HDPE | 250 ml | 1 | H ₂ SO ₄ | |
| T Nitrogen | HDPE | 250 ml | 1 | H ₂ SO ₄ | |
| Diss. Cu and Zn * | HDPE | 250 ml | 1 | HNO ₃ | |
| Hardness, Total Cu and Zn | HDPE | 500 ml | 1 | HNO ₃ | |

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID: _____
 Filter blank sample ID: _____
 Transfer blank sample ID: _____

Visual and Olfactory Conditions:

Clarity: _____
 Color: Brown N/A
 Odor: N/A
 Sheen: N/A
 Floatables: N/A

LABORATORY DELIVERY

Date: _____ Time: _____

Quality Assurance

Checked By: S. Lenth Signature: _____
 Date Checked: 3-23-18 Time: _____
 Data Entered into Database? YES NO initials: _____
 Date Entered: _____ Time: _____
 Notes: _____

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

YSI Pro Plus (15D100020) _____
 YSI Pro DSS 1 _____
 YSI Pro DSS 2 (circled) _____

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): N/A
 Reference Point (description): N/A

Water Quality Measurements

Temperature (°C) 6.9
 Specific Conductivity (µs/cm) 194.9
 Dissolved Oxygen (mg/L) 12.05

FIELD SAMPLING SHEET - Redmond Paired Watershed Study



Field Personnel: VN + GK

Sample Date: 03-08-2018

Base Flow or Storm Event? Storm

Sample Time: 1245

Field Filtered Time: 1245

(Must filter within 15 minutes of collection)

SITE ID: ~~SE1MN~~ SE1MN

Project Number: 14-05806-000

Project Name: Redmond Paired Watershed Study

Current Weather and Temp: Rain +44°F

Water Quality Sampling

Sample ID: SE1MN 20180308

| Parameter | Bottle Type | Bottle Volume | # Bottles | Preservative | Duplicated? |
|---------------------------|-------------|---------------|-----------|--------------------------------|-------------|
| TSS and Turbidity | HDPE | 1L | 1 | NA | <u>NO</u> |
| DOC * | HDPE | 250 ml | 1 | HCL | |
| Fecal Col. Bact. | HDPE | 250 ml | 1 | EDTA | |
| T. Phosphorous | HDPE | 250 ml | 1 | H ₂ SO ₄ | |
| T. Nitrogen | HDPE | 250 ml | 1 | H ₂ SO ₄ | |
| Diss. Cu and Zn * | HDPE | 250 ml | 1 | HNO ₃ | |
| Hardness, Total Cu and Zn | HDPE | 500 ml | 1 | HNO ₃ | |

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID: _____
 Filter blank sample ID: _____
 Transfer blank sample ID: _____

Visual and Olfactory Conditions:

Clarity: N/A
 Color: I
 Odor: _____
 Sheen: _____
 Floatables: _____

LABORATORY DELIVERY

Date: _____ Time: _____

Quality Assurance

Checked By: J. Leath Signature: [Signature]

Date Checked: 5-23-18 Time: _____

Data Entered into Database? YES NO initials: _____

Date Entered: _____ Time: _____

Notes: _____

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

YSI Pro Plus (15D100020)

YSI Pro DSS 1

YSI Pro DSS ~~X~~

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): 0.61

Reference Point (description): Top of bolt down to Water Surface

Water Quality Measurements

Temperature (°C) 5.9

Specific Conductivity (µs/cm) 55.2

Dissolved Oxygen (mg/L) 12.19

FIELD SAMPLING SHEET - Redmond Paired Watershed Study



HERRERA

Field Personnel: BOB

Sample Date: 3-8-17

Base Flow or Storm Event? Storm

Sample Time: 1340

Field Filtered Time: 1345
(Must filter within 15 minutes of collection)

PDT:

PST: X

SITE ID: SEIMS

Project Number: 14-05806-000

Project Name: Redmond Paired Watershed Study

Current Weather and Temp: Rain 46°F

Water Quality Sampling

Sample ID: SEIMS-20180308

| Parameter | Bottle Type | Bottle Volume | # Bottles | Preservative | Duplicated? |
|---------------------------|-------------|---------------|-----------|--------------------------------|-------------|
| TSS and Turbidity | HDPE | 1L | 1 | NA | N |
| DOC * | HDPE | 250 ml | 1 | HCL | |
| Fecal Col. Bact. | HDPE | 250 ml | 1 | EDTA | |
| T. Phosphorous | HDPE | 250 ml | 1 | H ₂ SO ₄ | |
| T Nitrogen | HDPE | 250 ml | 1 | H ₂ SO ₄ | |
| Diss. Cu and Zn * | HDPE | 250 ml | 1 | HNO ₃ | |
| Hardness, Total Cu and Zn | HDPE | 500 ml | 1 | HNO ₃ | |

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID: _____
 Filter blank sample ID: _____
 Transfer blank sample ID: _____

Visual and Olfactory Conditions:

Clarity: clear
 Color: light brown
 Odor: none
 Sheen: none
 Floatables: none

LABORATORY DELIVERY

Date: _____ Time: _____

Quality Assurance

Checked By: 3 Lenth Signature: [Signature]
 Date Checked: 5-23-18 Time: _____
 Data Entered into Database? YES NO initials:
 Date Entered: _____ Time: _____
 Notes: _____

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

YSI Pro Plus (15D100020) _____
 YSI Pro DSS 1 X _____
 YSI Pro DSS 2 _____

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): 0.83
 Reference Point (description): SG

Water Quality Measurements

Temperature (°C) 10.0
 Specific Conductivity (µs/cm) 87.4
 Dissolved Oxygen (mg/L) 11.70

FIELD SAMPLING SHEET - Redmond Paired Watershed Study



HERRERA

Field Personnel: GK + VW

Sample Date: 3-8-18

Sample Time: 11:10

PDT: _____

SITE ID: TOSM1

Base Flow or Storm Event? Storm Event?

Field Filtered Time: 11:10

PST:

Project Number: 14-05806-000

(Must filter within 15 minutes of collection)

Project Name: Redmond Paired Watershed Study

Water Quality Sampling

Sample ID: TOSM120180308

| Parameter | Bottle Type | Bottle Volume | # Bottles | Preservative | Duplicated? |
|---------------------------|-------------|---------------|-----------|--------------------------------|-------------|
| TSS and Turbidity | HDPE | 1L | 1 | NA | <u>NO</u> |
| DOC * | HDPE | 250 ml | 1 | HCL | ↓ |
| Fecal Col. Bact. | HDPE | 250 ml | 1 | EDTA | |
| T. Phosphorous | HDPE | 250 ml | 1 | H ₂ SO ₄ | |
| T Nitrogen | HDPE | 250 ml | 1 | H ₂ SO ₄ | |
| Diss. Cu and Zn * | HDPE | 250 ml | 1 | HNO ₃ | |
| Hardness, Total Cu and Zn | HDPE | 500 ml | 1 | HNO ₃ | |

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID: _____
 Filter blank sample ID: _____
 Transfer blank sample ID: _____

Visual and Olfactory Conditions:

Clarity: N/A
 Color: Light Brown
 Odor: N/A
 Sheen: N/A
 Floatables: N/A

LABORATORY DELIVERY

Date: _____ Time: _____

Quality Assurance

Checked By: S. Leuth Signature: [Signature]
 Date Checked: 3-23-18 Time: _____
 Data Entered into Database? YES NO initials:
 Date Entered: _____ Time: _____
 Notes: _____

Current Weather and Temp: 44°F + rain

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

YSI Pro Plus (15D100020) _____
 YSI Pro DSS 1 _____
 YSI Pro DSS 2 X

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): 0.89
 Reference Point (description): Staff Gauge

Water Quality Measurements

Temperature (°C) 7.7
 Specific Conductivity (µs/cm) 124.2
 Dissolved Oxygen (mg/L) 11.60

FIELD SAMPLING SHEET - Redmond Paired Watershed Study



HERRERA

Field Personnel: BB

Sample Date: 3-8-18

Sample Time: 1140

PDT

SITE ID:

TOSMO

Base Flow or Storm Event? Storm

Field Filtered Time: 1145

PST:

Project Number: 14-05806-000

(Must filter within 15 minutes of collection)

Project Name: Redmond Paired Watershed Study

Current Weather and Temp: RAIN 45°F

Water Quality Sampling

Sample ID: TOSMO-2080308

| Parameter | Bottle Type | Bottle Volume | # Bottles | Preservative | Duplicated? |
|---------------------------|-------------|---------------|-----------|--------------------------------|-------------|
| TSS and Turbidity | HDPE | 1L | 1 | NA | N |
| DOC * | HDPE | 250 ml | 1 | HCL | ↓ |
| Fecal Col. Bact. | HDPE | 250 ml | 1 | EDTA | |
| T. Phosphorous | HDPE | 250 ml | 1 | H ₂ SO ₄ | |
| T. Nitrogen | HDPE | 250 ml | 1 | H ₂ SO ₄ | |
| Diss. Cu and Zn * | HDPE | 250 ml | 1 | HNO ₃ | |
| Hardness, Total Cu and Zn | HDPE | 500 ml | 1 | HNO ₃ | |

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID:

Filter blank sample ID:

Transfer blank sample ID:

Visual and Olfactory Conditions:

Clarity: clear
 Color: light brown tint
 Odor: none
 Sheen: none
 Floatables: susp sed

LABORATORY DELIVERY

Date:

Time:

Quality Assurance

Checked By: J. Leach

Signature:

Date Checked: 3-23-18

Time:

Data Entered into Database?

YES NO initials:

Date Entered:

Time:

Notes:

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

YSI Pro Plus (15D100020)

YSI Pro DSS 1

YSI Pro DSS 2

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): 0.71

Reference Point (description): SG

Water Quality Measurements

Temperature (°C) 7.1

Specific Conductivity (µs/cm) 1100.7

Dissolved Oxygen (mg/L) 11.92

FIELD SAMPLING SHEET - Redmond Paired Watershed Study



Field Personnel: BB
 Sample Date: 3-8-17 Sample Time: 1225 PDT
 Base Flow or Storm Event? Storm Field Filtered Time: 1230 PST: X
(Must filter within 15 minutes of collection)

SITE ID: TYLMI
 Project Number: 14-05806-000

Project Name: Redmond Paired Watershed Study
 Current Weather and Temp: Rain 46°F

Water Quality Sampling

Sample ID: TYLMI-20180308

| Parameter | Bottle Type | Bottle Volume | # Bottles | Preservative | Duplicated? |
|---------------------------|-------------|---------------|-----------|--------------------------------|-------------|
| TSS and Turbidity | HDPE | 1L | 1 | NA | N |
| DOC * | HDPE | 250 ml | 1 | HCL | ↓ |
| Fecal Col. Bact. | HDPE | 250 ml | 1 | EDTA | |
| T. Phosphorous | HDPE | 250 ml | 1 | H ₂ SO ₄ | |
| T. Nitrogen | HDPE | 250 ml | 1 | H ₂ SO ₄ | |
| Diss. Cu and Zn * | HDPE | 250 ml | 1 | HNO ₃ | |
| Hardness, Total Cu and Zn | HDPE | 500 ml | 1 | HNO ₃ | ↓ |

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID: _____
 Filter blank sample ID: _____
 Transfer blank sample ID: _____

Visual and Olfactory Conditions:

Clarity: clear
 Color: none
 Odor: none
 Sheen: none
 Floatables: susp sed

LABORATORY DELIVERY

Date: _____ Time: _____

Quality Assurance

Checked By: [Signature] Signature: _____
 Date Checked: 3-23-18 Time: _____
 Data Entered into Database? YES NO initials: _____
 Date Entered: _____ Time: _____
 Notes: _____

Field Meter Calibration

Check which field meter was used and complete the meter calibration form
 YSI Pro Plus (15D100020) _____
 YSI Pro DSS 1 X _____
 YSI Pro DSS 2 _____

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)
 Stream Stage (ft): 4.51
 Reference Point (description): top of culvert ↓

Water Quality Measurements

Temperature (°C) 6.8
 Specific Conductivity (µs/cm) 193.9
 Dissolved Oxygen (mg/L) 11.75

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: BB
 Sample Date: 3-8-18 Sample Time: 1205 PDT
 Base Flow or Storm Event? (circled) Field Filtered Time: 1210 PST X
(Must filter within 15 minutes of collection)

SITE ID: TYLMO
 Project Number: 14-05806-000



Project Name: Redmond Paired Watershed Study
 Current Weather and Temp: Rain 40°F

Water Quality Sampling

Sample ID: TYLMO-20180308

| Parameter | Bottle Type | Bottle Volume | # Bottles | Preservative | Duplicated? |
|---------------------------|-------------|---------------|-----------|--------------------------------|-------------------------------------|
| TSS and Turbidity | HDPE | 1L | 1 | NA | <input checked="" type="checkbox"/> |
| DOC * | HDPE | 250 ml | 1 | HCL | <input checked="" type="checkbox"/> |
| Fecal Col. Bact. | HDPE | 250 ml | 1 | EDTA | <input checked="" type="checkbox"/> |
| T. Phosphorous | HDPE | 250 ml | 1 | H ₂ SO ₄ | <input checked="" type="checkbox"/> |
| T. Nitrogen | HDPE | 250 ml | 1 | H ₂ SO ₄ | <input checked="" type="checkbox"/> |
| Diss. Cu and Zn * | HDPE | 250 ml | 1 | HNO ₃ | <input checked="" type="checkbox"/> |
| Hardness, Total Cu and Zn | HDPE | 500 ml | 1 | HNO ₃ | <input checked="" type="checkbox"/> |

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID: _____
 Filter blank sample ID: _____
 Transfer blank sample ID: _____

Visual and Olfactory Conditions:

Clarity: clear
 Color: light brown
 Odor: none
 Sheen: none
 Floatables: susp sid

LABORATORY DELIVERY

Date: _____ Time: _____

Quality Assurance

Checked By: [Signature] Signature: [Signature]
 Date Checked: 3-23-18 Time: _____
 Data Entered into Database? YES NO initials: _____
 Date Entered: _____ Time: _____
 Notes: _____

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

YSI Pro Plus (15D100020) _____
 YSI Pro DSS 1 X _____
 YSI Pro DSS 2 _____

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): 2.71
 Reference Point (description): top of culvert

Water Quality Measurements

Temperature (°C) 6.7
 Specific Conductivity (µs/cm) 79.2
 Dissolved Oxygen (mg/L) 11.89



HERRERA

Data Quality Assurance Worksheet

Project Name/No./Client: Redmond Paired Watershed Study / 14-05806-000 / City of Redmond

Laboratory/Parameters: OnSite Environmental : TSS, turbidity, hardness, DOC, TP, Dissolved & Total Cu, Zn / AmTest: Total nitrogen, fecal coliform bacteria

Sample Date/Sample ID: 3/08/2018 / All sites, 1 FD (QA47) at COUMI

By G. Catarra

Date 3/28/18 Page 1 of 2

Checked: initials JL

date 5/23/2018

| Parameter | Completeness/ Methodology | Pre-preservation Holding Times (minutes) | | Total Holding Times (days) | | Method Blanks Reporting Limit | Matrix Spikes/ Surrogate Recovery (%) | | Lab Control Samples Recovery (%) | | Lab Duplicates RPD (%) | | Field Duplicates RPD (%) | | Instrument Calibration/ Performance | ACTION |
|-------------------------------------|------------------------------|--|------|-------------------------------|------|--|---|-------------------|--|-------------------|---------------------------|-------------------|-----------------------------|-------------------|---|--------|
| | | Reported | Goal | Reported | Goal | | Reported | Goal ¹ | Reported | Goal ¹ | Reported | Goal ¹ | Reported | Goal ¹ | | |
| TSS | OK / SM 2540D | NA | NA | 5 | ≤7 | ≤1.0 mg/L 1.0 mg/L | NA | NA | 113 | ±20 | 3 | ≤25 | 5.1 | ≤25 | OK | NONE |
| Turbidity | OK / EPA 180.1 | NA | NA | <1 | ≤2 | ≤0.1 NTU 0.1 NTU | NA | NA | NA | ±10 | 0 | ≤25 | 0 | ≤25 | OK | NONE |
| Hardness | OK / SM 2340B | NA | NA | 5 | ≤180 | ≤1.0 mg/L 1.0 mg/L | 99,100 | ±25 | 100 | ±15 | 3 | ≤20 | 4.3 | ≤20 | OK | NONE |
| DOC | OK / SM 5310B | <15 | ≤15 | 7 | ≤28 | ≤1.0 mg/L 1.0 mg/L | 100 | ±25 | 100 | ±15 | 1 | ≤20 | 2.6 | ≤20 | OK | NONE |
| Total Phosphorus | OK / EPA 365.1 | NA | NA | 12 | ≤28 | ≤0.01 mg/L 0.01 mg/L | 101 | ±25 | 99 | ±20 | 9 | ≤20 | 9.7 | ≤20 | OK | NONE |
| Total Nitrogen (TKN + N+N) | OK/ SM 4500 N-B | NA | NA | 6,10 | ≤28 | ≤0.1 mg/L 0.1 mg/L | 86-97 | ±25 | 94-111 | ±20 | Diff=0.0 95, 0-11 | ≤20 | 7.0,3.8 | ≤20 | OK | NONE |

¹ If the sample or duplicate value is less than five times the reporting limit, the difference is calculated rather than the relative percent difference (RPD). The QA goal is a difference <2 times the detection limit instead of the number indicated in the goal column.

NA – not applicable or not available; NC – not calculable due to one or more values below the detection limit; NS – field duplicate not sampled.



Data Quality Assurance Worksheet

By G. Catarra

Project Name/No./Client: Redmond Paired Watershed Study / 14-05806-000 / City of Redmond

Date 3/28/18 Page 2 of 2

Laboratory/Parameters: OnSite Environmental : TSS, turbidity, hardness, DOC, TP, Dissolved & Total Cu, Zn / AmTest: total nitrogen, fecal coliform bacteria

Checked: initials
JL

Sample Date/Sample ID: 3/08/2018 / All sites, 1 FD (QA47) at COUMI

date 5/23/2018

| Parameter | Completeness/ Methodology | Pre-preservation Holding Times (minutes) | | Total Holding Times (days) | | Method Blanks Reporting Limit | Matrix Spikes/ Surrogate Recovery (%) | | Lab Control Samples Recovery (%) | | Lab Duplicates RPD (%) | | Field Duplicates RPD (%) | | Instrument Calibration/ Performance | ACTION |
|------------------|------------------------------|--|------|-------------------------------|------|--|---|-------------------|--|------|---------------------------|-------------------|-----------------------------|-------------------|---|--------|
| | | Reported | Goal | Reported | Goal | | Reported | Goal ¹ | Reported | Goal | Reported | Goal ¹ | Reported | Goal ¹ | | |
| Total Copper | OK/ EPA 200.8 | NA | NA | 8 | ≤180 | ≤1.0 µg/L 1.0 µg/L | 97,99 | ±25 | NR | ±15 | 2 | ≤20 | DIFF = 0.5 | ≤20 | OK | NONE |
| Total Zinc | OK/ EPA 200.8 | NA | NA | 8 | ≤180 | ≤5.0 µg/L 5.0 µg/L | 107,111 | ±25 | NR | ±15 | 9 | ≤20 | DIFF = 1.0 | ≤20 | OK | NONE |
| Dissolved Copper | OK/ EPA 200.8 | <15 | ≤15 | 1 | ≤180 | ≤1.0 µg/L 1.0 µg/L | 97,98 | ±25 | NR | ±15 | 4 | ≤20 | 0 | ≤20 | OK | NONE |
| Dissolved Zinc | OK/ EPA 200.8 | <15 | ≤15 | 1 | ≤180 | ≤5.0 µg/L 5.0 µg/L | 106,104 | ±25 | NR | ±15 | NC | ≤20 | NC | ≤20 | OK | NONE |
| Fecal Coliform | OK/ SM 9222D | NA | NA | 1 | ≤1 | ≤1.0 cfu/ 100mL 10 cfu/ 100mL | NA | NA | NA | NA | 17,5.4 | ≤35 | 5.4 | ≤50 | OK | NONE |

¹ If the sample or duplicate value is less than five times the reporting limit, the difference is calculated rather than the relative percent difference (RPD). The QA goal is a difference <2 times the detection limit instead of the number indicated in the goal column.

NA – not applicable or not available; NC – not calculable due to one or more values below the detection limit; NS – field duplicate not sampled.



14648 NE 95th Street, Redmond, WA 98052 • (425) 883-3881

April 11, 2018

John Lenth
Herrera Environmental Consultants, Inc.
2200 6th Avenue, Suite 1100
Seattle, WA 98121

Re: Analytical Data for Project 14-05806-000
Laboratory Reference No. 1803-183

Dear John:

Enclosed are the analytical results and associated quality control data for samples submitted on March 20, 2018.

The standard policy of OnSite Environmental, Inc. is to store your samples for 30 days from the date of receipt. If you require longer storage, please contact the laboratory.

We appreciate the opportunity to be of service to you on this project. If you have any questions concerning the data, or need additional information, please feel free to call me.

Sincerely,

A handwritten signature in black ink, appearing to read "Blair Goodrow", enclosed within a large, loopy circular flourish.

Blair Goodrow
Project Manager

Enclosures



OnSite Environmental, Inc. 14648 NE 95th Street, Redmond, WA 98052 (425) 883-3881

This report pertains to the samples analyzed in accordance with the chain of custody, and is intended only for the use of the individual or company to whom it is addressed.

Date of Report: April 11, 2018
Samples Submitted: March 20, 2018
Laboratory Reference: 1803-183
Project: 14-05806-000

Case Narrative

Samples were collected on March 20, 2018 and received by the laboratory on March 20, 2018. They were maintained at the laboratory at a temperature of 2°C to 6°C.

Please note that any and all soil sample results are reported on a dry-weight basis, unless otherwise noted below.

General QA/QC issues associated with the analytical data enclosed in this laboratory report will be indicated with a reference to a comment or explanation on the Data Qualifier page. More complex and involved QA/QC issues will be discussed in detail below.



Date of Report: April 11, 2018
 Samples Submitted: March 20, 2018
 Laboratory Reference: 1803-183
 Project: 14-05806-000

**TOTAL SUSPENDED SOLIDS
 SM 2540D**

Matrix: Water
 Units: mg/L

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|------------------------|----------------------|------------|---------------|----------------------|----------------------|--------------|
| Client ID: | COLM-20180320 | | | | | |
| Laboratory ID: | 03-183-01 | | | | | |
| Total Suspended Solids | ND | 1.0 | SM 2540D | 3-21-18 | 3-22-18 | |

| | | | | | | |
|------------------------|----------------------|-----|----------|---------|---------|--|
| Client ID: | QA48-20180320 | | | | | |
| Laboratory ID: | 03-183-02 | | | | | |
| Total Suspended Solids | ND | 1.0 | SM 2540D | 3-21-18 | 3-22-18 | |



Date of Report: April 11, 2018
 Samples Submitted: March 20, 2018
 Laboratory Reference: 1803-183
 Project: 14-05806-000

**TOTAL SUSPENDED SOLIDS
 SM 2540D
 QUALITY CONTROL**

Matrix: Water
 Units: mg/L

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|------------------------|-----------|-----|----------|---------------|---------------|-------|
| METHOD BLANK | | | | | | |
| Laboratory ID: | MB0321W1 | | | | | |
| Total Suspended Solids | ND | 1.0 | SM 2540D | 3-21-18 | 3-22-18 | |

| Analyte | Result | Spike Level | Source Result | Percent Recovery | Recovery Limits | RPD | RPD Limit | Flags |
|------------------------|-----------|-------------|---------------|------------------|-----------------|-----|-----------|-------|
| DUPLICATE | | | | | | | | |
| Laboratory ID: | 03-163-02 | | | | | | | |
| | ORIG | DUP | | | | | | |
| Total Suspended Solids | ND | ND | NA | NA | NA | NA | 17 | |

| | | | | | | | | |
|------------------------|-------------|-----|----|----|--------|----|----|--|
| SPIKE BLANK | | | | | | | | |
| Laboratory ID: | SB0321W1 | | | | | | | |
| | SB | SB | | SB | | | | |
| Total Suspended Solids | 90.0 | 100 | NA | 90 | 76-114 | NA | NA | |



Date of Report: April 11, 2018
 Samples Submitted: March 20, 2018
 Laboratory Reference: 1803-183
 Project: 14-05806-000

TURBIDITY
EPA 180.1

Matrix: Water
 Units: NTU

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|-------------------|----------------------|------|-----------|---------------|---------------|-------|
| Client ID: | COLM-20180320 | | | | | |
| Laboratory ID: | 03-183-01 | | | | | |
| Turbidity | 1.0 | 0.10 | EPA 180.1 | 3-21-18 | 3-21-18 | |

| | | | | | | |
|-------------------|----------------------|------|-----------|---------|---------|--|
| Client ID: | QA48-20180320 | | | | | |
| Laboratory ID: | 03-183-02 | | | | | |
| Turbidity | ND | 0.10 | EPA 180.1 | 3-21-18 | 3-21-18 | |



Date of Report: April 11, 2018
 Samples Submitted: March 20, 2018
 Laboratory Reference: 1803-183
 Project: 14-05806-000

**TURBIDITY
 EPA 180.1
 QUALITY CONTROL**

Matrix: Water
 Units: NTU

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|---------------------|-----------|------|-----------|---------------|---------------|-------|
| METHOD BLANK | | | | | | |
| Laboratory ID: | MB0321W1 | | | | | |
| Turbidity | ND | 0.10 | EPA 180.1 | 3-21-18 | 3-21-18 | |

| Analyte | Result | Spike Level | Source Result | Percent Recovery | Recovery Limits | RPD | RPD Limit | Flags |
|------------------|-------------|--------------|---------------|------------------|-----------------|-----|-----------|-------|
| DUPLICATE | | | | | | | | |
| Laboratory ID: | 03-183-01 | | | | | | | |
| | ORIG | DUP | | | | | | |
| Turbidity | 1.01 | 0.980 | NA | NA | NA | NA | 3 | 15 |



Date of Report: April 11, 2018
 Samples Submitted: March 20, 2018
 Laboratory Reference: 1803-183
 Project: 14-05806-000

HARDNESS
EPA 200.7/SM 2340B

Matrix: Water
 Units: mg eqt. CaCO₃/L (ppm)

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|-------------------|----------------------|-----|----------------|---------------|---------------|-------|
| Client ID: | COLM-20180320 | | | | | |
| Laboratory ID: | 03-183-01 | | | | | |
| Hardness | 9.1 | 1.0 | 200.7/SM 2340B | 3-22-18 | 3-22&26-18 | |

| | | | | | | |
|-------------------|----------------------|-----|----------------|---------|------------|--|
| Client ID: | QA48-20180320 | | | | | |
| Laboratory ID: | 03-183-02 | | | | | |
| Hardness | ND | 1.0 | 200.7/SM 2340B | 3-22-18 | 3-22&26-18 | |



Date of Report: April 11, 2018
 Samples Submitted: March 20, 2018
 Laboratory Reference: 1803-183
 Project: 14-05806-000

HARDNESS
EPA 200.7/SM 2340B
QUALITY CONTROL

Matrix: Water
 Units: mg eqt. CaCO₃/L (ppm)

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|---------------------|-----------|-----|----------------|---------------|---------------|-------|
| METHOD BLANK | | | | | | |
| Laboratory ID: | MB0322WH1 | | | | | |
| Hardness | ND | 1.0 | 200.7/SM 2340B | 3-22-18 | 3-22&26-18 | |

| Analyte | Result | Spike Level | Source Result | Percent Recovery | Recovery Limits | RPD | RPD Limit | Flags |
|------------------|-------------|-------------|---------------|------------------|-----------------|-----|-----------|-------|
| DUPLICATE | | | | | | | | |
| Laboratory ID: | 03-148-01 | | | | | | | |
| | ORIG | DUP | | | | | | |
| Hardness | 28.9 | 30.7 | NA | NA | NA | NA | 6 | 20 |

| Analyte | Result | Spike Level | Source Result | Percent Recovery | Recovery Limits | RPD | RPD Limit | Flags | | |
|----------------------|------------|-------------|---------------|------------------|-----------------|-----|-----------|--------|---|----|
| MATRIX SPIKES | | | | | | | | | | |
| Laboratory ID: | 03-148-01 | | | | | | | | | |
| | MS | MSD | MS | MSD | MS | MSD | | | | |
| Hardness | 154 | 159 | 132 | 132 | 28.9 | 95 | 99 | 75-125 | 3 | 20 |

| Analyte | Result | Spike Level | Source Result | Percent Recovery | Recovery Limits | RPD | RPD Limit | Flags |
|--------------------|------------|-------------|---------------|------------------|-----------------|-----|-----------|-------|
| SPIKE BLANK | | | | | | | | |
| Laboratory ID: | SB0322WH1 | | | | | | | |
| | SB | SB | SB | SB | SB | SB | | |
| Hardness | 133 | 132 | NA | 101 | 80-120 | NA | NA | |



Date of Report: April 11, 2018
 Samples Submitted: March 20, 2018
 Laboratory Reference: 1803-183
 Project: 14-05806-000

**DISSOLVED ORGANIC CARBON
 SM 5310B**

Matrix: Water
 Units: mg/L

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|--------------------------|----------------------|-----|----------|---------------|---------------|-------|
| Client ID: | COLM-20180320 | | | | | |
| Laboratory ID: | 03-183-01 | | | | | |
| Dissolved Organic Carbon | 9.2 | 1.0 | SM 5310B | 3-26-18 | 3-26-18 | |
| Client ID: | QA48-20180320 | | | | | |
| Laboratory ID: | 03-183-02 | | | | | |
| Dissolved Organic Carbon | ND | 1.0 | SM 5310B | 3-26-18 | 3-26-18 | |
| Client ID: | QA49-20180320 | | | | | |
| Laboratory ID: | 03-183-03 | | | | | |
| Dissolved Organic Carbon | ND | 1.0 | SM 5310B | 3-26-18 | 3-26-18 | |



Date of Report: April 11, 2018
 Samples Submitted: March 20, 2018
 Laboratory Reference: 1803-183
 Project: 14-05806-000

**TOTAL ORGANIC CARBON
 SM 5310B
 QUALITY CONTROL**

Matrix: Water
 Units: mg/L

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|--------------------------|-----------|-----|----------|---------------|---------------|-------|
| METHOD BLANK | | | | | | |
| Laboratory ID: | MB0326D1 | | | | | |
| Dissolved Organic Carbon | ND | 1.0 | SM 5310B | 3-26-18 | 3-26-18 | |

| Analyte | Result | Spike Level | Source Result | Percent Recovery | Recovery Limits | RPD | RPD Limit | Flags |
|--------------------------|-------------|-------------|---------------|------------------|-----------------|-----|-----------|-------|
| DUPLICATE | | | | | | | | |
| Laboratory ID: | 03-183-01 | | | | | | | |
| | ORIG | DUP | | | | | | |
| Dissolved Organic Carbon | 9.21 | 9.47 | NA | NA | NA | 3 | 15 | |

MATRIX SPIKE

| | | | | | | | | |
|--------------------------|-------------|------|------|-----|--------|----|----|--|
| Laboratory ID: | 03-183-01 | | | | | | | |
| | MS | MS | | MS | | | | |
| Dissolved Organic Carbon | 19.6 | 10.0 | 9.21 | 104 | 75-125 | NA | NA | |

SPIKE BLANK

| | | | | | | | | |
|--------------------------|-------------|------|----|-----|--------|----|----|--|
| Laboratory ID: | SB0326D1 | | | | | | | |
| | SB | SB | | SB | | | | |
| Dissolved Organic Carbon | 10.7 | 10.0 | NA | 107 | 80-120 | NA | NA | |



Date of Report: April 11, 2018
 Samples Submitted: March 20, 2018
 Laboratory Reference: 1803-183
 Project: 14-05806-000

TOTAL PHOSPHORUS
EPA 365.1

Matrix: Water
 Units: mg/L

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|-------------------|----------------------|-------|-----------|---------------|---------------|-------|
| Client ID: | COLM-20180320 | | | | | |
| Laboratory ID: | 03-183-01 | | | | | |
| Total Phosphorus | 0.014 | 0.010 | EPA 365.1 | 3-21-18 | 3-21-18 | |

| | | | | | | |
|-------------------|----------------------|-------|-----------|---------|---------|--|
| Client ID: | QA48-20180320 | | | | | |
| Laboratory ID: | 03-183-02 | | | | | |
| Total Phosphorus | ND | 0.010 | EPA 365.1 | 3-21-18 | 3-21-18 | |



Date of Report: April 11, 2018
 Samples Submitted: March 20, 2018
 Laboratory Reference: 1803-183
 Project: 14-05806-000

**TOTAL PHOSPHORUS
 EPA 365.1
 QUALITY CONTROL**

Matrix: Water
 Units: mg/L

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|---------------------|-----------|-------|-----------|---------------|---------------|-------|
| METHOD BLANK | | | | | | |
| Laboratory ID: | MB0321W1 | | | | | |
| Total Phosphorus | ND | 0.010 | EPA 365.1 | 3-21-18 | 3-21-18 | |

| Analyte | Result | Spike Level | Source Result | Percent Recovery | Recovery Limits | RPD | RPD Limit | Flags |
|------------------|-----------|-------------|---------------|------------------|-----------------|-----|-----------|-------|
| DUPLICATE | | | | | | | | |
| Laboratory ID: | 03-183-02 | | | | | | | |
| | ORIG | DUP | | | | | | |
| Total Phosphorus | ND | ND | NA | NA | NA | NA | 11 | |

| | | | | | | | | |
|---------------------|--------------|-------|----|-----|--------|----|----|--|
| MATRIX SPIKE | | | | | | | | |
| Laboratory ID: | 03-183-02 | | | | | | | |
| | MS | MS | | MS | | | | |
| Total Phosphorus | 0.252 | 0.250 | ND | 101 | 82-124 | NA | NA | |

| | | | | | | | | |
|--------------------|--------------|-------|----|----|--------|----|----|--|
| SPIKE BLANK | | | | | | | | |
| Laboratory ID: | SB0321W1 | | | | | | | |
| | SB | SB | | SB | | | | |
| Total Phosphorus | 0.247 | 0.250 | NA | 99 | 87-114 | NA | NA | |



Date of Report: April 11, 2018
 Samples Submitted: March 20, 2018
 Laboratory Reference: 1803-183
 Project: 14-05806-000

TOTAL METALS
EPA 200.8

Matrix: Water
 Units: ug/L (ppb)

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|-------------------|----------------------|-----|-----------|---------------|---------------|-------|
| Client ID: | COLM-20180320 | | | | | |
| Laboratory ID: | 03-183-01 | | | | | |
| Copper | ND | 1.0 | EPA 200.8 | 3-23-18 | 3-23-18 | |
| Zinc | ND | 5.0 | EPA 200.8 | 3-23-18 | 3-23-18 | |

| | | | | | | |
|-------------------|----------------------|-----|-----------|---------|---------|--|
| Client ID: | QA48-20180320 | | | | | |
| Laboratory ID: | 03-183-02 | | | | | |
| Copper | 5.8 | 1.0 | EPA 200.8 | 3-23-18 | 3-23-18 | |
| Zinc | ND | 5.0 | EPA 200.8 | 3-23-18 | 3-23-18 | |



Date of Report: April 11, 2018
 Samples Submitted: March 20, 2018
 Laboratory Reference: 1803-183
 Project: 14-05806-000

**TOTAL METALS
 EPA 200.8
 QUALITY CONTROL**

Matrix: Water
 Units: ug/L (ppb)

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|---------------------|-----------|-----|-----------|---------------|---------------|-------|
| METHOD BLANK | | | | | | |
| Laboratory ID: | MB0323WH1 | | | | | |
| Copper | ND | 1.0 | EPA 200.8 | 3-23-18 | 3-23-18 | |
| Zinc | ND | 5.0 | EPA 200.8 | 3-23-18 | 3-23-18 | |

| Analyte | Result | Spike Level | Source Result | Percent Recovery | Recovery Limits | RPD | RPD Limit | Flags |
|------------------|-----------|-------------|---------------|------------------|-----------------|-----|-----------|-------|
| DUPLICATE | | | | | | | | |
| Laboratory ID: | 03-183-01 | | | | | | | |
| | ORIG | DUP | | | | | | |
| Copper | ND | ND | NA | NA | NA | NA | 20 | |
| Zinc | ND | ND | NA | NA | NA | NA | 20 | |

MATRIX SPIKES

| | | | | | | | | | | |
|----------------|-----------|-----|-----|-----|----|-----|-----|--------|---|----|
| Laboratory ID: | 03-183-01 | | | | | | | | | |
| | MS | MSD | MS | MSD | | MS | MSD | | | |
| Copper | 103 | 106 | 100 | 100 | ND | 103 | 106 | 75-125 | 2 | 20 |
| Zinc | 108 | 104 | 100 | 100 | ND | 108 | 104 | 75-125 | 4 | 20 |



Date of Report: April 11, 2018
 Samples Submitted: March 20, 2018
 Laboratory Reference: 1803-183
 Project: 14-05806-000

DISSOLVED METALS
EPA 200.8

Matrix: Water
 Units: ug/L (ppb)

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|-------------------|----------------------|-----|-----------|---------------|---------------|-------|
| Client ID: | COLM-20180320 | | | | | |
| Laboratory ID: | 03-183-01 | | | | | |
| Copper | ND | 1.0 | EPA 200.8 | | 3-23-18 | |
| Zinc | ND | 5.0 | EPA 200.8 | | 3-23-18 | |

| | | | | | | |
|-------------------|----------------------|-----|-----------|--|---------|--|
| Client ID: | QA48-20180320 | | | | | |
| Laboratory ID: | 03-183-02 | | | | | |
| Copper | 5.0 | 1.0 | EPA 200.8 | | 3-23-18 | |
| Zinc | ND | 5.0 | EPA 200.8 | | 3-23-18 | |

| | | | | | | |
|-------------------|----------------------|-----|-----------|--|---------|--|
| Client ID: | QA49-20180320 | | | | | |
| Laboratory ID: | 03-183-03 | | | | | |
| Copper | 3.8 | 1.0 | EPA 200.8 | | 3-23-18 | |
| Zinc | ND | 5.0 | EPA 200.8 | | 3-23-18 | |



Date of Report: April 11, 2018
 Samples Submitted: March 20, 2018
 Laboratory Reference: 1803-183
 Project: 14-05806-000

**DISSOLVED METALS
 EPA 200.8
 QUALITY CONTROL**

Matrix: Water
 Units: ug/L (ppb)

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|---------------------|----------|-----|-----------|---------------|---------------|-------|
| METHOD BLANK | | | | | | |
| Laboratory ID: | MB0323D1 | | | | | |
| Copper | ND | 1.0 | EPA 200.8 | | 3-23-18 | |
| Zinc | ND | 5.0 | EPA 200.8 | | 3-23-18 | |

| Analyte | Result | | Spike Level | | Source Result | Percent Recovery | Recovery Limits | RPD | RPD Limit | Flags |
|------------------|-----------|-----|-------------|----|---------------|------------------|-----------------|-----|-----------|-------|
| DUPLICATE | | | | | | | | | | |
| Laboratory ID: | 03-183-01 | | | | | | | | | |
| | ORIG | DUP | | | | | | | | |
| Copper | ND | ND | NA | NA | | NA | NA | NA | 20 | |
| Zinc | ND | ND | NA | NA | | NA | NA | NA | 20 | |

MATRIX SPIKES

| | | | | | | | | | | |
|----------------|-----------|------|------|------|----|----|-----|--------|---|----|
| Laboratory ID: | 03-183-01 | | | | | | | | | |
| | MS | MSD | MS | MSD | | MS | MSD | | | |
| Copper | 74.8 | 78.0 | 80.0 | 80.0 | ND | 94 | 98 | 75-125 | 4 | 20 |
| Zinc | 79.4 | 82.4 | 80.0 | 80.0 | ND | 99 | 103 | 75-125 | 4 | 20 |





Data Qualifiers and Abbreviations

- A - Due to a high sample concentration, the amount spiked is insufficient for meaningful MS/MSD recovery data.
 - B - The analyte indicated was also found in the blank sample.
 - C - The duplicate RPD is outside control limits due to high result variability when analyte concentrations are within five times the quantitation limit.
 - E - The value reported exceeds the quantitation range and is an estimate.
 - F - Surrogate recovery data is not available due to the high concentration of coeluting target compounds.
 - H - The analyte indicated is a common laboratory solvent and may have been introduced during sample preparation, and be impacting the sample result.
 - I - Compound recovery is outside of the control limits.
 - J - The value reported was below the practical quantitation limit. The value is an estimate.
 - K - Sample duplicate RPD is outside control limits due to sample inhomogeneity. The sample was re-extracted and re-analyzed with similar results.
 - L - The RPD is outside of the control limits.
 - M - Hydrocarbons in the gasoline range are impacting the diesel range result.
 - M1 - Hydrocarbons in the gasoline range (toluene-naphthalene) are present in the sample.
 - N - Hydrocarbons in the lube oil range are impacting the diesel range result.
 - N1 - Hydrocarbons in diesel range are impacting lube oil range results.
 - O - Hydrocarbons indicative of heavier fuels are present in the sample and are impacting the gasoline result.
 - P - The RPD of the detected concentrations between the two columns is greater than 40.
 - Q - Surrogate recovery is outside of the control limits.
 - S - Surrogate recovery data is not available due to the necessary dilution of the sample.
 - T - The sample chromatogram is not similar to a typical _____.
 - U - The analyte was analyzed for, but was not detected above the reported sample quantitation limit.
 - U1 - The practical quantitation limit is elevated due to interferences present in the sample.
 - V - Matrix Spike/Matrix Spike Duplicate recoveries are outside control limits due to matrix effects.
 - W - Matrix Spike/Matrix Spike Duplicate RPD are outside control limits due to matrix effects.
 - X - Sample extract treated with a mercury cleanup procedure.
 - X1 - Sample extract treated with a sulfuric acid/silica gel cleanup procedure.
 - Y - The calibration verification for this analyte exceeded the 20% drift specified in method 8260C, and therefore the reported result should be considered an estimate. The overall performance of the calibration verification standard met the acceptance criteria of the method.
 - Z -
- ND - Not Detected at PQL
 PQL - Practical Quantitation Limit
 RPD - Relative Percent Difference





Am Test Inc.
13600 NE 126TH PL
Suite C
Kirkland, WA 98034
(425) 885-1664

Professional
Analytical
Services

Apr 10 2018
On-Site Environmental
14648 NE 95th ST
Redmond, WA 98052
Attention: David Baumeister

Dear David Baumeister:

Enclosed please find the analytical data for your REDMOND PAIRED WATERSHED STUDY project.

The following is a cross correlation of client and laboratory identifications for your convenience.

| CLIENT ID | MATRIX | AMTEST ID | TEST |
|---------------|--------|------------|------------|
| COLM-20180320 | Water | 18-A004631 | Micro, NUT |
| QA48-20180320 | Water | 18-A004632 | Micro, NUT |

Your samples were received on Wednesday, March 21, 2018. At the time of receipt, the samples were logged in and properly maintained prior to the subsequent analysis.

The analytical procedures used at AmTest are well documented and are typically derived from the protocols of the EPA, USDA, FDA or the Army Corps of Engineers.

Following the analytical data you will find the Quality Control (QC) results.

Please note that the detection limits that are listed in the body of the report refer to the Practical Quantitation Limits (PQL's), as opposed to the Method Detection Limits (MDL's).

If you should have any questions pertaining to the data package, please feel free to contact me.

Sincerely,


Aaron W. Young
Laboratory Manager

Project #: 14-05806-000
PO Number: 03-183

BACT = Bacteriological
CONV = Conventionals

MET = Metals
ORG = Organics

NUT=Nutrients
DEM=Demand

MIN=Minerals

Am Test Inc.
13600 NE 126TH PL
Suite C
Kirkland, WA 98034
(425) 885-1664
www.amtestlab.com



*Professional
Analytical
Services*

ANALYSIS REPORT

On-Site Environmental
14648 NE 95th ST
Redmond, WA 98052
Attention: David Baumeister
Project Name: REDMOND PAIRED WATERSHED STUDY
Project #: 14-05806-000
PO Number: 03-183
All results reported on an as received basis.

Date Received: 03/21/18
Date Reported: 4/10/18

AMTEST Identification Number 18-A004631
Client Identification COLM-20180320
Sampling Date 03/20/18, 14:20

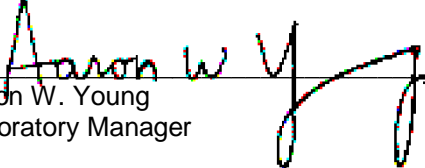
Results

| PARAMETER | RESULT | UNITS | Q | D.L. | METHOD | ANALYST | DATE |
|--------------------------|--------|------------|---|------|-----------|---------|----------|
| Fecal Coliform | < 1 | CFU/100 ml | | 1 | SM 9222D | JM | 03/21/18 |
| Total Nitrogen (NOX&TKN) | 0.68 | mg/l | | 0.1 | | | |
| Total Nitrogen (TKN) | 0.450 | mg/l | | 0.1 | SM4500N | JC | 04/04/18 |
| Nitrate + Nitrite | 0.23 | mg/l | | 0.01 | SM4500NO3 | JC | 03/23/18 |

AMTEST Identification Number 18-A004632
Client Identification QA48-20180320
Sampling Date 03/20/18, 14:20

Results

| PARAMETER | RESULT | UNITS | Q | D.L. | METHOD | ANALYST | DATE |
|--------------------------|--------|------------|---|------|-----------|---------|----------|
| Fecal Coliform | < 1 | CFU/100 ml | | 1 | SM 9222D | JM | 03/21/18 |
| Total Nitrogen (NOX&TKN) | < 0.1 | mg/l | | 0.1 | | | |
| Total Nitrogen (TKN) | < 0.1 | mg/l | | 0.1 | SM4500N | JC | 04/04/18 |
| Nitrate + Nitrite | 0.051 | mg/l | | 0.01 | SM4500NO3 | JC | 03/23/18 |


Aaron W. Young
Laboratory Manager

QC Summary for sample numbers: 18-A004631 to 18-A004632

DUPLICATES

| SAMPLE # | ANALYTE | UNITS | SAMPLE VALUE | DUP VALUE | RPD |
|------------|----------------------|------------|--------------|-----------|------|
| 18-A004632 | Fecal Coliform | CFU/100 ml | < 1 | < 1 | |
| 18-A004666 | Fecal Coliform | CFU/100 ml | 15. | 5. | 100 |
| 18-A004688 | Fecal Coliform | CFU/100 ml | 10. | 6. | 50. |
| 18-A004632 | Total Nitrogen (TKN) | mg/l | < 0.1 | 0.000 | |
| 18-A004811 | Total Nitrogen (TKN) | mg/l | 0.908 | 0.799 | 13. |
| 18-A004947 | Total Nitrogen (TKN) | mg/l | 0.108 | 0.100 | 7.7 |
| 18-A004627 | Nitrate + Nitrite | mg/l | 0.72 | 0.72 | 0.00 |
| 18-A004632 | Nitrate + Nitrite | mg/l | 0.051 | 0.049 | 4.0 |
| 18-A004779 | Nitrate + Nitrite | mg/l | < 0.01 | < 0.01 | |
| 18-A004795 | Nitrate + Nitrite | mg/l | 2.2 | 2.2 | 0.00 |
| 18-A004801 | Nitrate + Nitrite | mg/l | 0.27 | 0.27 | 0.00 |
| 18-A004815 | Nitrate + Nitrite | mg/l | 0.36 | 0.37 | 2.7 |
| 18-A004824 | Nitrate + Nitrite | mg/l | 0.29 | 0.28 | 3.5 |

MATRIX SPIKES

| SAMPLE # | ANALYTE | UNITS | SAMPLE VALUE | SMPL+ SPK | SPK AMT | RECOVERY |
|------------|----------------------|-------|--------------|-----------|---------|----------|
| 18-A004632 | Total Nitrogen (TKN) | mg/l | < 0.1 | 1.06 | 1.00 | 106.00 % |
| 18-A004811 | Total Nitrogen (TKN) | mg/l | 0.908 | 1.91 | 1.00 | 100.20 % |
| 18-A004947 | Total Nitrogen (TKN) | mg/l | 0.108 | 1.09 | 1.00 | 98.20 % |
| 18-A004627 | Nitrate + Nitrite | mg/l | 0.72 | 1.7 | 1.0 | 98.00 % |
| 18-A004632 | Nitrate + Nitrite | mg/l | 0.051 | 1.0 | 1.0 | 94.90 % |
| 18-A004779 | Nitrate + Nitrite | mg/l | < 0.01 | 1.1 | 1.0 | 110.00 % |
| 18-A004795 | Nitrate + Nitrite | mg/l | 2.2 | 3.3 | 1.0 | 110.00 % |
| 18-A004801 | Nitrate + Nitrite | mg/l | 0.27 | 1.2 | 1.0 | 93.00 % |
| 18-A004815 | Nitrate + Nitrite | mg/l | 0.36 | 1.3 | 1.0 | 94.00 % |
| 18-A004824 | Nitrate + Nitrite | mg/l | 0.29 | 1.2 | 1.0 | 91.00 % |

STANDARD REFERENCE MATERIALS

| ANALYTE | UNITS | TRUE VALUE | MEASURED VALUE | RECOVERY |
|----------------------|-------|------------|----------------|----------|
| Total Nitrogen (TKN) | mg/l | 1.00 | 1.02 | 102. % |
| Total Nitrogen (TKN) | mg/l | 1.00 | 1.03 | 103. % |
| Total Nitrogen (TKN) | mg/l | 1.00 | 1.03 | 103. % |
| Nitrate + Nitrite | mg/l | 1.0 | 0.96 | 96.0 % |
| Nitrate + Nitrite | mg/l | 1.0 | 0.96 | 96.0 % |
| Nitrate + Nitrite | mg/l | 1.0 | 0.92 | 92.0 % |

QC Summary for sample numbers: 18-A004631 to 18-A004632...

BLANKS

| ANALYTE | UNITS | RESULT |
|----------------------|------------|--------|
| Fecal Coliform | CFU/100 ml | < 1 |
| Fecal Coliform | CFU/100 ml | < 1 |
| Fecal Coliform | CFU/100 ml | < 1 |
| Total Nitrogen (TKN) | mg/l | < 0.1 |
| Total Nitrogen (TKN) | mg/l | < 0.1 |
| Total Nitrogen (TKN) | mg/l | < 0.1 |
| Nitrate + Nitrite | mg/l | < 0.01 |
| Nitrate + Nitrite | mg/l | < 0.01 |
| Nitrate + Nitrite | mg/l | < 0.01 |

METER CALIBRATION LOG - Redmond Paired Watershed Study

| | | | |
|-----------------------------------|---------------|-------------|--|
| Project Number: | 14-05806-000 | | |
| Personnel Performing Calibration: | PB | | |
| Meter: | DSS #2 | | |
| Date/Time: | 3-20-18 12:00 | | |
| Barometric Pressure Start of Day: | mmHg: 710.7 | Time: 12:00 | |
| Barometric Pressure End of Day: | mmHg: | Time: | |

| PRE Field Run CALIBRATION | Meter Reading | Buffer / Cal Std | Temp °C | Comments |
|---------------------------|---------------|------------------|---------|--------------------|
| Conductivity (µS/cm) | 1.3 | 0 | 22.9 | lab grade DI |
| Conductivity (µS/cm) | 1011 | 1,000 | 22.9 | calibrated to 1000 |
| Conductivity (µS/cm) | 100.0 | 100 | 22.7 | |
| DO % Saturation | 100.1 | 100 | 22.3 | |

| POST Field Run CHECK | Meter Reading | Buffer / Cal Std | Temp °C | Comments |
|----------------------|---------------|------------------|---------|------------|
| Conductivity (µS/cm) | 14.8 | 0 | 22.5 | HERRERA DI |
| Conductivity (µS/cm) | 99.4 | 100 | 22.6 | |
| DO % Saturation | 100.4 | 100 | 21.4 | |

| |
|---|
| Calibration Procedures: |
| Rinse Multimeter Sonde Between Each Operation |
| Rinse 3 times with tap water, 3 times with deionized water, then 3 times with the solution to be used for calibrating or testing. |

| |
|---|
| Conductivity Calibration Notes: |
| 1. Dry the conductivity probe with a lab tissue (e.g., KimWipes®) and DI water. |
| 2. Fill calibration cup to within a centimeter of the top of the calibration cup with DI water (0 µS). |
| 3. Fill the calibration cup with 1,000 µS standard so that the temperature/conductivity probe is submerged. |
| 4. Make sure there are no bubbles in the cell; wait 2 minutes. |
| 5. Enter the appropriate standard value (1,000 µS/cm or 1.0 mS/cm) for Sp Cond. |
| 6. Check conductivity using 100 µS/cm standard. |

| |
|---|
| Dissolved Oxygen Calibration Notes: |
| 1. Fill the calibration cup with about 1/2 inch of DI; it should be below the sensor cap. |
| 2. Use KimWipes® to dry any droplets from the sensor cap. |
| 3. Invert calibration cup's cap and gently rest it on the cup. |
| 4. Wait 5 minutes, making sure that temperature stabilizes. |
| 5. Determine local barometric pressure (mm Hg) and enter this value into the meter. |
| 6. Click "Calibrate". "Calibrate Successful" will be displayed. |
| 7. To retain calibration accuracy between measurements, store with the sensor immersed in water or within a water-saturated air environment such as a sealed storage cup with at least 10 ml of water. |
| 8. It is important to have the water-saturated air and the sensor at the same temperature. Therefore, store a jar of DI in the same environment as the sonde and calibrate in a similar air temperature as the water and sonde. |
| 9. Keep probe out of direct sun or wind. |



FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: BB
 Sample Date: 3-20-18 Sample Time: 1420 PDT:
 Base Flow or Storm Event? Field Filtered Time: 1425 PST:
 (Must filter within 15 minutes of collection)

SITE ID: COLM
 Project Number: 14-05806-000



Project Name: Redmond Paired Watershed Study

Current Weather and Temp: Sunny & 54°F

Water Quality Sampling

Sample ID: COLM-20180320

| Parameter | Bottle Type | Bottle Volume | # Bottles | Preservative | Duplicated? |
|---------------------------|-------------|---------------|-----------|--------------------------------|-------------|
| TSS and Turbidity | HDPE | 1L | 1 | NA | N ↓ |
| DOC * | HDPE | 250 ml | 1 | HCL | |
| Fecal Col. Bact. | HDPE | 250 ml | 1 | EDTA | |
| T. Phosphorous | HDPE | 250 ml | 1 | H ₂ SO ₄ | |
| T. Nitrogen | HDPE | 250 ml | 1 | H ₂ SO ₄ | |
| Diss. Cu and Zn * | HDPE | 250 ml | 1 | HNO ₃ | |
| Hardness, Total Cu and Zn | HDPE | 500 ml | 1 | HNO ₃ | |

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID: NA
 Filter blank sample ID: QA49-20180320
 Transfer blank sample ID: QA48-20180320

Visual and Olfactory Conditions:

Clarity: clear
 Color: yellow
 Odor: none
 Sheen: ↓
 Floatables: ↓

LABORATORY DELIVERY

Date: _____ Time: _____

Quality Assurance

Checked By: SLC-flv Signature: [Signature]
 Date Checked: 5-23-18 Time: _____
 Data Entered into Database? YES NO initials: _____
 Date Entered: _____ Time: _____
 Notes: _____

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

YSI Pro Plus (15D100020) _____
 YSI Pro DSS 1 _____
 YSI Pro DSS 2 _____

Stream-Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): 5.54
 Reference Point (description): SG

Water Quality Measurements

Temperature (°C) 7.0
 Specific Conductivity (µs/cm) 31.2
 Dissolved Oxygen (mg/L) 10.92



HERRERA

Data Quality Assurance Worksheet

Project Name/No./Client: Redmond Paired Watershed Study / 14-05806-000 / City of Redmond

Laboratory/Parameters: OnSite Environmental : TSS, turbidity, hardness, DOC, TP, Dissolved & Total Cu, Zn / AmTest: Total nitrogen, fecal coliform bacteria

Sample Date/Sample ID: 3/20/2018 / COLM only, Transfer Blank (QA48), filter blank (QA49)

By G. Catarra

Date 4/24/18 Page 1 of 2

Checked: initials JL

date 5/23/2018

| Parameter | Completeness/ Methodology | Pre-preservation Holding Times (minutes) | | Total Holding Times (days) | | Method Blanks Reporting Limit | Matrix Spikes/ Surrogate Recovery (%) | | Lab Control Samples Recovery (%) | | Lab Duplicates RPD (%) | | Field Duplicates RPD (%) | | Instrument Calibration/ Performance | ACTION |
|-------------------------------------|------------------------------|--|------|-------------------------------|------|--|---|-------------------|--|-------------------|---------------------------|-------------------|-----------------------------|-------------------|---|---|
| | | Reported | Goal | Reported | Goal | | Reported | Goal ¹ | Reported | Goal ¹ | Reported | Goal ¹ | Reported | Goal ¹ | | |
| TSS | OK / SM 2540D | NA | NA | 2 | ≤7 | ≤1.0 mg/L 1.0 mg/L | NA | NA | 90 | ±20 | NC | ≤25 | NS | ≤25 | OK | NONE TB=ND |
| Turbidity | OK / EPA 180.1 | NA | NA | 1 | ≤2 | ≤0.1 NTU 0.1 NTU | NA | NA | NA | ±10 | 3 | ≤25 | NS | ≤25 | OK | NONE TB=ND |
| Hardness | OK / SM 2340B | NA | NA | 2-6 | ≤180 | ≤1.0 mg/L 1.0 mg/L | 95,99 | ±25 | 101 | ±15 | 6 | ≤20 | NS | ≤20 | OK | NONE TB=ND |
| DOC | OK / SM 5310B | <15 | ≤15 | 6 | ≤28 | ≤1.0 mg/L 1.0 mg/L | 104 | ±25 | 107 | ±15 | 3 | ≤20 | NS | ≤20 | OK | NONE TB=ND, FB=ND |
| Total Phosphorus | OK / EPA 365.1 | NA | NA | 1 | ≤28 | ≤0.01 mg/L 0.01 mg/L | 101 | ±25 | 99 | ±20 | NC | ≤20 | NS | ≤20 | OK | NONE TB=ND |
| Total Nitrogen (TKN + N+N) | OK/ SM 4500 N-B | NA | NA | 3-12 | ≤28 | ≤0.1 mg/L 0.1 mg/L | 95,106 | ±25 | 92-103 | ±20 | NC,4 | ≤20 | NS | ≤20 | OK | J N+N AND TOTAL N TB=ND (TKN) TB= 0.051 (N+N) |

¹ If the sample or duplicate value is less than five times the reporting limit, the difference is calculated rather than the relative percent difference (RPD). The QA goal is a difference <2 times the detection limit instead of the number indicated in the goal column.

NA – not applicable or not available; NC – not calculable due to one or more values below the detection limit; NS – field duplicate not sampled.



Data Quality Assurance Worksheet

By G. Catarra

Project Name/No./Client: Redmond Paired Watershed Study / 14-05806-000 / City of Redmond

Date 4/24/18 Page 2 of 2

Laboratory/Parameters: OnSite Environmental : TSS, turbidity, hardness, DOC, TP, Dissolved & Total Cu, Zn / AmTest: total nitrogen, fecal coliform bacteria

Checked: initials
JL

Sample Date/Sample ID: 3/20/2018 / COLM only, Transfer Blank (QA48), filter blank (QA49)

date 5/23/2018

| Parameter | Completeness/ Methodology | Pre-preservation Holding Times (minutes) | | Total Holding Times (days) | | Method Blanks Reporting Limit | Matrix Spikes/ Surrogate Recovery (%) | | Lab Control Samples Recovery (%) | | Lab Duplicates RPD (%) | | Field Duplicates RPD (%) | | Instrument Calibration/ Performance | ACTION |
|------------------|------------------------------|--|------|-------------------------------|------|--|---|-------------------|--|------|---------------------------|-------------------|-----------------------------|-------------------|---|--|
| | | Reported | Goal | Reported | Goal | | Reported | Goal ¹ | Reported | Goal | Reported | Goal ¹ | Reported | Goal ¹ | | |
| Total Copper | OK/ EPA 200.8 | NA | NA | 3 | ≤180 | ≤1.0 µg/L 1.0 µg/L | 103,106 | ±25 | NR | ±15 | NC | ≤20 | NS | ≤20 | OK | NONE TB=5.8, OK- SAMPLE ND |
| Total Zinc | OK/ EPA 200.8 | NA | NA | 3 | ≤180 | ≤5.0 µg/L 5.0 µg/L | 108,104 | ±25 | NR | ±15 | NC | ≤20 | NS | ≤20 | OK | NONE TB=ND |
| Dissolved Copper | OK/ EPA 200.8 | <15 | ≤15 | 3 | ≤180 | ≤1.0 µg/L 1.0 µg/L | 94,98 | ±25 | NR | ±15 | NC | ≤20 | NS | ≤20 | OK | NONE TB=5.0, OK- SAMPLE ND FB= 3.8, OK-SAMPLE ND |
| Dissolved Zinc | OK/ EPA 200.8 | <15 | ≤15 | 3 | ≤180 | ≤5.0 µg/L 5.0 µg/L | 99,103 | ±25 | NR | ±15 | NC | ≤20 | NS | ≤20 | OK | NONE |
| Fecal Coliform | OK/ SM 9222D | NA | NA | 1 | ≤1 | ≤1.0 cfu/ 100mL 10 cfu/ 100mL | NA | NA | NA | NA | NC | ≤35 | NS | ≤50 | OK | NONE TB=ND |

¹ If the sample or duplicate value is less than five times the reporting limit, the difference is calculated rather than the relative percent difference (RPD). The QA goal is a difference <2 times the detection limit instead of the number indicated in the goal column.

NA – not applicable or not available; NC – not calculable due to one or more values below the detection limit; NS – field duplicate not sampled.



14648 NE 95th Street, Redmond, WA 98052 • (425) 883-3881

June 13, 2018

George Iftner
Herrera Environmental Consultants, Inc.
2200 6th Avenue, Suite 1100
Seattle, WA 98121

Re: Analytical Data for Project 14-05806-000
Laboratory Reference No. 1805-207

Dear George:

Enclosed are the analytical results and associated quality control data for samples submitted on May 21, 2018.

The standard policy of OnSite Environmental, Inc. is to store your samples for 30 days from the date of receipt. If you require longer storage, please contact the laboratory.

We appreciate the opportunity to be of service to you on this project. If you have any questions concerning the data, or need additional information, please feel free to call me.

Sincerely,

A handwritten signature in black ink, appearing to read "Blair Goodrow", enclosed within a large, loopy circular flourish.

Blair Goodrow
Project Manager

Enclosures



OnSite Environmental, Inc. 14648 NE 95th Street, Redmond, WA 98052 (425) 883-3881

This report pertains to the samples analyzed in accordance with the chain of custody, and is intended only for the use of the individual or company to whom it is addressed.

Date of Report: June 13, 2018
Samples Submitted: May 21, 2018
Laboratory Reference: 1805-207
Project: 14-05806-000

Case Narrative

Samples were collected on May 21, 2018 and received by the laboratory on May 21, 2018. They were maintained at the laboratory at a temperature of 2°C to 6°C.

Please note that any and all soil sample results are reported on a dry-weight basis, unless otherwise noted below.

General QA/QC issues associated with the analytical data enclosed in this laboratory report will be indicated with a reference to a comment or explanation on the Data Qualifier page. More complex and involved QA/QC issues will be discussed in detail below.



Date of Report: June 13, 2018
 Samples Submitted: May 21, 2018
 Laboratory Reference: 1805-207
 Project: 14-05806-000

**TOTAL SUSPENDED SOLIDS
 SM 2540D**

Matrix: Water
 Units: mg/L

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|------------------------|----------------------|-----|----------|---------------|---------------|-------|
| Client ID: | COLM-20180521 | | | | | |
| Laboratory ID: | 05-207-01 | | | | | |
| Total Suspended Solids | 1.6 | 1.0 | SM 2540D | 5-22-18 | 5-23-18 | |

| | | | | | | |
|------------------------|-----------------------|-----|----------|---------|---------|--|
| Client ID: | COUMI-20180521 | | | | | |
| Laboratory ID: | 05-207-02 | | | | | |
| Total Suspended Solids | 12 | 1.0 | SM 2540D | 5-22-18 | 5-23-18 | |

| | | | | | | |
|------------------------|-----------------------|-----|----------|---------|---------|--|
| Client ID: | COUMO-20180521 | | | | | |
| Laboratory ID: | 05-207-03 | | | | | |
| Total Suspended Solids | 4.4 | 1.0 | SM 2540D | 5-22-18 | 5-23-18 | |

| | | | | | | |
|------------------------|-----------------------|-----|----------|---------|---------|--|
| Client ID: | EVAMS-20180521 | | | | | |
| Laboratory ID: | 05-207-04 | | | | | |
| Total Suspended Solids | 6.0 | 1.0 | SM 2540D | 5-22-18 | 5-23-18 | |

| | | | | | | |
|------------------------|------------------------|-----|----------|---------|---------|--|
| Client ID: | EVALSS-20180521 | | | | | |
| Laboratory ID: | 05-207-05 | | | | | |
| Total Suspended Solids | 8.6 | 1.0 | SM 2540D | 5-22-18 | 5-23-18 | |

| | | | | | | |
|------------------------|-----------------------|-----|----------|---------|---------|--|
| Client ID: | MONMN-20180521 | | | | | |
| Laboratory ID: | 05-207-06 | | | | | |
| Total Suspended Solids | 2.0 | 1.0 | SM 2540D | 5-22-18 | 5-23-18 | |

| | | | | | | |
|------------------------|-----------------------|-----|----------|---------|---------|--|
| Client ID: | MONMS-20180521 | | | | | |
| Laboratory ID: | 05-207-07 | | | | | |
| Total Suspended Solids | 2.2 | 1.0 | SM 2540D | 5-22-18 | 5-23-18 | |



Date of Report: June 13, 2018
 Samples Submitted: May 21, 2018
 Laboratory Reference: 1805-207
 Project: 14-05806-000

**TOTAL SUSPENDED SOLIDS
SM 2540D**

Matrix: Water
 Units: mg/L

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|------------------------|----------------------|-----|----------|---------------|---------------|-------|
| Client ID: | MONM-20180521 | | | | | |
| Laboratory ID: | 05-207-08 | | | | | |
| Total Suspended Solids | 2.4 | 1.0 | SM 2540D | 5-22-18 | 5-23-18 | |

| | | | | | | |
|------------------------|-----------------------|-----|----------|---------|---------|--|
| Client ID: | SEIMN-20180521 | | | | | |
| Laboratory ID: | 05-207-09 | | | | | |
| Total Suspended Solids | 4.6 | 1.0 | SM 2540D | 5-22-18 | 5-23-18 | |

| | | | | | | |
|------------------------|-----------------------|-----|----------|---------|---------|--|
| Client ID: | SEIMS-20180521 | | | | | |
| Laboratory ID: | 05-207-10 | | | | | |
| Total Suspended Solids | 6.2 | 1.0 | SM 2540D | 5-22-18 | 5-23-18 | |

| | | | | | | |
|------------------------|-----------------------|-----|----------|---------|---------|--|
| Client ID: | TOSMI-20180521 | | | | | |
| Laboratory ID: | 05-207-11 | | | | | |
| Total Suspended Solids | 3.6 | 1.0 | SM 2540D | 5-22-18 | 5-23-18 | |

| | | | | | | |
|------------------------|-----------------------|-----|----------|---------|---------|--|
| Client ID: | TOSMO-20180521 | | | | | |
| Laboratory ID: | 05-207-12 | | | | | |
| Total Suspended Solids | 2.8 | 1.0 | SM 2540D | 5-22-18 | 5-23-18 | |

| | | | | | | |
|------------------------|-----------------------|-----|----------|---------|---------|--|
| Client ID: | TYLMI-20180521 | | | | | |
| Laboratory ID: | 05-207-13 | | | | | |
| Total Suspended Solids | 5.4 | 1.0 | SM 2540D | 5-22-18 | 5-23-18 | |

| | | | | | | |
|------------------------|-----------------------|-----|----------|---------|---------|--|
| Client ID: | TYLMO-20180521 | | | | | |
| Laboratory ID: | 05-207-14 | | | | | |
| Total Suspended Solids | 1.8 | 1.0 | SM 2540D | 5-22-18 | 5-23-18 | |



Date of Report: June 13, 2018
Samples Submitted: May 21, 2018
Laboratory Reference: 1805-207
Project: 14-05806-000

**TOTAL SUSPENDED SOLIDS
SM 2540D**

Matrix: Water
Units: mg/L

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|------------------------|----------------------|------------|---------------|----------------------|----------------------|--------------|
| Client ID: | QA48-20180521 | | | | | |
| Laboratory ID: | 05-207-15 | | | | | |
| Total Suspended Solids | 6.4 | 1.0 | SM 2540D | 5-22-18 | 5-23-18 | |



Date of Report: June 13, 2018
 Samples Submitted: May 21, 2018
 Laboratory Reference: 1805-207
 Project: 14-05806-000

**TOTAL SUSPENDED SOLIDS
 SM 2540D
 QUALITY CONTROL**

Matrix: Water
 Units: mg/L

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|------------------------|-----------|-----|----------|---------------|---------------|-------|
| METHOD BLANK | | | | | | |
| Laboratory ID: | MB0522W1 | | | | | |
| Total Suspended Solids | ND | 1.0 | SM 2540D | 5-22-18 | 5-23-18 | |

| Analyte | Result | Spike Level | Source Result | Percent Recovery | Recovery Limits | RPD | RPD Limit | Flags |
|------------------------|-------------|-------------|---------------|------------------|-----------------|-----|-----------|-------|
| DUPLICATE | | | | | | | | |
| Laboratory ID: | 05-207-12 | | | | | | | |
| | ORIG | DUP | | | | | | |
| Total Suspended Solids | 2.80 | 3.00 | NA | NA | NA | 7 | 17 | |

| | | | | | | | | |
|------------------------|-------------|-----|----|----|--------|----|----|--|
| SPIKE BLANK | | | | | | | | |
| Laboratory ID: | SB0522W1 | | | | | | | |
| | SB | SB | | SB | | | | |
| Total Suspended Solids | 90.0 | 100 | NA | 90 | 76-114 | NA | NA | |



Date of Report: June 13, 2018
 Samples Submitted: May 21, 2018
 Laboratory Reference: 1805-207
 Project: 14-05806-000

TURBIDITY
EPA 180.1

Matrix: Water
 Units: NTU

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|-------------------|----------------------|------|-----------|---------------|---------------|-------|
| Client ID: | COLM-20180521 | | | | | |
| Laboratory ID: | 05-207-01 | | | | | |
| Turbidity | 2.0 | 0.10 | EPA 180.1 | 5-22-18 | 5-22-18 | |

| | | | | | | |
|-------------------|-----------------------|------|-----------|---------|---------|--|
| Client ID: | COUMI-20180521 | | | | | |
| Laboratory ID: | 05-207-02 | | | | | |
| Turbidity | 5.9 | 0.10 | EPA 180.1 | 5-22-18 | 5-22-18 | |

| | | | | | | |
|-------------------|-----------------------|------|-----------|---------|---------|--|
| Client ID: | COUMO-20180521 | | | | | |
| Laboratory ID: | 05-207-03 | | | | | |
| Turbidity | 3.6 | 0.10 | EPA 180.1 | 5-22-18 | 5-22-18 | |

| | | | | | | |
|-------------------|-----------------------|------|-----------|---------|---------|--|
| Client ID: | EVAMS-20180521 | | | | | |
| Laboratory ID: | 05-207-04 | | | | | |
| Turbidity | 3.1 | 0.10 | EPA 180.1 | 5-22-18 | 5-22-18 | |

| | | | | | | |
|-------------------|------------------------|------|-----------|---------|---------|--|
| Client ID: | EVALSS-20180521 | | | | | |
| Laboratory ID: | 05-207-05 | | | | | |
| Turbidity | 2.9 | 0.10 | EPA 180.1 | 5-22-18 | 5-22-18 | |

| | | | | | | |
|-------------------|-----------------------|------|-----------|---------|---------|--|
| Client ID: | MONMN-20180521 | | | | | |
| Laboratory ID: | 05-207-06 | | | | | |
| Turbidity | 1.9 | 0.10 | EPA 180.1 | 5-22-18 | 5-22-18 | |

| | | | | | | |
|-------------------|-----------------------|------|-----------|---------|---------|--|
| Client ID: | MONMS-20180521 | | | | | |
| Laboratory ID: | 05-207-07 | | | | | |
| Turbidity | 1.6 | 0.10 | EPA 180.1 | 5-22-18 | 5-22-18 | |



Date of Report: June 13, 2018
 Samples Submitted: May 21, 2018
 Laboratory Reference: 1805-207
 Project: 14-05806-000

TURBIDITY
EPA 180.1

Matrix: Water
 Units: NTU

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|-------------------|----------------------|------|-----------|---------------|---------------|-------|
| Client ID: | MONM-20180521 | | | | | |
| Laboratory ID: | 05-207-08 | | | | | |
| Turbidity | 2.3 | 0.10 | EPA 180.1 | 5-22-18 | 5-22-18 | |

| | | | | | | |
|-------------------|-----------------------|------|-----------|---------|---------|--|
| Client ID: | SEIMN-20180521 | | | | | |
| Laboratory ID: | 05-207-09 | | | | | |
| Turbidity | 2.7 | 0.10 | EPA 180.1 | 5-22-18 | 5-22-18 | |

| | | | | | | |
|-------------------|-----------------------|------|-----------|---------|---------|--|
| Client ID: | SEIMS-20180521 | | | | | |
| Laboratory ID: | 05-207-10 | | | | | |
| Turbidity | 3.1 | 0.10 | EPA 180.1 | 5-22-18 | 5-22-18 | |

| | | | | | | |
|-------------------|-----------------------|------|-----------|---------|---------|--|
| Client ID: | TOSMI-20180521 | | | | | |
| Laboratory ID: | 05-207-11 | | | | | |
| Turbidity | 2.0 | 0.10 | EPA 180.1 | 5-22-18 | 5-22-18 | |

| | | | | | | |
|-------------------|-----------------------|------|-----------|---------|---------|--|
| Client ID: | TOSMO-20180521 | | | | | |
| Laboratory ID: | 05-207-12 | | | | | |
| Turbidity | 2.1 | 0.10 | EPA 180.1 | 5-22-18 | 5-22-18 | |

| | | | | | | |
|-------------------|-----------------------|------|-----------|---------|---------|--|
| Client ID: | TYLMI-20180521 | | | | | |
| Laboratory ID: | 05-207-13 | | | | | |
| Turbidity | 2.7 | 0.10 | EPA 180.1 | 5-22-18 | 5-22-18 | |

| | | | | | | |
|-------------------|-----------------------|------|-----------|---------|---------|--|
| Client ID: | TYLMO-20180521 | | | | | |
| Laboratory ID: | 05-207-14 | | | | | |
| Turbidity | 1.4 | 0.10 | EPA 180.1 | 5-22-18 | 5-22-18 | |



Date of Report: June 13, 2018
Samples Submitted: May 21, 2018
Laboratory Reference: 1805-207
Project: 14-05806-000

TURBIDITY
EPA 180.1

Matrix: Water
Units: NTU

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|-------------------|----------------------|------------|---------------|----------------------|----------------------|--------------|
| Client ID: | QA48-20180521 | | | | | |
| Laboratory ID: | 05-207-15 | | | | | |
| Turbidity | 3.8 | 0.10 | EPA 180.1 | 5-22-18 | 5-22-18 | |



Date of Report: June 13, 2018
 Samples Submitted: May 21, 2018
 Laboratory Reference: 1805-207
 Project: 14-05806-000

**TURBIDITY
 EPA 180.1
 QUALITY CONTROL**

Matrix: Water
 Units: NTU

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|---------------------|-----------|------|-----------|---------------|---------------|-------|
| METHOD BLANK | | | | | | |
| Laboratory ID: | MB0522W1 | | | | | |
| Turbidity | ND | 0.10 | EPA 180.1 | 5-22-18 | 5-22-18 | |

| Analyte | Result | Spike Level | Source Result | Percent Recovery | Recovery Limits | RPD | RPD Limit | Flags |
|------------------|-------------|-------------|---------------|------------------|-----------------|-----|-----------|-------|
| DUPLICATE | | | | | | | | |
| Laboratory ID: | 05-207-02 | | | | | | | |
| | ORIG | DUP | | | | | | |
| Turbidity | 5.90 | 6.07 | NA | NA | NA | NA | 3 | 15 |



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HARDNESS
EPA 200.7/SM 2340B

Matrix: Water
 Units: mg eqt. CaCO₃/L (ppm)

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|-------------------|----------------------|-----|----------------|---------------|---------------|-------|
| Client ID: | COLM-20180521 | | | | | |
| Laboratory ID: | 05-207-01 | | | | | |
| Hardness | 13 | 1.0 | 200.7/SM 2340B | 5-24-18 | 5-29-18 | |

| | | | | | | |
|-------------------|-----------------------|-----|----------------|---------|---------|--|
| Client ID: | COUMI-20180521 | | | | | |
| Laboratory ID: | 05-207-02 | | | | | |
| Hardness | 150 | 1.0 | 200.7/SM 2340B | 5-24-18 | 5-29-18 | |

| | | | | | | |
|-------------------|-----------------------|-----|----------------|---------|---------|--|
| Client ID: | COUMO-20180521 | | | | | |
| Laboratory ID: | 05-207-03 | | | | | |
| Hardness | 120 | 1.0 | 200.7/SM 2340B | 5-24-18 | 5-29-18 | |

| | | | | | | |
|-------------------|-----------------------|-----|----------------|---------|---------|--|
| Client ID: | EVAMS-20180521 | | | | | |
| Laboratory ID: | 05-207-04 | | | | | |
| Hardness | 100 | 1.0 | 200.7/SM 2340B | 5-24-18 | 5-29-18 | |

| | | | | | | |
|-------------------|------------------------|-----|----------------|---------|---------|--|
| Client ID: | EVALSS-20180521 | | | | | |
| Laboratory ID: | 05-207-05 | | | | | |
| Hardness | 89 | 1.0 | 200.7/SM 2340B | 5-24-18 | 5-29-18 | |

| | | | | | | |
|-------------------|-----------------------|-----|----------------|---------|---------|--|
| Client ID: | MONMN-20180521 | | | | | |
| Laboratory ID: | 05-207-06 | | | | | |
| Hardness | 88 | 1.0 | 200.7/SM 2340B | 5-24-18 | 5-29-18 | |

| | | | | | | |
|-------------------|-----------------------|-----|----------------|---------|---------|--|
| Client ID: | MONMS-20180521 | | | | | |
| Laboratory ID: | 05-207-07 | | | | | |
| Hardness | 150 | 1.0 | 200.7/SM 2340B | 5-24-18 | 5-29-18 | |



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HARDNESS
EPA 200.7/SM 2340B

Matrix: Water
 Units: mg eqt. CaCO₃/L (ppm)

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|-------------------|----------------------|-----|----------------|---------------|---------------|-------|
| Client ID: | MONM-20180521 | | | | | |
| Laboratory ID: | 05-207-08 | | | | | |
| Hardness | 98 | 1.0 | 200.7/SM 2340B | 5-24-18 | 5-29-18 | |

| | | | | | | |
|-------------------|-----------------------|-----|----------------|---------|---------|--|
| Client ID: | SEIMN-20180521 | | | | | |
| Laboratory ID: | 05-207-09 | | | | | |
| Hardness | 36 | 1.0 | 200.7/SM 2340B | 5-24-18 | 5-29-18 | |

| | | | | | | |
|-------------------|-----------------------|-----|----------------|---------|---------|--|
| Client ID: | SEIMS-20180521 | | | | | |
| Laboratory ID: | 05-207-10 | | | | | |
| Hardness | 49 | 1.0 | 200.7/SM 2340B | 5-24-18 | 5-29-18 | |

| | | | | | | |
|-------------------|-----------------------|-----|----------------|---------|---------|--|
| Client ID: | TOSMI-20180521 | | | | | |
| Laboratory ID: | 05-207-11 | | | | | |
| Hardness | 130 | 1.0 | 200.7/SM 2340B | 5-24-18 | 5-29-18 | |

| | | | | | | |
|-------------------|-----------------------|-----|----------------|---------|---------|--|
| Client ID: | TOSMO-20180521 | | | | | |
| Laboratory ID: | 05-207-12 | | | | | |
| Hardness | 120 | 1.0 | 200.7/SM 2340B | 5-24-18 | 5-29-18 | |

| | | | | | | |
|-------------------|-----------------------|-----|----------------|---------|---------|--|
| Client ID: | TYLMI-20180521 | | | | | |
| Laboratory ID: | 05-207-13 | | | | | |
| Hardness | 110 | 1.0 | 200.7/SM 2340B | 5-24-18 | 5-29-18 | |

| | | | | | | |
|-------------------|-----------------------|-----|----------------|---------|---------|--|
| Client ID: | TYLMO-20180521 | | | | | |
| Laboratory ID: | 05-207-14 | | | | | |
| Hardness | 96 | 1.0 | 200.7/SM 2340B | 5-24-18 | 5-29-18 | |



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HARDNESS
EPA 200.7/SM 2340B

Matrix: Water
Units: mg eqt. CaCO₃/L (ppm)

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|-------------------|----------------------|------------|----------------|----------------------|----------------------|--------------|
| Client ID: | QA48-20180521 | | | | | |
| Laboratory ID: | 05-207-15 | | | | | |
| Hardness | 48 | 1.0 | 200.7/SM 2340B | 5-24-18 | 5-29-18 | |



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HARDNESS
EPA 200.7/SM 2340B
QUALITY CONTROL

Matrix: Water
 Units: mg eqt. CaCO₃/L (ppm)

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|---------------------|-----------|-----|----------------|---------------|---------------|-------|
| METHOD BLANK | | | | | | |
| Laboratory ID: | MB0524WH1 | | | | | |
| Hardness | ND | 1.0 | 200.7/SM 2340B | 5-24-18 | 5-29-18 | |

| Analyte | Result | Spike Level | Source Result | Percent Recovery | Recovery Limits | RPD | RPD Limit | Flags |
|------------------|------------|-------------|---------------|------------------|-----------------|-----|-----------|-------|
| DUPLICATE | | | | | | | | |
| Laboratory ID: | 05-207-02 | | | | | | | |
| | ORIG | DUP | | | | | | |
| Hardness | 150 | 152 | NA | NA | NA | 1 | 20 | |

| Analyte | Result | Spike Level | Source Result | Percent Recovery | Recovery Limits | RPD | RPD Limit | Flags | | |
|----------------------|------------|-------------|---------------|------------------|-----------------|-----|-----------|--------|---|----|
| MATRIX SPIKES | | | | | | | | | | |
| Laboratory ID: | 05-207-02 | | | | | | | | | |
| | MS | MSD | MS | MSD | MS | MSD | | | | |
| Hardness | 300 | 294 | 132 | 132 | 150 | 114 | 109 | 75-125 | 2 | 20 |

| Analyte | Result | Spike Level | Source Result | Percent Recovery | Recovery Limits | RPD | RPD Limit | Flags | |
|--------------------|------------|-------------|---------------|------------------|-----------------|-----|-----------|-------|----|
| SPIKE BLANK | | | | | | | | | |
| Laboratory ID: | SB0524WH1 | | | | | | | | |
| | SB | | SB | | SB | | | | |
| Hardness | 142 | | 132 | | 108 | | 80-120 | NA | NA |



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 Project: 14-05806-000

**DISSOLVED ORGANIC CARBON
 SM 5310B**

Matrix: Water
 Units: mg/L

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|--------------------------|------------------------|-----|----------|---------------|---------------|-------|
| Client ID: | COLM-20180521 | | | | | |
| Laboratory ID: | 05-207-01 | | | | | |
| Dissolved Organic Carbon | 13 | 1.0 | SM 5310B | 5-25-18 | 5-25-18 | |
| Client ID: | COUMI-20180521 | | | | | |
| Laboratory ID: | 05-207-02 | | | | | |
| Dissolved Organic Carbon | 2.9 | 1.0 | SM 5310B | 5-25-18 | 5-25-18 | |
| Client ID: | COUMO-20180521 | | | | | |
| Laboratory ID: | 05-207-03 | | | | | |
| Dissolved Organic Carbon | 3.7 | 1.0 | SM 5310B | 5-25-18 | 5-25-18 | |
| Client ID: | EVAMS-20180521 | | | | | |
| Laboratory ID: | 05-207-04 | | | | | |
| Dissolved Organic Carbon | 3.2 | 1.0 | SM 5310B | 5-25-18 | 5-25-18 | |
| Client ID: | EVALSS-20180521 | | | | | |
| Laboratory ID: | 05-207-05 | | | | | |
| Dissolved Organic Carbon | 2.5 | 1.0 | SM 5310B | 5-25-18 | 5-25-18 | |
| Client ID: | MONMN-20180521 | | | | | |
| Laboratory ID: | 05-207-06 | | | | | |
| Dissolved Organic Carbon | 3.3 | 1.0 | SM 5310B | 5-25-18 | 5-25-18 | |
| Client ID: | MONMS-20180521 | | | | | |
| Laboratory ID: | 05-207-07 | | | | | |
| Dissolved Organic Carbon | 3.5 | 1.0 | SM 5310B | 5-25-18 | 5-25-18 | |



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**DISSOLVED ORGANIC CARBON
 SM 5310B**

Matrix: Water
 Units: mg/L

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|--------------------------|-----------------------|-----|----------|---------------|---------------|-------|
| Client ID: | MONM-20180521 | | | | | |
| Laboratory ID: | 05-207-08 | | | | | |
| Dissolved Organic Carbon | 3.2 | 1.0 | SM 5310B | 5-25-18 | 5-25-18 | |
| Client ID: | SEIMN-20180521 | | | | | |
| Laboratory ID: | 05-207-09 | | | | | |
| Dissolved Organic Carbon | 3.2 | 1.0 | SM 5310B | 5-25-18 | 5-25-18 | |
| Client ID: | SEIMS-20180521 | | | | | |
| Laboratory ID: | 05-207-10 | | | | | |
| Dissolved Organic Carbon | 3.2 | 1.0 | SM 5310B | 5-25-18 | 5-25-18 | |
| Client ID: | TOSMI-20180521 | | | | | |
| Laboratory ID: | 05-207-11 | | | | | |
| Dissolved Organic Carbon | 2.5 | 1.0 | SM 5310B | 5-25-18 | 5-25-18 | |
| Client ID: | TOSMO-20180521 | | | | | |
| Laboratory ID: | 05-207-12 | | | | | |
| Dissolved Organic Carbon | 2.3 | 1.0 | SM 5310B | 5-25-18 | 5-25-18 | |
| Client ID: | TYLMI-20180521 | | | | | |
| Laboratory ID: | 05-207-13 | | | | | |
| Dissolved Organic Carbon | 2.6 | 1.0 | SM 5310B | 5-25-18 | 5-25-18 | |
| Client ID: | TYLMO-20180521 | | | | | |
| Laboratory ID: | 05-207-14 | | | | | |
| Dissolved Organic Carbon | 3.2 | 1.0 | SM 5310B | 5-25-18 | 5-25-18 | |



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Project: 14-05806-000

**DISSOLVED ORGANIC CARBON
SM 5310B**

Matrix: Water
Units: mg/L

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|--------------------------|----------------------|------------|---------------|----------------------|----------------------|--------------|
| Client ID: | QA48-20180521 | | | | | |
| Laboratory ID: | 05-207-15 | | | | | |
| Dissolved Organic Carbon | 3.0 | 1.0 | SM 5310B | 5-25-18 | 5-25-18 | |



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**DISSOLVED ORGANIC CARBON
 SM 5310B
 QUALITY CONTROL**

Matrix: Water
 Units: mg/L

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|--------------------------|-----------|-----|----------|---------------|---------------|-------|
| METHOD BLANK | | | | | | |
| Laboratory ID: | MB0525D1 | | | | | |
| Dissolved Organic Carbon | ND | 1.0 | SM 5310B | 5-25-18 | 5-25-18 | |

| Analyte | Result | Spike Level | Source Result | Percent Recovery | Recovery Limits | RPD | RPD Limit | Flags |
|--------------------------|-------------|-------------|---------------|------------------|-----------------|-----|-----------|-------|
| DUPLICATE | | | | | | | | |
| Laboratory ID: | 05-207-14 | | | | | | | |
| | ORIG | DUP | | | | | | |
| Dissolved Organic Carbon | 3.21 | 3.26 | NA | NA | NA | 1 | 15 | |

MATRIX SPIKE

| | | | | | | | | |
|--------------------------|-------------|------|------|-----|--------|----|----|--|
| Laboratory ID: | 05-207-14 | | | | | | | |
| | MS | MS | | MS | | | | |
| Dissolved Organic Carbon | 13.9 | 10.0 | 3.21 | 107 | 75-125 | NA | NA | |

SPIKE BLANK

| | | | | | | | | |
|--------------------------|-------------|------|----|-----|--------|----|----|--|
| Laboratory ID: | SB0525D1 | | | | | | | |
| | SB | SB | | SB | | | | |
| Dissolved Organic Carbon | 10.7 | 10.0 | NA | 107 | 80-120 | NA | NA | |



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TOTAL PHOSPHORUS
EPA 365.1

Matrix: Water
 Units: mg/L

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|-------------------|----------------------|-------|-----------|---------------|---------------|-------|
| Client ID: | COLM-20180521 | | | | | |
| Laboratory ID: | 05-207-01 | | | | | |
| Total Phosphorus | 0.035 | 0.010 | EPA 365.1 | 5-25-18 | 5-29-18 | |

| | | | | | | |
|-------------------|-----------------------|-------|-----------|---------|---------|--|
| Client ID: | COUMI-20180521 | | | | | |
| Laboratory ID: | 05-207-02 | | | | | |
| Total Phosphorus | 0.12 | 0.010 | EPA 365.1 | 5-25-18 | 5-29-18 | |

| | | | | | | |
|-------------------|-----------------------|-------|-----------|---------|---------|--|
| Client ID: | COUMO-20180521 | | | | | |
| Laboratory ID: | 05-207-03 | | | | | |
| Total Phosphorus | 0.076 | 0.010 | EPA 365.1 | 5-25-18 | 5-29-18 | |

| | | | | | | |
|-------------------|-----------------------|-------|-----------|---------|---------|--|
| Client ID: | EVAMS-20180521 | | | | | |
| Laboratory ID: | 05-207-04 | | | | | |
| Total Phosphorus | 0.030 | 0.010 | EPA 365.1 | 5-25-18 | 5-29-18 | |

| | | | | | | |
|-------------------|------------------------|-------|-----------|---------|---------|--|
| Client ID: | EVALSS-20180521 | | | | | |
| Laboratory ID: | 05-207-05 | | | | | |
| Total Phosphorus | 0.042 | 0.010 | EPA 365.1 | 5-25-18 | 5-29-18 | |

| | | | | | | |
|-------------------|-----------------------|-------|-----------|---------|---------|--|
| Client ID: | MONMN-20180521 | | | | | |
| Laboratory ID: | 05-207-06 | | | | | |
| Total Phosphorus | 0.050 | 0.010 | EPA 365.1 | 5-25-18 | 5-29-18 | |

| | | | | | | |
|-------------------|-----------------------|-------|-----------|---------|---------|--|
| Client ID: | MONMS-20180521 | | | | | |
| Laboratory ID: | 05-207-07 | | | | | |
| Total Phosphorus | 0.027 | 0.010 | EPA 365.1 | 5-25-18 | 5-29-18 | |



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 Project: 14-05806-000

TOTAL PHOSPHORUS
EPA 365.1

Matrix: Water
 Units: mg/L

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|-------------------|----------------------|-------|-----------|---------------|---------------|-------|
| Client ID: | MONM-20180521 | | | | | |
| Laboratory ID: | 05-207-08 | | | | | |
| Total Phosphorus | 0.042 | 0.010 | EPA 365.1 | 5-25-18 | 5-29-18 | |

| | | | | | | |
|-------------------|-----------------------|-------|-----------|---------|---------|--|
| Client ID: | SEIMN-20180521 | | | | | |
| Laboratory ID: | 05-207-09 | | | | | |
| Total Phosphorus | 0.035 | 0.010 | EPA 365.1 | 5-25-18 | 5-29-18 | |

| | | | | | | |
|-------------------|-----------------------|-------|-----------|---------|---------|--|
| Client ID: | SEIMS-20180521 | | | | | |
| Laboratory ID: | 05-207-10 | | | | | |
| Total Phosphorus | 0.044 | 0.010 | EPA 365.1 | 5-25-18 | 5-29-18 | |

| | | | | | | |
|-------------------|-----------------------|-------|-----------|---------|---------|--|
| Client ID: | TOSMI-20180521 | | | | | |
| Laboratory ID: | 05-207-11 | | | | | |
| Total Phosphorus | 0.070 | 0.010 | EPA 365.1 | 5-25-18 | 5-29-18 | |

| | | | | | | |
|-------------------|-----------------------|-------|-----------|---------|---------|--|
| Client ID: | TOSMO-20180521 | | | | | |
| Laboratory ID: | 05-207-12 | | | | | |
| Total Phosphorus | 0.070 | 0.010 | EPA 365.1 | 5-25-18 | 5-29-18 | |

| | | | | | | |
|-------------------|-----------------------|-------|-----------|---------|---------|--|
| Client ID: | TYLMI-20180521 | | | | | |
| Laboratory ID: | 05-207-13 | | | | | |
| Total Phosphorus | 0.047 | 0.010 | EPA 365.1 | 5-25-18 | 5-29-18 | |

| | | | | | | |
|-------------------|-----------------------|-------|-----------|---------|---------|--|
| Client ID: | TYLMO-20180521 | | | | | |
| Laboratory ID: | 05-207-14 | | | | | |
| Total Phosphorus | 0.056 | 0.010 | EPA 365.1 | 5-25-18 | 5-29-18 | |



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TOTAL PHOSPHORUS
EPA 365.1

Matrix: Water
Units: mg/L

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|-------------------|----------------------|------------|---------------|----------------------|----------------------|--------------|
| Client ID: | QA48-20180521 | | | | | |
| Laboratory ID: | 05-207-15 | | | | | |
| Total Phosphorus | 0.045 | 0.010 | EPA 365.1 | 5-25-18 | 5-29-18 | |



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**TOTAL PHOSPHORUS
 EPA 365.1
 QUALITY CONTROL**

Matrix: Water
 Units: mg/L

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|---------------------|-----------|-------|-----------|---------------|---------------|-------|
| METHOD BLANK | | | | | | |
| Laboratory ID: | MB0525W1 | | | | | |
| Total Phosphorus | ND | 0.010 | EPA 365.1 | 5-25-18 | 5-29-18 | |

| Analyte | Result | Spike Level | Source Result | Percent Recovery | Recovery Limits | RPD | RPD Limit | Flags |
|------------------|---------------|---------------|---------------|------------------|-----------------|-----|-----------|-------|
| DUPLICATE | | | | | | | | |
| Laboratory ID: | 05-207-01 | | | | | | | |
| | ORIG | DUP | | | | | | |
| Total Phosphorus | 0.0351 | 0.0373 | NA | NA | NA | 6 | 12 | |

| | | | | | | | | |
|---------------------|--------------|-------|--------|----|--------|----|----|--|
| MATRIX SPIKE | | | | | | | | |
| Laboratory ID: | 05-207-01 | | | | | | | |
| | MS | MS | | MS | | | | |
| Total Phosphorus | 0.275 | 0.250 | 0.0351 | 96 | 86-114 | NA | NA | |

| | | | | | | | | |
|--------------------|--------------|-------|----|----|--------|----|----|--|
| SPIKE BLANK | | | | | | | | |
| Laboratory ID: | SB0525W1 | | | | | | | |
| | SB | SB | | SB | | | | |
| Total Phosphorus | 0.243 | 0.250 | NA | 97 | 86-114 | NA | NA | |



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 Project: 14-05806-000

**TOTAL METALS
 EPA 200.8**

Matrix: Water
 Units: ug/L (ppb)

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|-------------------|----------------------|-----|-----------|---------------|---------------|-------|
| Client ID: | COLM-20180521 | | | | | |
| Laboratory ID: | 05-207-01 | | | | | |
| Copper | ND | 1.0 | EPA 200.8 | 5-25-18 | 5-25-18 | |
| Zinc | ND | 5.0 | EPA 200.8 | 5-25-18 | 5-25-18 | |

| | | | | | | |
|-------------------|-----------------------|-----|-----------|---------|---------|--|
| Client ID: | COUMI-20180521 | | | | | |
| Laboratory ID: | 05-207-02 | | | | | |
| Copper | 1.1 | 1.0 | EPA 200.8 | 5-25-18 | 5-25-18 | |
| Zinc | 6.1 | 5.0 | EPA 200.8 | 5-25-18 | 5-25-18 | |

| | | | | | | |
|-------------------|-----------------------|-----|-----------|---------|---------|--|
| Client ID: | COUMO-20180521 | | | | | |
| Laboratory ID: | 05-207-03 | | | | | |
| Copper | ND | 1.0 | EPA 200.8 | 5-25-18 | 5-25-18 | |
| Zinc | 6.1 | 5.0 | EPA 200.8 | 5-25-18 | 5-25-18 | |

| | | | | | | |
|-------------------|-----------------------|-----|-----------|---------|---------|--|
| Client ID: | EVAMS-20180521 | | | | | |
| Laboratory ID: | 05-207-04 | | | | | |
| Copper | ND | 1.0 | EPA 200.8 | 5-25-18 | 5-25-18 | |
| Zinc | ND | 5.0 | EPA 200.8 | 5-25-18 | 5-25-18 | |

| | | | | | | |
|-------------------|------------------------|-----|-----------|---------|---------|--|
| Client ID: | EVALSS-20180521 | | | | | |
| Laboratory ID: | 05-207-05 | | | | | |
| Copper | ND | 1.0 | EPA 200.8 | 5-25-18 | 5-25-18 | |
| Zinc | ND | 5.0 | EPA 200.8 | 5-25-18 | 5-25-18 | |

| | | | | | | |
|-------------------|-----------------------|-----|-----------|---------|---------|--|
| Client ID: | MONMN-20180521 | | | | | |
| Laboratory ID: | 05-207-06 | | | | | |
| Copper | ND | 1.0 | EPA 200.8 | 5-25-18 | 5-25-18 | |
| Zinc | ND | 5.0 | EPA 200.8 | 5-25-18 | 5-25-18 | |

| | | | | | | |
|-------------------|-----------------------|-----|-----------|---------|---------|--|
| Client ID: | MONMS-20180521 | | | | | |
| Laboratory ID: | 05-207-07 | | | | | |
| Copper | ND | 1.0 | EPA 200.8 | 5-25-18 | 5-25-18 | |
| Zinc | ND | 5.0 | EPA 200.8 | 5-25-18 | 5-25-18 | |



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TOTAL METALS
EPA 200.8

Matrix: Water
 Units: ug/L (ppb)

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|-------------------|----------------------|-----|-----------|---------------|---------------|-------|
| Client ID: | MONM-20180521 | | | | | |
| Laboratory ID: | 05-207-08 | | | | | |
| Copper | ND | 1.0 | EPA 200.8 | 5-25-18 | 5-25-18 | |
| Zinc | 7.1 | 5.0 | EPA 200.8 | 5-25-18 | 5-25-18 | |

| | | | | | | |
|-------------------|-----------------------|-----|-----------|---------|---------|--|
| Client ID: | SEIMN-20180521 | | | | | |
| Laboratory ID: | 05-207-09 | | | | | |
| Copper | ND | 1.0 | EPA 200.8 | 5-25-18 | 5-25-18 | |
| Zinc | ND | 5.0 | EPA 200.8 | 5-25-18 | 5-25-18 | |

| | | | | | | |
|-------------------|-----------------------|-----|-----------|---------|---------|--|
| Client ID: | SEIMS-20180521 | | | | | |
| Laboratory ID: | 05-207-10 | | | | | |
| Copper | ND | 1.0 | EPA 200.8 | 5-25-18 | 5-25-18 | |
| Zinc | ND | 5.0 | EPA 200.8 | 5-25-18 | 5-25-18 | |

| | | | | | | |
|-------------------|-----------------------|-----|-----------|---------|---------|--|
| Client ID: | TOSMI-20180521 | | | | | |
| Laboratory ID: | 05-207-11 | | | | | |
| Copper | 1.5 | 1.0 | EPA 200.8 | 5-25-18 | 5-25-18 | |
| Zinc | 27 | 5.0 | EPA 200.8 | 5-25-18 | 5-25-18 | |

| | | | | | | |
|-------------------|-----------------------|-----|-----------|---------|---------|--|
| Client ID: | TOSMO-20180521 | | | | | |
| Laboratory ID: | 05-207-12 | | | | | |
| Copper | 1.0 | 1.0 | EPA 200.8 | 5-25-18 | 5-25-18 | |
| Zinc | 11 | 5.0 | EPA 200.8 | 5-25-18 | 5-25-18 | |

| | | | | | | |
|-------------------|-----------------------|-----|-----------|---------|---------|--|
| Client ID: | TYLMI-20180521 | | | | | |
| Laboratory ID: | 05-207-13 | | | | | |
| Copper | 2.1 | 1.0 | EPA 200.8 | 5-25-18 | 5-25-18 | |
| Zinc | 8.3 | 5.0 | EPA 200.8 | 5-25-18 | 5-25-18 | |

| | | | | | | |
|-------------------|-----------------------|-----|-----------|---------|---------|--|
| Client ID: | TYLMO-20180521 | | | | | |
| Laboratory ID: | 05-207-14 | | | | | |
| Copper | 1.3 | 1.0 | EPA 200.8 | 5-25-18 | 5-25-18 | |
| Zinc | 6.3 | 5.0 | EPA 200.8 | 5-25-18 | 5-25-18 | |



Date of Report: June 13, 2018
Samples Submitted: May 21, 2018
Laboratory Reference: 1805-207
Project: 14-05806-000

TOTAL METALS
EPA 200.8

Matrix: Water
Units: ug/L (ppb)

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|-------------------|----------------------|------------|---------------|----------------------|----------------------|--------------|
| Client ID: | QA48-20180521 | | | | | |
| Laboratory ID: | 05-207-15 | | | | | |
| Copper | ND | 1.0 | EPA 200.8 | 5-25-18 | 5-25-18 | |
| Zinc | ND | 5.0 | EPA 200.8 | 5-25-18 | 5-25-18 | |



Date of Report: June 13, 2018
 Samples Submitted: May 21, 2018
 Laboratory Reference: 1805-207
 Project: 14-05806-000

**TOTAL METALS
 EPA 200.8
 QUALITY CONTROL**

Matrix: Water
 Units: ug/L (ppb)

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|---------------------|-----------|-----|-----------|---------------|---------------|-------|
| METHOD BLANK | | | | | | |
| Laboratory ID: | MB0525WH1 | | | | | |
| Copper | ND | 1.0 | EPA 200.8 | 5-25-18 | 5-25-18 | |
| Zinc | ND | 5.0 | EPA 200.8 | 5-25-18 | 5-25-18 | |

| Analyte | Result | Spike Level | Source Result | Percent Recovery | Recovery Limits | RPD | RPD Limit | Flags |
|------------------|-----------|-------------|---------------|------------------|-----------------|-----|-----------|-------|
| DUPLICATE | | | | | | | | |
| Laboratory ID: | 05-207-03 | | | | | | | |
| | ORIG | DUP | | | | | | |
| Copper | ND | ND | NA | NA | NA | NA | 20 | |
| Zinc | 6.08 | 6.00 | NA | NA | NA | 1 | 20 | |

MATRIX SPIKES

| | | | | | | | | | | |
|----------------|-----------|------|-----|-----|------|-----|-----|--------|---|----|
| Laboratory ID: | 05-207-03 | | | | | | | | | |
| | MS | MSD | MS | MSD | | MS | MSD | | | |
| Copper | 101 | 96.2 | 100 | 100 | ND | 101 | 96 | 75-125 | 5 | 20 |
| Zinc | 123 | 123 | 100 | 100 | 6.08 | 117 | 117 | 75-125 | 0 | 20 |



Date of Report: June 13, 2018
 Samples Submitted: May 21, 2018
 Laboratory Reference: 1805-207
 Project: 14-05806-000

**DISSOLVED METALS
 EPA 200.8**

Matrix: Water
 Units: ug/L (ppb)

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|-------------------|----------------------|-----|-----------|---------------|---------------|-------|
| Client ID: | COLM-20180521 | | | | | |
| Laboratory ID: | 05-207-01 | | | | | |
| Copper | ND | 1.0 | EPA 200.8 | | 5-24-18 | |
| Zinc | ND | 5.0 | EPA 200.8 | | 5-24-18 | |

| | | | | | | |
|-------------------|-----------------------|-----|-----------|--|---------|--|
| Client ID: | COUMI-20180521 | | | | | |
| Laboratory ID: | 05-207-02 | | | | | |
| Copper | ND | 1.0 | EPA 200.8 | | 5-24-18 | |
| Zinc | ND | 5.0 | EPA 200.8 | | 5-24-18 | |

| | | | | | | |
|-------------------|-----------------------|-----|-----------|--|---------|--|
| Client ID: | COUMO-20180521 | | | | | |
| Laboratory ID: | 05-207-03 | | | | | |
| Copper | ND | 1.0 | EPA 200.8 | | 5-24-18 | |
| Zinc | ND | 5.0 | EPA 200.8 | | 5-24-18 | |

| | | | | | | |
|-------------------|-----------------------|-----|-----------|--|---------|--|
| Client ID: | EVAMS-20180521 | | | | | |
| Laboratory ID: | 05-207-04 | | | | | |
| Copper | ND | 1.0 | EPA 200.8 | | 5-24-18 | |
| Zinc | ND | 5.0 | EPA 200.8 | | 5-24-18 | |

| | | | | | | |
|-------------------|------------------------|-----|-----------|--|---------|--|
| Client ID: | EVALSS-20180521 | | | | | |
| Laboratory ID: | 05-207-05 | | | | | |
| Copper | ND | 1.0 | EPA 200.8 | | 5-24-18 | |
| Zinc | ND | 5.0 | EPA 200.8 | | 5-24-18 | |

| | | | | | | |
|-------------------|-----------------------|-----|-----------|--|---------|--|
| Client ID: | MONMN-20180521 | | | | | |
| Laboratory ID: | 05-207-06 | | | | | |
| Copper | ND | 1.0 | EPA 200.8 | | 5-24-18 | |
| Zinc | ND | 5.0 | EPA 200.8 | | 5-24-18 | |

| | | | | | | |
|-------------------|-----------------------|-----|-----------|--|---------|--|
| Client ID: | MONMS-20180521 | | | | | |
| Laboratory ID: | 05-207-07 | | | | | |
| Copper | ND | 1.0 | EPA 200.8 | | 5-24-18 | |
| Zinc | ND | 5.0 | EPA 200.8 | | 5-24-18 | |



Date of Report: June 13, 2018
 Samples Submitted: May 21, 2018
 Laboratory Reference: 1805-207
 Project: 14-05806-000

**DISSOLVED METALS
 EPA 200.8**

Matrix: Water
 Units: ug/L (ppb)

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|-------------------|----------------------|-----|-----------|---------------|---------------|-------|
| Client ID: | MONM-20180521 | | | | | |
| Laboratory ID: | 05-207-08 | | | | | |
| Copper | ND | 1.0 | EPA 200.8 | | 5-24-18 | |
| Zinc | 5.4 | 5.0 | EPA 200.8 | | 5-24-18 | |

| | | | | | | |
|-------------------|-----------------------|-----|-----------|--|---------|--|
| Client ID: | SEIMN-20180521 | | | | | |
| Laboratory ID: | 05-207-09 | | | | | |
| Copper | ND | 1.0 | EPA 200.8 | | 5-24-18 | |
| Zinc | ND | 5.0 | EPA 200.8 | | 5-24-18 | |

| | | | | | | |
|-------------------|-----------------------|-----|-----------|--|---------|--|
| Client ID: | SEIMS-20180521 | | | | | |
| Laboratory ID: | 05-207-10 | | | | | |
| Copper | ND | 1.0 | EPA 200.8 | | 5-24-18 | |
| Zinc | ND | 5.0 | EPA 200.8 | | 5-24-18 | |

| | | | | | | |
|-------------------|-----------------------|-----|-----------|--|---------|--|
| Client ID: | TOSMI-20180521 | | | | | |
| Laboratory ID: | 05-207-11 | | | | | |
| Copper | 1.2 | 1.0 | EPA 200.8 | | 5-24-18 | |
| Zinc | 20 | 5.0 | EPA 200.8 | | 5-24-18 | |

| | | | | | | |
|-------------------|-----------------------|-----|-----------|--|---------|--|
| Client ID: | TOSMO-20180521 | | | | | |
| Laboratory ID: | 05-207-12 | | | | | |
| Copper | ND | 1.0 | EPA 200.8 | | 5-24-18 | |
| Zinc | 7.3 | 5.0 | EPA 200.8 | | 5-24-18 | |

| | | | | | | |
|-------------------|-----------------------|-----|-----------|--|---------|--|
| Client ID: | TYLMI-20180521 | | | | | |
| Laboratory ID: | 05-207-13 | | | | | |
| Copper | 1.4 | 1.0 | EPA 200.8 | | 5-24-18 | |
| Zinc | ND | 5.0 | EPA 200.8 | | 5-24-18 | |

| | | | | | | |
|-------------------|-----------------------|-----|-----------|--|---------|--|
| Client ID: | TYLMO-20180521 | | | | | |
| Laboratory ID: | 05-207-14 | | | | | |
| Copper | 1.1 | 1.0 | EPA 200.8 | | 5-24-18 | |
| Zinc | 6.8 | 5.0 | EPA 200.8 | | 5-24-18 | |



Date of Report: June 13, 2018
Samples Submitted: May 21, 2018
Laboratory Reference: 1805-207
Project: 14-05806-000

DISSOLVED METALS
EPA 200.8

Matrix: Water
Units: ug/L (ppb)

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|-------------------|----------------------|------------|---------------|----------------------|----------------------|--------------|
| Client ID: | QA48-20180521 | | | | | |
| Laboratory ID: | 05-207-15 | | | | | |
| Copper | ND | 1.0 | EPA 200.8 | | 5-24-18 | |
| Zinc | ND | 5.0 | EPA 200.8 | | 5-24-18 | |



Date of Report: June 13, 2018
 Samples Submitted: May 21, 2018
 Laboratory Reference: 1805-207
 Project: 14-05806-000

**DISSOLVED METALS
 EPA 200.8
 QUALITY CONTROL**

Matrix: Water
 Units: ug/L (ppb)

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|---------------------|-----------|-----|-----------|---------------|---------------|-------|
| METHOD BLANK | | | | | | |
| Laboratory ID: | MB0524D1 | | | | | |
| Copper | ND | 1.0 | EPA 200.8 | | 5-24-18 | |
| Zinc | ND | 5.0 | EPA 200.8 | | 5-24-18 | |

| Analyte | Result | Spike Level | Source Result | Percent Recovery | Recovery Limits | RPD | RPD Limit | Flags |
|------------------|-----------|-------------|---------------|------------------|-----------------|-----|-----------|-------|
| DUPLICATE | | | | | | | | |
| Laboratory ID: | 05-207-15 | | | | | | | |
| | ORIG | DUP | | | | | | |
| Copper | ND | ND | NA | NA | NA | NA | 20 | |
| Zinc | ND | ND | NA | NA | NA | NA | 20 | |

MATRIX SPIKES

| | | | | | | | | | | |
|----------------|-------------|-------------|------|------|----|------------|------------|--------|---|----|
| Laboratory ID: | 05-207-15 | | | | | | | | | |
| | MS | MSD | MS | MSD | | MS | MSD | | | |
| Copper | 77.2 | 75.8 | 80.0 | 80.0 | ND | 97 | 95 | 75-125 | 2 | 20 |
| Zinc | 85.2 | 84.6 | 80.0 | 80.0 | ND | 107 | 106 | 75-125 | 1 | 20 |





Data Qualifiers and Abbreviations

- A - Due to a high sample concentration, the amount spiked is insufficient for meaningful MS/MSD recovery data.
 - B - The analyte indicated was also found in the blank sample.
 - C - The duplicate RPD is outside control limits due to high result variability when analyte concentrations are within five times the quantitation limit.
 - E - The value reported exceeds the quantitation range and is an estimate.
 - F - Surrogate recovery data is not available due to the high concentration of coeluting target compounds.
 - H - The analyte indicated is a common laboratory solvent and may have been introduced during sample preparation, and be impacting the sample result.
 - I - Compound recovery is outside of the control limits.
 - J - The value reported was below the practical quantitation limit. The value is an estimate.
 - K - Sample duplicate RPD is outside control limits due to sample inhomogeneity. The sample was re-extracted and re-analyzed with similar results.
 - L - The RPD is outside of the control limits.
 - M - Hydrocarbons in the gasoline range are impacting the diesel range result.
 - M1 - Hydrocarbons in the gasoline range (toluene-naphthalene) are present in the sample.
 - N - Hydrocarbons in the lube oil range are impacting the diesel range result.
 - N1 - Hydrocarbons in diesel range are impacting lube oil range results.
 - O - Hydrocarbons indicative of heavier fuels are present in the sample and are impacting the gasoline result.
 - P - The RPD of the detected concentrations between the two columns is greater than 40.
 - Q - Surrogate recovery is outside of the control limits.
 - S - Surrogate recovery data is not available due to the necessary dilution of the sample.
 - T - The sample chromatogram is not similar to a typical _____.
 - U - The analyte was analyzed for, but was not detected above the reported sample quantitation limit.
 - U1 - The practical quantitation limit is elevated due to interferences present in the sample.
 - V - Matrix Spike/Matrix Spike Duplicate recoveries are outside control limits due to matrix effects.
 - W - Matrix Spike/Matrix Spike Duplicate RPD are outside control limits due to matrix effects.
 - X - Sample extract treated with a mercury cleanup procedure.
 - X1 - Sample extract treated with a sulfuric acid/silica gel cleanup procedure.
 - Y - The calibration verification for this analyte exceeded the 20% drift specified in method 8260C, and therefore the reported result should be considered an estimate. The overall performance of the calibration verification standard met the acceptance criteria of the method.
 - Z -
- ND - Not Detected at PQL
 PQL - Practical Quantitation Limit
 RPD - Relative Percent Difference





Am Test Inc.
13600 NE 126TH PL
Suite C
Kirkland, WA 98034
(425) 885-1664

**Professional
Analytical
Services**

Jun 13 2018
On-Site Environmental
14648 NE 95th ST
Redmond, WA 98052
Attention: David Baumeister

Dear David Baumeister:

Enclosed please find the analytical data for your REDMOND PAIRED WATERSHED STUDY project.

The following is a cross correlation of client and laboratory identifications for your convenience.

| CLIENT ID | MATRIX | AMTEST ID | TEST |
|-----------------|--------|------------|------------|
| COLM-20180521 | Water | 18-A008734 | Micro, NUT |
| COUMI-20180521 | Water | 18-A008735 | Micro, NUT |
| COUMO-20180521 | Water | 18-A008736 | Micro, NUT |
| EVAMS-20180521 | Water | 18-A008737 | Micro, NUT |
| EVALSS-20180521 | Water | 18-A008738 | Micro, NUT |
| MONMN-20180521 | Water | 18-A008739 | Micro, NUT |
| MONMS-20180521 | Water | 18-A008740 | Micro, NUT |
| MONM-20180521 | Water | 18-A008741 | Micro, NUT |
| SEIMN-20180521 | Water | 18-A008742 | Micro, NUT |
| SEIMS-20180521 | Water | 18-A008743 | Micro, NUT |
| TOSMI-20180521 | Water | 18-A008744 | Micro, NUT |
| TOSMO-20180521 | Water | 18-A008745 | Micro, NUT |
| TYLMI-20180521 | Water | 18-A008746 | Micro, NUT |
| TYLMO-20180521 | Water | 18-A008747 | Micro, NUT |
| QA48-20180521 | Water | 18-A008748 | Micro, NUT |

Your samples were received on Tuesday, May 22, 2018. At the time of receipt, the samples were logged in and properly maintained prior to the subsequent analysis.

The analytical procedures used at AmTest are well documented and are typically derived from the protocols of the EPA, USDA, FDA or the Army Corps of Engineers.

Following the analytical data you will find the Quality Control (QC) results.

Please note that the detection limits that are listed in the body of the report refer to the Practical Quantitation Limits (PQL's), as opposed to the Method Detection Limits (MDL's).

Am Test Inc.
13600 NE 126TH PL
Suite C
Kirkland, WA 98034
(425) 885-1664

**Professional
Analytical
Services**

Jun 13 2018
On-Site Environmental
continued . . .

If you should have any questions pertaining to the data package, please feel free to contact me.

Sincerely,


Aaron W. Young
Laboratory Manager

Project #: 14-05806-000
PO Number: 05-207

BACT = Bacteriological
CONV = Conventionals

MET = Metals
ORG = Organics

NUT=Nutrients
DEM=Demand

MIN=Minerals

Am Test Inc.
13600 NE 126TH PL
Suite C
Kirkland, WA 98034
(425) 885-1664
www.amtestlab.com



Professional
Analytical
Services

ANALYSIS REPORT

On-Site Environmental
14648 NE 95th ST
Redmond, WA 98052
Attention: David Baumeister
Project Name: REDMOND PAIRED WATERSHED STUDY
Project #: 14-05806-000
PO Number: 05-207
All results reported on an as received basis.

Date Received: 05/22/18
Date Reported: 6/13/18

AMTEST Identification Number 18-A008734
Client Identification COLM-20180521
Sampling Date 05/21/18, 11:20

Results

| PARAMETER | RESULT | UNITS | Q | D.L. | METHOD | ANALYST | DATE |
|--------------------------|--------|------------|---|------|-----------|---------|----------|
| Fecal Coliform | 50. | CFU/100 ml | | 1 | SM 9222D | JM | 05/22/18 |
| Total Nitrogen (NOX&TKN) | 0.17 | mg/l | | 0.1 | | | |
| Total Nitrogen (TKN) | 0.128 | mg/l | | 0.1 | SM4500N | JC | 06/08/18 |
| Total Nitrate + Nitrite | 0.038 | mg/l | | 0.01 | SM4500NO3 | JC | 06/05/18 |

On-Site Environmental
Project Name: REDMOND PAIRED WATERSHED STUDY
AmTest ID: 18-A008735

AMTEST Identification Number **18-A008735**
Client Identification **COUMI-20180521**
Sampling Date **05/21/18, 15:40**

Results

| PARAMETER | RESULT | UNITS | Q | D.L. | METHOD | ANALYST | DATE |
|--------------------------|--------|------------|---|------|-----------|---------|----------|
| Fecal Coliform | 15. | CFU/100 ml | | 1 | SM 9222D | JM | 05/22/18 |
| Total Nitrogen (NOX&TKN) | 0.35 | mg/l | | 0.1 | | | |
| Total Nitrogen (TKN) | < 0.1 | mg/l | | 0.1 | SM4500N | JC | 06/08/18 |
| Total Nitrate + Nitrite | 0.35 | mg/l | | 0.01 | SM4500NO3 | JC | 06/05/18 |

AMTEST Identification Number **18-A008736**
Client Identification **COUMO-20180521**
Sampling Date **05/21/18, 15:25**

Results

| PARAMETER | RESULT | UNITS | Q | D.L. | METHOD | ANALYST | DATE |
|--------------------------|--------|------------|---|------|-----------|---------|----------|
| Fecal Coliform | 890 | CFU/100 ml | | 1 | SM 9222D | JM | 05/22/18 |
| Total Nitrogen (NOX&TKN) | 0.40 | mg/l | | 0.1 | | | |
| Total Nitrogen (TKN) | < 0.1 | mg/l | | 0.1 | SM4500N | JC | 06/08/18 |
| Total Nitrate + Nitrite | 0.40 | mg/l | | 0.01 | SM4500NO3 | JC | 06/05/18 |

On-Site Environmental
Project Name: REDMOND PAIRED WATERSHED STUDY
AmTest ID: 18-A008737

AMTEST Identification Number **18-A008737**
Client Identification **EVAMS-20180521**
Sampling Date **05/21/18, 14:25**

Results

| PARAMETER | RESULT | UNITS | Q | D.L. | METHOD | ANALYST | DATE |
|--------------------------|--------|------------|---|------|-----------|---------|----------|
| Fecal Coliform | 220 | CFU/100 ml | | 1 | SM 9222D | JM | 05/22/18 |
| Total Nitrogen (NOX&TKN) | 2.36 | mg/l | | 0.1 | | | |
| Total Nitrogen (TKN) | 0.563 | mg/l | | 0.1 | SM4500N | JC | 06/08/18 |
| Total Nitrate + Nitrite | 1.8 | mg/l | | 0.01 | SM4500NO3 | JC | 06/05/18 |

AMTEST Identification Number **18-A008738**
Client Identification **EVALSS-20180521**
Sampling Date **05/21/18, 14:40**

Results

| PARAMETER | RESULT | UNITS | Q | D.L. | METHOD | ANALYST | DATE |
|--------------------------|--------|------------|---|------|-----------|---------|----------|
| Fecal Coliform | 20. | CFU/100 ml | | 1 | SM 9222D | JM | 05/22/18 |
| Total Nitrogen (NOX&TKN) | 1.40 | mg/l | | 0.1 | | | |
| Total Nitrogen (TKN) | < 0.1 | mg/l | | 0.1 | SM4500N | JC | 06/08/18 |
| Total Nitrate + Nitrite | 1.4 | mg/l | | 0.01 | SM4500NO3 | JC | 06/05/18 |

On-Site Environmental
Project Name: REDMOND PAIRED WATERSHED STUDY
AmTest ID: 18-A008739

AMTEST Identification Number **18-A008739**
Client Identification **MONMN-20180521**
Sampling Date **05/21/18, 13:10**

Results

| PARAMETER | RESULT | UNITS | Q | D.L. | METHOD | ANALYST | DATE |
|--------------------------|--------|------------|---|------|-----------|---------|----------|
| Fecal Coliform | 60. | CFU/100 ml | | 1 | SM 9222D | JM | 05/22/18 |
| Total Nitrogen (NOX&TKN) | 0.31 | mg/l | | 0.1 | | | |
| Total Nitrogen (TKN) | < 0.1 | mg/l | | 0.1 | SM4500N | JC | 06/08/18 |
| Total Nitrate + Nitrite | 0.31 | mg/l | | 0.01 | SM4500NO3 | JC | 06/05/18 |

AMTEST Identification Number **18-A008740**
Client Identification **MONMS-20180521**
Sampling Date **05/21/18, 13:25**

Results

| PARAMETER | RESULT | UNITS | Q | D.L. | METHOD | ANALYST | DATE |
|--------------------------|--------|------------|---|------|-----------|---------|----------|
| Fecal Coliform | < 5 | CFU/100 ml | | 1 | SM 9222D | JM | 05/22/18 |
| Total Nitrogen (NOX&TKN) | 0.27 | mg/l | | 0.1 | | | |
| Total Nitrogen (TKN) | < 0.1 | mg/l | | 0.1 | SM4500N | JC | 06/08/18 |
| Total Nitrate + Nitrite | 0.27 | mg/l | | 0.01 | SM4500NO3 | JC | 06/05/18 |

On-Site Environmental
Project Name: REDMOND PAIRED WATERSHED STUDY
AmTest ID: 18-A008741

AMTEST Identification Number **18-A008741**
Client Identification **MONM-20180521**
Sampling Date **05/21/18, 12:10**

Results

| PARAMETER | RESULT | UNITS | Q | D.L. | METHOD | ANALYST | DATE |
|--------------------------|--------|------------|---|------|-----------|---------|----------|
| Fecal Coliform | 280 | CFU/100 ml | | 1 | SM 9222D | JM | 05/22/18 |
| Total Nitrogen (NOX&TKN) | 0.32 | mg/l | | 0.1 | | | |
| Total Nitrogen (TKN) | < 0.1 | mg/l | | 0.1 | SM4500N | JC | 06/08/18 |
| Total Nitrate + Nitrite | 0.32 | mg/l | | 0.01 | SM4500NO3 | JC | 06/05/18 |

AMTEST Identification Number **18-A008742**
Client Identification **SEIMN-20180521**
Sampling Date **05/21/18, 10:40**

Results

| PARAMETER | RESULT | UNITS | Q | D.L. | METHOD | ANALYST | DATE |
|--------------------------|--------|------------|---|------|-----------|---------|----------|
| Fecal Coliform | 5. | CFU/100 ml | | 1 | SM 9222D | JM | 05/22/18 |
| Total Nitrogen (NOX&TKN) | 0.46 | mg/l | | 0.1 | | | |
| Total Nitrogen (TKN) | 0.228 | mg/l | | 0.1 | SM4500N | JC | 06/08/18 |
| Total Nitrate + Nitrite | 0.23 | mg/l | | 0.01 | SM4500NO3 | JC | 06/05/18 |

On-Site Environmental
Project Name: REDMOND PAIRED WATERSHED STUDY
AmTest ID: 18-A008743

AMTEST Identification Number **18-A008743**
Client Identification **SEIMS-20180521**
Sampling Date **05/21/18, 12:40**

Results

| PARAMETER | RESULT | UNITS | Q | D.L. | METHOD | ANALYST | DATE |
|--------------------------|--------|------------|---|------|-----------|---------|----------|
| Fecal Coliform | 5. | CFU/100 ml | | 1 | SM 9222D | JM | 05/22/18 |
| Total Nitrogen (NOX&TKN) | 0.24 | mg/l | | 0.1 | | | |
| Total Nitrogen (TKN) | < 0.1 | mg/l | | 0.1 | SM4500N | JC | 06/08/18 |
| Total Nitrate + Nitrite | 0.24 | mg/l | | 0.01 | SM4500NO3 | JC | 06/05/18 |

AMTEST Identification Number **18-A008744**
Client Identification **TOSMI-20180521**
Sampling Date **05/21/18, 16:15**

Results

| PARAMETER | RESULT | UNITS | Q | D.L. | METHOD | ANALYST | DATE |
|--------------------------|--------|------------|---|------|-----------|---------|----------|
| Fecal Coliform | 45. | CFU/100 ml | | 1 | SM 9222D | JM | 05/22/18 |
| Total Nitrogen (NOX&TKN) | 0.82 | mg/l | | 0.1 | | | |
| Total Nitrogen (TKN) | < 0.1 | mg/l | | 0.1 | SM4500N | JC | 06/08/18 |
| Total Nitrate + Nitrite | 0.82 | mg/l | | 0.01 | SM4500NO3 | JC | 06/05/18 |

On-Site Environmental
Project Name: REDMOND PAIRED WATERSHED STUDY
AmTest ID: 18-A008745

AMTEST Identification Number **18-A008745**
Client Identification **TOSMO-20180521**
Sampling Date **05/21/18, 15:55**

Results

| PARAMETER | RESULT | UNITS | Q | D.L. | METHOD | ANALYST | DATE |
|--------------------------|--------|------------|---|------|-----------|---------|----------|
| Fecal Coliform | 90. | CFU/100 ml | | 1 | SM 9222D | JM | 05/22/18 |
| Total Nitrogen (NOX&TKN) | 0.57 | mg/l | | 0.1 | | | |
| Total Nitrogen (TKN) | < 0.1 | mg/l | | 0.1 | SM4500N | JC | 06/08/18 |
| Total Nitrate + Nitrite | 0.57 | mg/l | | 0.01 | SM4500NO3 | JC | 06/05/18 |

AMTEST Identification Number **18-A008746**
Client Identification **TYLMI-20180521**
Sampling Date **05/21/18, 14:00**

Results

| PARAMETER | RESULT | UNITS | Q | D.L. | METHOD | ANALYST | DATE |
|--------------------------|--------|------------|---|------|-----------|---------|----------|
| Fecal Coliform | 10. | CFU/100 ml | | 1 | SM 9222D | JM | 05/22/18 |
| Total Nitrogen (NOX&TKN) | 1.39 | mg/l | | 0.1 | | | |
| Total Nitrogen (TKN) | 0.287 | mg/l | | 0.1 | SM4500N | JC | 06/08/18 |
| Total Nitrate + Nitrite | 1.1 | mg/l | | 0.01 | SM4500NO3 | JC | 06/05/18 |

AMTEST Identification Number **18-A008747**
Client Identification **TYLMO-20180521**
Sampling Date **05/21/18, 13:45**


Results

| PARAMETER | RESULT | UNITS | Q | D.L. | METHOD | ANALYST | DATE |
|--------------------------|--------|------------|---|------|-----------|---------|----------|
| Fecal Coliform | 420 | CFU/100 ml | | 1 | SM 9222D | JM | 05/22/18 |
| Total Nitrogen (NOX&TKN) | 0.38 | mg/l | | 0.1 | | | |
| Total Nitrogen (TKN) | < 0.1 | mg/l | | 0.1 | SM4500N | JC | 06/08/18 |
| Total Nitrate + Nitrite | 0.38 | mg/l | | 0.01 | SM4500NO3 | JC | 06/05/18 |

AMTEST Identification Number **18-A008748**
Client Identification **QA48-20180521**
Sampling Date **05/21/18, 12:50**

Results

| PARAMETER | RESULT | UNITS | Q | D.L. | METHOD | ANALYST | DATE |
|--------------------------|--------|------------|---|------|-----------|---------|----------|
| Fecal Coliform | 15. | CFU/100 ml | | 1 | SM 9222D | JM | 05/22/18 |
| Total Nitrogen (NOX&TKN) | 0.25 | mg/l | | 0.1 | | | |
| Total Nitrogen (TKN) | < 0.1 | mg/l | | 0.1 | SM4500N | JC | 06/08/18 |
| Total Nitrate + Nitrite | 0.25 | mg/l | | 0.01 | SM4500NO3 | JC | 06/05/18 |


Aaron W. Young
Laboratory Manager

QC Summary for sample numbers: 18-A008734 to 18-A008748

DUPLICATES

| SAMPLE # | ANALYTE | UNITS | SAMPLE VALUE | DUP VALUE | RPD |
|------------|-------------------------|------------|--------------|-----------|------|
| 18-A008734 | Fecal Coliform | CFU/100 ml | 50. | 50. | 0.00 |
| 18-A008748 | Fecal Coliform | CFU/100 ml | 15. | < 5 | |
| 18-A008739 | Total Nitrogen (TKN) | mg/l | < 0.1 | < 0.1 | |
| 18-A008742 | Total Nitrogen (TKN) | mg/l | 0.228 | < 0.1 | |
| 18-A009067 | Total Nitrogen (TKN) | mg/l | < 0.1 | < 0.1 | |
| 18-A008742 | Total Nitrate + Nitrite | mg/l | 0.23 | 0.22 | 4.4 |
| 18-A008775 | Total Nitrate + Nitrite | mg/l | 0.44 | 0.45 | 2.2 |
| 18-A008861 | Total Nitrate + Nitrite | mg/l | < 0.01 | 0.000 | |
| 18-A008939 | Total Nitrate + Nitrite | mg/l | 1.8 | 1.8 | 0.00 |
| 18-A009161 | Total Nitrate + Nitrite | mg/l | 0.054 | 0.049 | 9.7 |

MATRIX SPIKES

| SAMPLE # | ANALYTE | UNITS | SAMPLE VALUE | SMPL+ SPK | SPK AMT | RECOVERY |
|------------|-------------------------|-------|--------------|-----------|---------|----------|
| 18-A008739 | Total Nitrogen (TKN) | mg/l | < 0.1 | 1.02 | 1.00 | 102.00 % |
| 18-A008742 | Total Nitrogen (TKN) | mg/l | 0.228 | 1.32 | 1.00 | 109.20 % |
| 18-A009067 | Total Nitrogen (TKN) | mg/l | < 0.1 | 0.968 | 1.00 | 96.80 % |
| 18-A008742 | Total Nitrate + Nitrite | mg/l | 0.23 | 1.3 | 1.0 | 107.00 % |
| 18-A008775 | Total Nitrate + Nitrite | mg/l | 0.44 | 1.5 | 1.0 | 106.00 % |
| 18-A008861 | Total Nitrate + Nitrite | mg/l | < 0.01 | 1.0 | 1.0 | 100.00 % |
| 18-A008939 | Total Nitrate + Nitrite | mg/l | 1.8 | 2.9 | 1.0 | 110.00 % |
| 18-A009161 | Total Nitrate + Nitrite | mg/l | 0.054 | 1.1 | 1.0 | 104.60 % |

STANDARD REFERENCE MATERIALS

| ANALYTE | UNITS | TRUE VALUE | MEASURED VALUE | RECOVERY |
|-------------------------|-------|------------|----------------|----------|
| Total Nitrogen (TKN) | mg/l | 1.00 | 1.03 | 103. % |
| Total Nitrogen (TKN) | mg/l | 1.00 | 0.996 | 99.6 % |
| Total Nitrate + Nitrite | mg/l | 1.0 | 0.97 | 97.0 % |
| Total Nitrate + Nitrite | mg/l | 1.0 | 0.95 | 95.0 % |
| Total Nitrate + Nitrite | mg/l | 1.0 | 0.99 | 99.0 % |
| Total Nitrate + Nitrite | mg/l | 1.0 | 0.97 | 97.0 % |
| Total Nitrate + Nitrite | mg/l | 1.0 | 0.95 | 95.0 % |

BLANKS

| ANALYTE | UNITS | RESULT |
|----------------------|------------|--------|
| Fecal Coliform | CFU/100 ml | < 1 |
| Fecal Coliform | CFU/100 ml | < 1 |
| Total Nitrogen (TKN) | mg/l | < 0.1 |
| Total Nitrogen (TKN) | mg/l | < 0.1 |

QC Summary for sample numbers: 18-A008734 to 18-A008748...

BLANKS continued....

| ANALYTE | UNITS | RESULT |
|-------------------------|-------|--------|
| Total Nitrate + Nitrite | mg/l | < 0.01 |
| Total Nitrate + Nitrite | mg/l | < 0.01 |
| Total Nitrate + Nitrite | mg/l | < 0.01 |
| Total Nitrate + Nitrite | mg/l | < 0.01 |
| Total Nitrate + Nitrite | mg/l | < 0.01 |



14648 NE 95th Street, Redmond, WA 98052 · (425) 383-3881

Laboratory: AmTest Laboratories

Attention: Aaron Young

13600 NE 126th PI Kirkland, WA 98034

Phone Number: (425) 885-1664

Turnaround Request

1 Day 2 Day 3 Day

Standard

Other: _____

Laboratory Reference #: 05-207

Project Manager: Blair Goodrow

email: bgoodrow@onsite-env.com

Project Number: 14-05806-000

Project Name: Redmond Paired Watershed Study

| Lab ID | Sample Identification | Date Sampled | Time Sampled | Matrix | # of Cont. | Requested Analyses |
|------------------|-----------------------|-----------------|--------------|---------|------------|--|
| 1 | COLM-20180521 8734 | 5/21/18 | 1120 | Water | 2 | Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N |
| 2 | COUMI-20180521 35 | 5/21/18 | 1540 | Water | 2 | Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N |
| 3 | COUMO-20180521 36 | 5/21/18 | 1525 | Water | 2 | Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N |
| 4 | EVAMS-20180521 37 | 5/21/18 | 1425 | Water | 2 | Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N |
| 5 | EVALSS-20180521 38 | 5/21/18 | 1440 | Water | 2 | Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N |
| 6 | MONMN-20180521 39 | 5/21/18 | 1310 | Water | 2 | Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N |
| 7 | MONMS-20180521 40 | 5/21/18 | 1325 | Water | 2 | Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N |
| 8 | MONM-20180521 41 | 5/21/18 | 1210 | Water | 2 | Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N |
| 9 | SEIMN-20180521 42 | 5/21/18 | 1040 | Water | 2 | Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N |
| 10 | SEIMS-20180521 43 | 5/21/18 | 1240 | Water | 2 | Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N |
| Signature | | Company | | Date | Time | Comments/Special Instructions |
| Relinquished by: | | OSE | | 5/22/18 | 8:31 | EDDs - CSV Reporting Limits: Fecal Coliform - 1.0 cfu/100ml Total Nitrogen - .10 mg/L |
| Received by: | | AMTEST T=2.2 | | 5/22/18 | 8:30 | |
| Relinquished by: | | | | | | |
| Received by: | | | | | | |
| Relinquished by: | | | | | | |
| Received by: | | | | | | |



14648 NE 95th Street, Redmond, WA 98052
Telephone: 425.883.3881

Company: Herrera Environmental Consultants

Project No.: 14-05806-000

Project Name: Redmond Paired Watershed Study

Project Manager: George Iftner

CHAIN OF CUSTODY

Turnaround Requested:

- 1 Day
- 2 Day
- 3 Day
- Standard

Laboratory No.

05-207

Requested Analyses

| Total Suspended Solids (SM 2540D) | Turbidity (EPA 181.1) | Hardness (EPA 200.7 / SM 2340B) | Dissolved Organ Carbon (SM 5310B) * | Fecal Coliform (SM 9222D) | Total Phosphorus (EPA 365.1) | Total Nitrogen (SM 4500 N-B) | Total Cu and Zn (EPA 200.8) | Dissolved Cu and Zn (EPA 200.8) * |
|-----------------------------------|-----------------------|---------------------------------|-------------------------------------|---------------------------|------------------------------|------------------------------|-----------------------------|-----------------------------------|
|-----------------------------------|-----------------------|---------------------------------|-------------------------------------|---------------------------|------------------------------|------------------------------|-----------------------------|-----------------------------------|

| Lab ID | Sample Identification | Date Sampled | Time Sampled | Matrix | # of Cont. | Total Suspended Solids (SM 2540D) | Turbidity (EPA 181.1) | Hardness (EPA 200.7 / SM 2340B) | Dissolved Organ Carbon (SM 5310B) * | Fecal Coliform (SM 9222D) | Total Phosphorus (EPA 365.1) | Total Nitrogen (SM 4500 N-B) | Total Cu and Zn (EPA 200.8) | Dissolved Cu and Zn (EPA 200.8) * |
|--------|-----------------------|--------------|--------------|--------|------------|-----------------------------------|-----------------------|---------------------------------|-------------------------------------|---------------------------|------------------------------|------------------------------|-----------------------------|-----------------------------------|
| 1 | COLM-2018 0521 | 5-21-18 | 1120 | Water | 7 | X | X | X | X | X | X | X | X | X |
| 2 | COUMI-2018 0521 | | 1540 | Water | 7 | X | X | X | X | X | X | X | X | X |
| 3 | COUMO-2018 0521 | | 1525 | Water | 7 | X | X | X | X | X | X | X | X | X |
| 4 | EVAMS-2018 0521 | | 1425 | Water | 7 | X | X | X | X | X | X | X | X | X |
| 5 | EVALSS-2018 0521 | | 1440 | Water | 7 | X | X | X | X | X | X | X | X | X |
| 6 | MONMN-2018 0521 | | 1310 | Water | 7 | X | X | X | X | X | X | X | X | X |
| 7 | MONMS-2018 0521 | | 1325 | Water | 7 | X | X | X | X | X | X | X | X | X |
| 8 | MONM-2018 0521 | | 1210 | Water | 7 | X | X | X | X | X | X | X | X | X |
| 9 | SEIMN-2018 0521 | | 1040 | Water | 7 | X | X | X | X | X | X | X | X | X |
| 10 | SEIMS-2018 0521 | | 1240 | Water | 7 | X | X | X | X | X | X | X | X | X |
| 11 | TOSMI-2018 0521 | | 1615 | Water | 7 | X | X | X | X | X | X | X | X | X |
| 12 | TOSMO-2018 0521 | | 1555 | Water | 7 | X | X | X | X | X | X | X | X | X |
| 13 | TYLMI-2018 0521 | | 1400 | Water | 7 | X | X | X | X | X | X | X | X | X |
| 14 | TYLMO-2018 0521 | | 1345 | Water | 7 | X | X | X | X | X | X | X | X | X |
| 15 | QA 48-2018 0521 | | 1250 | Water | 7 | X | X | X | X | X | X | X | X | X |

Relinquished by Miriam Turner Date 5/21/18 Received by Walter Lee Date 5/21/18
 Firm Herrera Time 1635 Firm OSE Time 1635
 Relinquished by _____ Date _____ Received by _____ Date _____
 Firm _____ Time _____ Firm _____ Time _____

Comments:
 * - field filtered with 0.45 µm filter within 15 minutes of collecting sample



NE 95th Street, Redmond, WA 98052
Phone: 425.883.3881

Company: Herrera Environmental Consultants
Contract No.: 14-05806-000
Contract Name: Redmond Paired Watershed Study
Contract Manager: George Iftner

CHAIN OF CUSTODY

Turnaround Requested:
 1 Day
 2 Day
 3 Day
 Standard

Laboratory No.

05-207

Requested Analyses

| Sample Identification | Date Sampled | Time Sampled | Matrix | # of Cont. | Total Suspended Solids (SM 2540D) | Turbidity (EPA 181.1) | Hardness (EPA 200.7 / SM 2340B) | Dissolved Organ Carbon (SM 5310B) * | Fecal Coliform (SM 9222D) | Total Phosphorus (EPA 365.1) | Total Nitrogen (SM 4500 N-B) | Total Cu and Zn (EPA 200.8) | Dissolved Cu and Zn (EPA 200.8) * |
|-----------------------|--------------|--------------|--------|------------|-----------------------------------|-----------------------|---------------------------------|-------------------------------------|---------------------------|------------------------------|------------------------------|-----------------------------|-----------------------------------|
| COLM-2018 0521 | 5-21-18 | 1120 | Water | 7 | X | X | X | X | X | X | X | X | X |
| COUMI-2018 0521 | | 1540 | Water | 7 | X | X | X | X | X | X | X | X | X |
| COUMO-2018 0521 | | 1525 | Water | 7 | X | X | X | X | X | X | X | X | X |
| EVAMS-2018 0521 | | 1425 | Water | 7 | X | X | X | X | X | X | X | X | X |
| EVALSS-2018 0521 | | 1440 | Water | 7 | X | X | X | X | X | X | X | X | X |
| MONMN-2018 0521 | | 1310 | Water | 7 | X | X | X | X | X | X | X | X | X |
| MONMS-2018 0521 | | 1325 | Water | 7 | X | X | X | X | X | X | X | X | X |
| MONM-2018 0521 | | 1210 | Water | 7 | X | X | X | X | X | X | X | X | X |
| SEIMN-2018 0521 | | 1040 | Water | 7 | X | X | X | X | X | X | X | X | X |
| SEIMS-2018 0521 | | 1240 | Water | 7 | X | X | X | X | X | X | X | X | X |
| TOSMI-2018 0521 | | 1615 | Water | 7 | X | X | X | X | X | X | X | X | X |
| TOSMO-2018 0521 | | 1555 | Water | 7 | X | X | X | X | X | X | X | X | X |
| TYLMI-2018 0521 | | 1400 | Water | 7 | X | X | X | X | X | X | X | X | X |
| TYLMO-2018 0521 | | 1345 | Water | 7 | X | X | X | X | X | X | X | X | X |
| QA 48-2018 0521 | | 1250 | Water | 7 | X | X | X | X | X | X | X | X | X |

Requested by: Maria Herrera Date: 5/21/18 Received by: Walter Lee Date: 5/21/18
 Name: Herrera Time: 11035 Firm: OSE Time: 1635
 Requested by: _____ Date: _____ Received by: _____ Date: _____
 Name: _____ Time: _____ Firm: _____ Time: _____

Comments:
 * - field filtered with 0.45 µm filter within 15 minutes of collecting sample

METER CALIBRATION LOG - Redmond Paired Watershed Study

| | | | |
|-----------------------------------|---------------|------------|--|
| Project Number: | 14-05806-000 | | |
| Personnel Performing Calibration: | ALEX SVENDSEN | | |
| Meter: | YSI PRODSS #2 | | |
| Date/Time: | 5/21/18 0920 | | |
| Barometric Pressure Start of Day: | mmHg: 760.9 | Time: 0927 | |
| Barometric Pressure End of Day: | mmHg: 756.6 | Time: 1327 | |

| |
|---|
| Calibration Procedures: |
| Rinse Multimeter Sonde Between Each Operation |
| Rinse 3 times with tap water, 3 times with deionized water, then 3 times with the solution to be used for calibrating or testing. |
| Conductivity Calibration Notes: |



| PRE Field Run CALIBRATION | Meter Reading | Buffer / Cal Std | Temp °C | Comments |
|---------------------------|---------------|------------------|---------|--------------------------|
| Conductivity (µS/cm) | 11.8 | 0 | 23.0 | |
| Conductivity (µS/cm) | 1,001 | 1,000 | 23.3 | READS 1,000 µS AFTER CAL |
| Conductivity (µS/cm) | 100.2 | 100 | 23.4 | |
| DO % Saturation | 99.7 | 100 | 23.8 | |
| POST Field Run CHECK | Meter Reading | Buffer / Cal Std | Temp °C | Comments |
| Conductivity (µS/cm) | 10.4 | 0 | 23.6 | |
| Conductivity (µS/cm) | 100.0 | 100 | 23.3 | |
| DO % Saturation | 99.3 | 100 | 23.6 | |

1. Dry the conductivity probe with a lab tissue (e.g., KimWipes®) and DI water.
2. Fill calibration cup to within a centimeter of the top of the calibration cup with DI water (0 µS).
3. Fill the calibration cup with 1,000 µS standard so that the temperature/conductivity probe is submerged.
4. Make sure there are no bubbles in the cell; wait 2 minutes.
5. Enter the appropriate standard value (1,000 µS/cm or 1.0 mS/cm) for Sp Cond.
6. Check conductivity using 100 µS/cm standard.

- Dissolved Oxygen Calibration Notes:**
1. Fill the calibration cup with about 1/2 inch of DI; it should be below the sensor cap.
 2. Use KimWipes® to dry any droplets from the sensor cap.
 3. Invert calibration cup's cap and gently rest it on the cup.
 4. Wait 5 minutes, making sure that temperature stabilizes.
 5. Determine local barometric pressure (mm Hg) and enter this value into the meter.
 6. Click "Calibrate". "Calibrate Successful" will be displayed.
 7. To retain calibration accuracy between measurements, store with the sensor immersed in water or within a water-saturated air environment such as a sealed storage cup with at least 10 ml of water.
 8. It is important to have the water-saturated air and the sensor at the same temperature. Therefore, store a jar of DI in the same environment as the sonde and calibrate in a similar air temperature as the water and sonde.
 9. Keep probe out of direct sun or wind.

FIELD SAMPLING SHEET - Redmond Paired Watershed Study



Field Personnel: AS/BB
 Sample Date: 5-21-18 Sample Time: 1120 PDT: 0
 Base Flow or Storm Event? Field Filtered Time: 1125 PST:
 (Must filter within 15 minutes of collection)

SITE ID: COLM
 Project Number: 14-05806-000

Water Quality Sampling

Sample ID: COLM-20180521

| Parameter | Bottle Type | Bottle Volume | # Bottles | Preservative | Duplicated? |
|---|-------------|---------------|-----------|--------------------------------|--------------------------------------|
| TSS and Turbidity | HDPE | 1L | 1 | NA | <u>N</u> |
| DOC * | HDPE | 250 ml | 1 | HCL | <div style="font-size: 2em;">↓</div> |
| Fecal Col. Bact. | HDPE | 250 ml | 1 | EDTA | |
| T. Phosphorous | HDPE | 250 ml | 1 | H ₂ SO ₄ | |
| T. Nitrogen | HDPE | 250 ml | 1 | H ₂ SO ₄ | |
| Diss. Cu and Zn * | HDPE | 250 ml | 1 | HNO ₃ | |
| Hardness, Total Cu and Zn | HDPE | 500 ml | 1 | HNO ₃ | |
| * - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump | | | | | |

Duplicate sample ID: NA
 Filter blank sample ID: NA
 Transfer blank sample ID: NA

Visual and Olfactory Conditions:

Clarity: CLEAR
 Color: ORANGE TINGE
 Odor: NONE
 Sheen: NONE
 Floatables: NONE

LABORATORY DELIVERY

Date: _____ Time: _____

Quality Assurance

Checked By: J. Lenth Signature: [Signature]
 Date Checked: _____ Time: _____
 Data Entered into Database? YES NO initials:
 Date Entered: _____ Time: _____
 Notes: _____

Project Name: Redmond Paired Watershed Study

Current Weather and Temp: PARTLY CLOUDY, 60°F

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

YSI Pro Plus (15D100020) _____
 YSI Pro DSS 1 _____
 YSI Pro DSS 2

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): 5.45
 Reference Point (description): STAFF GAGE

Water Quality Measurements

Temperature (°C) 12.7
 Specific Conductivity (µs/cm) 36.2
 Dissolved Oxygen (mg/L) 8.42

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: AS/ISB
 Sample Date: 5-21-18 Sample Time: 1540
 Base Flow or Storm Event? Storm Event? Field Filtered Time: 1545
 (Must filter within 15 minutes of collection)

SITE ID: COUM1
 Project Number: 14-05806-000



Project Name: Redmond Paired Watershed Study

Current Weather and Temp: PARTLY CLOUDY, 69°F

Water Quality Sampling

Sample ID: COUM1-20180521

| Parameter | Bottle Type | Bottle Volume | # Bottles | Preservative | Duplicated? |
|---------------------------|-------------|---------------|-----------|--------------------------------|-------------|
| TSS and Turbidity | HDPE | 1L | 1 | NA | <u>N</u> |
| DOC * | HDPE | 250 ml | 1 | HCL | ↓ |
| Fecal Col. Bact. | HDPE | 250 ml | 1 | EDTA | |
| T. Phosphorous | HDPE | 250 ml | 1 | H ₂ SO ₄ | |
| T. Nitrogen | HDPE | 250 ml | 1 | H ₂ SO ₄ | |
| Diss. Cu and Zn * | HDPE | 250 ml | 1 | HNO ₃ | |
| Hardness, Total Cu and Zn | HDPE | 500 ml | 1 | HNO ₃ | |

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID: NA
 Filter blank sample ID: NA
 Transfer blank sample ID: NA

Visual and Olfactory Conditions:

Clarity: CLEAR
 Color: ↓
 Odor: ↓
 Sheen: ↓
 Floatables: ↓

LABORATORY DELIVERY

Date: _____ Time: _____

Field Meter Calibration

Check which field meter was used and complete the meter calibration form
 YSI Pro Plus (15D100020) _____
 YSI Pro DSS 1 _____
 YSI Pro DSS 2 X

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)
 Stream Stage (ft): 2.66
 Reference Point (description): STAFF GAGE

Water Quality Measurements

Temperature (°C) 13.0
 Specific Conductivity (µs/cm) 332.8
 Dissolved Oxygen (mg/L) 10.31

Quality Assurance

Checked By: J. Leath Signature: [Signature]
 Date Checked: _____ Time: _____
 Data Entered into Database? YES NO initials:
 Date Entered: _____ Time: _____
 Notes: _____

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: AS/BB

Sample Date: 5-21-18 Sample Time: 1525 PDT:

Base Flow or Storm Event? Field Filtered Time: 1530 PST:
(Must filter within 15 minutes of collection)

SITE ID: COUMO

Project Number: 14-05806-000

Project Name: Redmond Paired Watershed Study

Current Weather and Temp: PARTLY CLOUDY, 68°F



Water Quality Sampling

Sample ID: COUMO-20180521

| Parameter | Bottle Type | Bottle Volume | # Bottles | Preservative | Duplicated? |
|---------------------------|-------------|---------------|-----------|--------------------------------|--|
| TSS and Turbidity | HDPE | 1L | 1 | NA | <u>N</u> |
| DOC * | HDPE | 250 ml | 1 | HCL | <div style="display: flex; align-items: center; justify-content: center;"> ↓ </div> |
| Fecal Col. Bact. | HDPE | 250 ml | 1 | EDTA | |
| T. Phosphorous | HDPE | 250 ml | 1 | H ₂ SO ₄ | |
| T. Nitrogen | HDPE | 250 ml | 1 | H ₂ SO ₄ | |
| Diss. Cu and Zn * | HDPE | 250 ml | 1 | HNO ₃ | |
| Hardness, Total Cu and Zn | HDPE | 500 ml | 1 | HNO ₃ | |
| | | | | | |

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID: NA
 Filter blank sample ID: NA
 Transfer blank sample ID: NA

Visual and Olfactory Conditions:

Clarity: CLEAR
 Color: NONE
 Odor:
 Sheen:
 Floatables:
LABORATORY DELIVERY

Date: _____ Time: _____

Quality Assurance

Checked By: S. Lenth Signature: [Signature]
 Date Checked: _____ Time: _____
 Data Entered into Database? YES NO initials: _____
 Date Entered: _____ Time: _____
 Notes: _____

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

YSI Pro Plus (15D100020) _____
 YSI Pro DSS 1 _____
 YSI Pro DSS 2 _____

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): 1.26
 Reference Point (description): STAFF GAGE

Water Quality Measurements

Temperature (°C) 13.6
 Specific Conductivity (µs/cm) 275.2
 Dissolved Oxygen (mg/L) 10.00

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: AS/BB
 Sample Date: 5-21-12 Sample Time: 1425
 Base Flow or Storm Event? _____ Field Filtered Time: 1430
 (Must filter within 15 minutes of collection)

SITE ID: EVAMS
 PDT PST
 Project Number: 14-05806-000



Project Name: Redmond Paired Watershed Study
 Current Weather and Temp: PARTLY CLOUDY, 62°F

Water Quality Sampling

Sample ID: EVAMS-20120521

| Parameter | Bottle Type | Bottle Volume | # Bottles | Preservative | Duplicated? |
|---------------------------|-------------|---------------|-----------|--------------------------------|-------------|
| TSS and Turbidity | HDPE | 1L | 1 | NA | N |
| DOC * | HDPE | 250 ml | 1 | HCL | ↓ |
| Fecal Col. Bact. | HDPE | 250 ml | 1 | EDTA | |
| T. Phosphorous | HDPE | 250 ml | 1 | H ₂ SO ₄ | |
| T. Nitrogen | HDPE | 250 ml | 1 | H ₂ SO ₄ | |
| Diss. Cu and Zn * | HDPE | 250 ml | 1 | HNO ₃ | |
| Hardness, Total Cu and Zn | HDPE | 500 ml | 1 | HNO ₃ | ↓ |

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID: NA
 Filter blank sample ID: NA
 Transfer blank sample ID: NA

Visual and Olfactory Conditions:

Clarity: CLEAR
 Color: NONE
 Odor: _____
 Sheen: _____
 Floatables: _____

LABORATORY DELIVERY

Date: _____ Time: _____

Quality Assurance

Checked By: T. Lenth Signature: [Signature]
 Date Checked: _____ Time: _____
 Data Entered into Database? YES NO initials:
 Date Entered: _____ Time: _____
 Notes: _____

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

YSI Pro Plus (15D100020) _____
 YSI Pro DSS 1 _____
 YSI Pro DSS 2 _____

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): 3.90
 Reference Point (description): STAFF GAGE

Water Quality Measurements

Temperature (°C) 12.8
 Specific Conductivity (µs/cm) 216.8
 Dissolved Oxygen (mg/L) 10.37

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: AS/BB
 Sample Date: 5.21.18 Sample Time: 1440 PDT
 Base Flow or Storm Event? Field Filtered Time: 1445 PST
 (Must filter within 15 minutes of collection)

SITE ID: EVALSS
 Project Number: 14-05806-000



Project Name: Redmond Paired Watershed Study

Current Weather and Temp: PARTLY CLOUDY, 68°F

Water Quality Sampling

Sample ID: EVALSS-20180521

| Parameter | Bottle Type | Bottle Volume | # Bottles | Preservative | Duplicated? |
|---------------------------|-------------|---------------|-----------|--------------------------------|-------------|
| TSS and Turbidity | HDPE | 1L | 1 | NA | N |
| DOC * | HDPE | 250 ml | 1 | HCL | ↓ |
| Fecal Col. Bact | HDPE | 250 ml | 1 | EDTA | |
| T. Phosphorous | HDPE | 250 ml | 1 | H ₂ SO ₄ | |
| T. Nitrogen | HDPE | 250 ml | 1 | H ₂ SO ₄ | |
| Diss. Cu and Zn * | HDPE | 250 ml | 1 | HNO ₃ | |
| Hardness, Total Cu and Zn | HDPE | 500 ml | 1 | HNO ₃ | |
| | | | | | |

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID: NA
 Filter blank sample ID: NA
 Transfer blank sample ID: NA

Visual and Olfactory Conditions:

Clarity: CLEAR
 Color: NONE
 Odor: ↓
 Sheen: ↓
 Floatables: ↓

LABORATORY DELIVERY

Date: _____ Time: _____

Quality Assurance

Checked By: J. Lenth Signature: [Signature]
 Date Checked: _____ Time: _____
 Data Entered into Database? YES NO initials:
 Date Entered: _____ Time: _____
 Notes: _____

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

YSI Pro Plus (15D100020) _____
 YSI Pro DSS 1 _____
 YSI Pro DSS 2 _____

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): 2.29
 Reference Point (description): STAFF GAGE

Water Quality Measurements

Temperature (°C) 12.6
 Specific Conductivity (µs/cm) 198.8
 Dissolved Oxygen (mg/L) 10.59

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: AS/BB
 Sample Date: 5-21-18 Sample Time: 1315 PDT
 Base Flow or Storm Event? Field Filtered Time: 1320 PST
 (Must filter within 15 minutes of collection)

SITE ID: MONMN
 Project Number: 14-05806-000



Project Name: Redmond Paired Watershed Study
 Current Weather and Temp: PARTLY CLOUDY, 66°F

Water Quality Sampling

Sample ID: MONMN-20180521

| Parameter | Bottle Type | Bottle Volume | # Bottles | Preservative | Duplicated? |
|---------------------------|-------------|---------------|-----------|--------------------------------|-------------|
| TSS and Turbidity | HDPE | 1L | 1 | NA | <u>N</u> |
| DOC * | HDPE | 250 ml | 1 | HCL | <u>N</u> |
| Fecal Col. Bact. | HDPE | 250 ml | 1 | EDTA | <u>N</u> |
| T. Phosphorous | HDPE | 250 ml | 1 | H ₂ SO ₄ | <u>N</u> |
| T. Nitrogen | HDPE | 250 ml | 1 | H ₂ SO ₄ | <u>N</u> |
| Diss. Cu and Zn * | HDPE | 250 ml | 1 | HNO ₃ | <u>N</u> |
| Hardness, Total Cu and Zn | HDPE | 500 ml | 1 | HNO ₃ | <u>N</u> |

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID: NA
 Filter blank sample ID: NA
 Transfer blank sample ID: NA

Visual and Olfactory Conditions:

Clarity: CLEAR
 Color: NONE
 Odor: NONE
 Sheen: NONE
 Floatables: NONE

LABORATORY DELIVERY

Date: _____ Time: _____

Quality Assurance

Checked By: J. Lenta Signature: [Signature]
 Date Checked: _____ Time: _____
 Data Entered into Database? YES NO initials: _____
 Date Entered: _____ Time: _____
 Notes: _____

Field Meter Calibration

Check which field meter was used and complete the meter calibration form
 YSI Pro Plus (15D100020) _____
 YSI Pro DSS 1 _____
 YSI Pro DSS 2 _____

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)
 Stream Stage (ft): 0.11 (9.11)
 Reference Point (description): STAFF GAGE

Water Quality Measurements

Temperature (°C) 13.3
 Specific Conductivity (µs/cm) 197.6
 Dissolved Oxygen (mg/L) 9.67

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: AS/BB

Sample Date: 5-21-18

Sample Time: 1325

PDT

SITE ID: MONMS

Base Flow or Storm Event?

Field Filtered Time: 1330

PST

Project Number: 14-05806-000

(Must filter within 15 minutes of collection)



Project Name: Redmond Paired Watershed Study

Water Quality Sampling

Sample ID: MONMS-20180521

Current Weather and Temp: PARTLY CLOUDY, 67°F

| Parameter | Bottle Type | Bottle Volume | # Bottles | Preservative | Duplicated? |
|---------------------------|-------------|---------------|-----------|--------------------------------|-------------|
| TSS and Turbidity | HDPE | 1L | 1 | NA | N |
| DOC * | HDPE | 250 ml | 1 | HCL | ↓ |
| Fecal Col. Bact. | HDPE | 250 ml | 1 | EDTA | |
| T. Phosphorous | HDPE | 250 ml | 1 | H ₂ SO ₄ | |
| T. Nitrogen | HDPE | 250 ml | 1 | H ₂ SO ₄ | |
| Diss. Cu and Zn * | HDPE | 250 ml | 1 | HNO ₃ | |
| Hardness, Total Cu and Zn | HDPE | 500 ml | 1 | HNO ₃ | ↓ |

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID: NA

Filter blank sample ID: NA

Transfer blank sample ID: NA

Visual and Olfactory Conditions:

Clarity: CLEAR
 Color: NONE
 Odor: ↓
 Sheen: ↓
 Floatables: ↓

LABORATORY DELIVERY

Date:

Time:

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

YSI Pro Plus (15D100020) _____

YSI Pro DSS 1 _____

YSI Pro DSS 2 _____

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): 6.78

Reference Point (description): DTW / WLI

Water Quality Measurements

Temperature (°C) 13.8

Specific Conductivity (µs/cm) 354.0

Dissolved Oxygen (mg/L) 7.94

Quality Assurance

Checked By: J. Leach

Signature: [Signature]

Date Checked:

Time:

Data Entered into Database?

YES NO initials:

Date Entered:

Time:

Notes:

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: MB AS
 Sample Date: 5-21-18 Sample Time: _____
 Base Flow or Storm Event? Field Filtered Time: _____
 (Must filter within 15 minutes of collection)

SITE ID: MONM
 Project Number: 14-05806-000



Water Quality Sampling

Sample ID: MONM-20180521

| Parameter | Bottle Type | Bottle Volume | # Bottles | Preservative | Duplicated? |
|---------------------------|-------------|---------------|-----------|--------------------------------|-------------|
| TSS and Turbidity | HDPE | 1L | 1 | NA | N |
| DOC * | HDPE | 250 ml | 1 | HCL | |
| Fecal Col. Bact. | HDPE | 250 ml | 1 | EDTA | |
| T. Phosphorous | HDPE | 250 ml | 1 | H ₂ SO ₄ | |
| T. Nitrogen | HDPE | 250 ml | 1 | H ₂ SO ₄ | |
| Diss. Cu and Zn * | HDPE | 250 ml | 1 | HNO ₃ | |
| Hardness, Total Cu and Zn | HDPE | 500 ml | 1 | HNO ₃ | Y |

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID: _____
 Filter blank sample ID: _____
 Transfer blank sample ID: _____

Visual and Olfactory Conditions:

Clarity: clear
 Color: NONE
 Odor: _____
 Sheen: _____
 Floatables: _____

LABORATORY DELIVERY

Date: _____ Time: _____

Quality Assurance

Checked By: J Lenth Signature: [Signature]
 Date Checked: _____ Time: _____
 Data Entered into Database? YES NO initials: _____
 Date Entered: _____ Time: _____
 Notes: _____

Project Name: Redmond Paired Watershed Study

Current Weather and Temp: SUNNY 67°F

Field Meter Calibration

Check which field meter was used and complete the meter calibration form
 YSI Pro Plus (15D100020) _____
 YSI Pro DSS 1 _____
 YSI Pro DSS 2 _____

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)
 Stream Stage (ft): NA
 Reference Point (description): NA

Water Quality Measurements

Temperature (°C) 12.5
 Specific Conductivity (µs/cm) 10.47
 Dissolved Oxygen (mg/L) 237.0

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: AS/B3
 Sample Date: 5-21-18 Sample Time: 1040 PDT:
 Base Flow or Storm Event? Field Filtered Time: 1045 PST:
(Must filter within 15 minutes of collection)

SITE ID: SEIMN
 Project Number: 14-05806-000



Project Name: Redmond Paired Watershed Study

Current Weather and Temp: PARTLY CLOUDY + 59°F

Water Quality Sampling

Sample ID: SEIMN-20180521

| Parameter | Bottle Type | Bottle Volume | # Bottles | Preservative | Duplicated? |
|---------------------------|-------------|---------------|-----------|--------------------------------|-------------|
| TSS and Turbidity | HDPE | 1L | 1 | NA | N ↓ Y |
| DOC * | HDPE | 250 ml | 1 | HCL | |
| Fecal Col. Bact. | HDPE | 250 ml | 1 | EDTA | |
| T. Phosphorous | HDPE | 250 ml | 1 | H ₂ SO ₄ | |
| T Nitrogen | HDPE | 250 ml | 1 | H ₂ SO ₄ | |
| Diss. Cu and Zn * | HDPE | 250 ml | 1 | HNO ₃ | |
| Hardness, Total Cu and Zn | HDPE | 500 ml | 1 | HNO ₃ | |

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID: NA
 Filter blank sample ID: NA
 Transfer blank sample ID: NA

Visual and Olfactory Conditions:

Clarity: VERY CLEAR
 Color: NONE
 Odor: NONE
 Sheen: NONE
 Floatables: NONE

LABORATORY DELIVERY

Date: _____ Time: _____

Quality Assurance

Checked By: J. Lenth Signature: [Signature]
 Date Checked: _____ Time: _____
 Data Entered into Database? YES NO initials: _____
 Date Entered: _____ Time: _____
 Notes: _____

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

YSI Pro Plus (15D100020) _____
 YSI Pro DSS 1 _____
 YSI Pro DSS 2

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): 8.875

Reference Point (description): BOLT TO H₂O SURFACE

Water Quality Measurements

Temperature (°C) 11.0

Specific Conductivity (µs/cm) 89.6

Dissolved Oxygen (mg/L) 10.8E

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: AS/BS
 Sample Date: 5-21-18 Sample Time: 1240 PDT:
 Base Flow or Storm Event? Field Filtered Time: 1245 PST:
 (Must filter within 15 minutes of collection)

SITE ID: SEIMS
 Project Number: 14-05806-000



Project Name: Redmond Paired Watershed Study

Current Weather and Temp: MOSTLY CLOUDY 60°F

Water Quality Sampling

Sample ID: SEIMS-20180521

| Parameter | Bottle Type | Bottle Volume | # Bottles | Preservative | Duplicated? |
|---------------------------|-------------|---------------|-----------|--------------------------------|-------------|
| TSS and Turbidity | HDPE | 1L | 1 | NA | Y |
| DOC * | HDPE | 250 ml | 1 | HCL | ↓ |
| Fecal Col. Bact. | HDPE | 250 ml | 1 | EDTA | |
| T. Phosphorous | HDPE | 250 ml | 1 | H ₂ SO ₄ | |
| T. Nitrogen | HDPE | 250 ml | 1 | H ₂ SO ₄ | |
| Diss. Cu and Zn * | HDPE | 250 ml | 1 | HNO ₃ | |
| Hardness, Total Cu and Zn | HDPE | 500 ml | 1 | HNO ₃ | |

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID: QA4B-20180521 1250 AS
 Filter blank sample ID: _____
 Transfer blank sample ID: _____

Visual and Olfactory Conditions:

Clarity: CLEAR
 Color: SLIGHT TANNIN (LIGHT BROWN) COLOR
 Odor: NONE
 Sheen: NONE
 Floatables: NONE

LABORATORY DELIVERY

Date: _____ Time: _____

Quality Assurance

Checked By: J. Cumb Signature: [Signature]
 Date Checked: _____ Time: _____
 Data Entered into Database? YES NO initials: _____
 Date Entered: _____ Time: _____
 Notes: _____

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

YSI Pro Plus (15D100020) _____
 YSI Pro DSS 1 _____
 YSI Pro DSS 2

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): 0.75
 Reference Point (description): STAFF CASE

Water Quality Measurements

Temperature (°C) 11.8
 Specific Conductivity (µs/cm) 114.4
 Dissolved Oxygen (mg/L) 10.38

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: AS / JB
 Sample Date: 5.21.18 Sample Time: 1615 PDT:
 Base Flow or Storm Event? Field Filtered Time: 1620 PST:
 (Must filter within 15 minutes of collection)

SITE ID: TOSM#
 Project Number: 14-05806-000



Project Name: Redmond Paired Watershed Study

Current Weather and Temp: PARTLY CLOUDY, 69°F

Water Quality Sampling

Sample ID: TOSM1-20180521

| Parameter | Bottle Type | Bottle Volume | # Bottles | Preservative | Duplicated? |
|---------------------------|-------------|---------------|-----------|--------------------------------|-------------|
| TSS and Turbidity | HDPE | 1L | 1 | NA | <u>N</u> |
| DOC * | HDPE | 250 ml | 1 | HCL | |
| Fecal Col. Bact. | HDPE | 250 ml | 1 | EDTA | |
| T. Phosphorous | HDPE | 250 ml | 1 | H ₂ SO ₄ | |
| T. Nitrogen | HDPE | 250 ml | 1 | H ₂ SO ₄ | |
| Diss. Cu and Zn * | HDPE | 250 ml | 1 | HNO ₃ | |
| Hardness, Total Cu and Zn | HDPE | 500 ml | 1 | HNO ₃ | <u>Y</u> |

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID: NA
 Filter blank sample ID: NA
 Transfer blank sample ID: NA

Visual and Olfactory Conditions:

Clarity: CLEAR
 Color: NONE
 Odor: ↓
 Sheen: ↓
 Floatables: ↓

LABORATORY DELIVERY

Date: _____ Time: _____

Quality Assurance

Checked By: J. C. Smith Signature: [Signature]
 Date Checked: _____ Time: _____
 Data Entered into Database? YES NO initials: _____
 Date Entered: _____ Time: _____
 Notes: _____

Field Meter Calibration

Check which field meter was used and complete the meter calibration form
YSI Pro Plus (15D100020)
YSI Pro DSS 1
YSI Pro DSS 2

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)
 Stream Stage (ft): 0.71
 Reference Point (description): S.G.

Water Quality Measurements

Temperature (°C) 13.2
 Specific Conductivity (µs/cm) 304.8
 Dissolved Oxygen (mg/L) 10.16

FIELD SAMPLING SHEET - Redmond Paired Watershed Study



Field Personnel: AS/BB
 Sample Date: 5-21-18 Sample Time: 1555 PDT:
 Base Flow or Storm Event? Field Filtered Time: 1600 PST:
 (Must filter within 15 minutes of collection)

SITE ID: TOSMO
 Project Number: 14-05806-000

Project Name: Redmond Paired Watershed Study

Current Weather and Temp: PARTLY CLOUDY

Water Quality Sampling

Sample ID: TOSMC-20180521

| Parameter | Bottle Type | Bottle Volume | # Bottles | Preservative | Duplicated? |
|---------------------------|-------------|---------------|-----------|--------------------------------|-------------|
| TSS and Turbidity | HDPE | 1L | 1 | NA | N |
| DOC * | HDPE | 250 ml | 1 | HCL | ↓ |
| Fecal Col. Bact. | HDPE | 250 ml | 1 | EDTA | ↓ |
| T. Phosphorous | HDPE | 250 ml | 1 | H ₂ SO ₄ | ↓ |
| T. Nitrogen | HDPE | 250 ml | 1 | H ₂ SO ₄ | ↓ |
| Diss. Cu and Zn * | HDPE | 250 ml | 1 | HNO ₃ | ↓ |
| Hardness, Total Cu and Zn | HDPE | 500 ml | 1 | HNO ₃ | ↓ |

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID: NA
 Filter blank sample ID: NA
 Transfer blank sample ID: NA

Visual and Olfactory Conditions:

Clarity: CLEAR
 Color: NONE
 Odor: ↓
 Sheen: ↓
 Floatables: ↓

LABORATORY DELIVERY

Date: _____ Time: _____

Quality Assurance

Checked By: Z. Lenth Signature: [Signature]
 Date Checked: _____ Time: _____
 Data Entered into Database? YES NO initials:
 Date Entered: _____ Time: _____
 Notes: _____

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

YSI Pro Plus (15D100020) _____
 YSI Pro DSS 1 _____
 YSI Pro DSS 2 _____

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): 0.55
 Reference Point (description): S.G.

Water Quality Measurements

Temperature (°C) 12.8
 Specific Conductivity (µs/cm) 268.1
 Dissolved Oxygen (mg/L) 10.52

FIELD SAMPLING SHEET - Redmond Paired Watershed Study



Field Personnel: AS/BE
 Sample Date: 5-21-18 Sample Time: 1400 PDT
 Base Flow or Storm Event? Field Filtered Time: 1405 PST
 (Must filter within 15 minutes of collection)

SITE ID: TYLMI
 Project Number: 14-05806-000

Project Name: Redmond Paired Watershed Study
 Current Weather and Temp: 67° F, PARTLY CLOUDY

Water Quality Sampling

Sample ID: TYLMI-20180521

| Parameter | Bottle Type | Bottle Volume | # Bottles | Preservative | Duplicated? |
|---------------------------|-------------|---------------|-----------|--------------------------------|-------------|
| TSS and Turbidity | HDPE | 1L | 1 | NA | N |
| DOC * | HDPE | 250 ml | 1 | HCL | ↓ |
| Fecal Col Bact | HDPE | 250 ml | 1 | EDTA | |
| T. Phosphorous | HDPE | 250 ml | 1 | H ₂ SO ₄ | |
| T. Nitrogen | HDPE | 250 ml | 1 | H ₂ SO ₄ | |
| Diss. Cu and Zn * | HDPE | 250 ml | 1 | HNO ₃ | |
| Hardness, Total Cu and Zn | HDPE | 500 ml | 1 | HNO ₃ | |

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID: NA
 Filter blank sample ID: NA
 Transfer blank sample ID: NA

Visual and Olfactory Conditions:

Clarity: CLEAR
 Color: NONE
 Odor: ↓
 Sheen: ↓
 Floatables: ↓

LABORATORY DELIVERY

Date: _____ Time: _____

Quality Assurance

Checked By: J. Lenth Signature: [Signature]
 Date Checked: _____ Time: _____
 Data Entered into Database? YES NO initials: _____
 Date Entered: _____ Time: _____
 Notes: _____

Field Meter Calibration

Check which field meter was used and complete the meter calibration form
 YSI Pro Plus (15D100020) _____
 YSI Pro DSS 1 _____
 YSI Pro DSS 2 ✓

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): 4.58

Reference Point (description): TOP OF CURRENT TO H₂O SURFACE

Water Quality Measurements

Temperature (°C) 13.4

Specific Conductivity (µs/cm) 245.5

Dissolved Oxygen (mg/L) 9.40

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

 Field Personnel: AS/BB

 Sample Date: 5.21.18

 Sample Time: 1345

 PDT

 SITE ID: TYLMO

 Base Flow or Storm Event?

 Field Filtered Time: 1350

 PST

 Project Number: 14-05806-000

(Must filter within 15 minutes of collection)

 Project Name: Redmond Paired Watershed Study

HERRERA

 Current Weather and Temp: MOSTLY SUNNY, 66°F

Water Quality Sampling

 Sample ID: TYLMO-20180521

| Parameter | Bottle Type | Bottle Volume | # Bottles | Preservative | Duplicated? |
|---------------------------|-------------|---------------|-----------|--------------------------------|-------------|
| TSS and Turbidity | HDPE | 1L | 1 | NA | N |
| DOC * | HDPE | 250 ml | 1 | HCL | ↓ |
| Fecal Col. Bact. | HDPE | 250 ml | 1 | EDTA | |
| T. Phosphorous | HDPE | 250 ml | 1 | H ₂ SO ₄ | |
| T Nitrogen | HDPE | 250 ml | 1 | H ₂ SO ₄ | |
| Diss. Cu and Zn * | HDPE | 250 ml | 1 | HNO ₃ | |
| Hardness, Total Cu and Zn | HDPE | 500 ml | 1 | HNO ₃ | |

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

 Duplicate sample ID: NA

 Filter blank sample ID: NA

 Transfer blank sample ID: NA

Visual and Olfactory Conditions:

 Clarity: CLEAR

 Color: NONE

 Odor: ↓

 Sheen: ↓

 Floatables: ↓

LABORATORY DELIVERY

Date: _____

Time: _____

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

YSI Pro Plus (15D100020)
YSI Pro DSS 1
YSI Pro DSS 2

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

 Stream Stage (ft): 2.88

 Reference Point (description): CULVERT 21M TO H₂O SURFACE

Water Quality Measurements

 Temperature (°C) 12.9

 Specific Conductivity (µs/cm) 212.2

 Dissolved Oxygen (mg/L) 10.31

Quality Assurance

 Checked By: J. Leuth

 Signature: [Signature]

Date Checked: _____

Time: _____

Data Entered into Database?

YES

NO

initials: _____

Date Entered: _____

Time: _____

Notes: _____



HERRERA

Data Quality Assurance Worksheet

Project Name/No./Client: Redmond Paired Watershed Study / 14-05806-000 / City of Redmond

Laboratory/Parameters: OnSite Environmental : TSS, turbidity, hardness, DOC, TP, Dissolved & Total Cu, Zn / AmTest: Total nitrogen, fecal coliform bacteria

Sample Date/Sample ID: 5/21/2018 / All locations, QA48 (SEIMS)

By G. Catarra

Date 7/3/2018 Page 1 of 2

Checked: initials JL

date 7/13/2018

| Parameter | Completeness/ Methodology | Pre-preservation Holding Times (minutes) | | Total Holding Times (days) | | Method Blanks Reporting Limit | Matrix Spikes/ Surrogate Recovery (%) | | Lab Control Samples Recovery (%) | | Lab Duplicates RPD (%) | | Field Duplicates RPD (%) | | Instrument Calibration/ Performance | ACTION |
|-------------------------------------|------------------------------|--|------|-------------------------------|------|--|---|-------------------|--|-------------------|---------------------------|-------------------|-----------------------------|-------------------|---|--------|
| | | Reported | Goal | Reported | Goal | | Reported | Goal ¹ | Reported | Goal ¹ | Reported | Goal ¹ | Reported | Goal ¹ | | |
| TSS | OK / SM 2540D | NA | NA | 2 | ≤7 | ≤1.0 mg/L 1.0 mg/L | NA | NA | 90 | ±20 | 7 | ≤25 | 3.2 | ≤25 | OK | NONE |
| Turbidity | OK / EPA 180.1 | NA | NA | 1 | ≤2 | ≤0.1 NTU 0.1 NTU | NA | NA | NA | ±10 | 3 | ≤25 | 20 | ≤25 | OK | NONE |
| Hardness | OK / SM 2340B | NA | NA | 8 | ≤180 | ≤1.0 mg/L 1.0 mg/L | 114,109 | ±25 | 108 | ±15 | 1 | ≤20 | 2.1 | ≤20 | OK | NONE |
| DOC | OK / SM 5310B | <15 | ≤15 | 4 | ≤28 | ≤1.0 mg/L 1.0 mg/L | 107 | ±25 | 107 | ±15 | 1 | ≤20 | 6.4 | ≤20 | OK | NONE |
| Total Phosphorus | OK / EPA 365.1 | NA | NA | 8 | ≤28 | ≤0.01 mg/L 0.01 mg/L | 96 | ±25 | 97 | ±20 | 6 | ≤20 | D=0.001 | ≤20 | OK | None |
| Total Nitrogen (TKN + N+N) | OK/ SM 4500 N-B | NA | NA | 15-18 | ≤28 | ≤0.1 mg/L 0.1 mg/L | 102-109 | ±25 | 95-103 | ±20 | NC,4.4 | ≤20 | NC, 4.1 | ≤20 | OK | NONE |

¹ If the sample or duplicate value is less than five times the reporting limit, the difference is calculated rather than the relative percent difference (RPD). The QA goal is a difference <2 times the detection limit instead of the number indicated in the goal column.

NA – not applicable or not available; NC – not calculable due to one or more values below the detection limit; NS – field duplicate not sampled.



Data Quality Assurance Worksheet

By G. Catarra

Project Name/No./Client: Redmond Paired Watershed Study / 14-05806-000 / City of Redmond

Date 7/3/2018 Page 2 of 2

Laboratory/Parameters: OnSite Environmental : TSS, turbidity, hardness, DOC, TP, Dissolved & Total Cu, Zn / AmTest: total nitrogen, fecal coliform bacteria

Checked: initials
JL

Sample Date/Sample ID: 5/21/2018 / All locations, QA48 (SEIMS)

date 7/13/2018

| Parameter | Completeness/ Methodology | Pre-preservation Holding Times (minutes) | | Total Holding Times (days) | | Method Blanks Reporting Limit | Matrix Spikes/ Surrogate Recovery (%) | | Lab Control Samples Recovery (%) | | Lab Duplicates RPD (%) | | Field Duplicates RPD (%) | | Instrument Calibration/ Performance | ACTION |
|------------------|------------------------------|--|------|-------------------------------|------|--|---|-------------------|--|------|---------------------------|-------------------|-----------------------------|-------------------|---|--------------------------|
| | | Reported | Goal | Reported | Goal | | Reported | Goal ¹ | Reported | Goal | Reported | Goal ¹ | Reported | Goal ¹ | | |
| Total Copper | OK/ EPA 200.8 | NA | NA | 4 | ≤180 | ≤1.0 µg/L 1.0 µg/L | 101,96 | ±25 | NR | ±15 | NC | ≤20 | NC | ≤20 | OK | NONE |
| Total Zinc | OK/ EPA 200.8 | NA | NA | 4 | ≤180 | ≤5.0 µg/L 5.0 µg/L | 117,117 | ±25 | NR | ±15 | 1 | ≤20 | NC | ≤20 | OK | NONE |
| Dissolved Copper | OK/ EPA 200.8 | <15 | ≤15 | 3 | ≤180 | ≤1.0 µg/L 1.0 µg/L | 97,95 | ±25 | NR | ±15 | NC | ≤20 | NC | ≤20 | OK | NONE |
| Dissolved Zinc | OK/ EPA 200.8 | <15 | ≤15 | 3 | ≤180 | ≤5.0 µg/L 5.0 µg/L | 107,106 | ±25 | NR | ±15 | NC | ≤20 | NC | ≤20 | OK | NONE |
| Fecal Coliform | OK/ SM 9222D | NA | NA | 1 | ≤1 | ≤1.0 cfu/ 100mL 10 cfu/ 100mL | NA | NA | NA | NA | NC, 0 | ≤35 | D=10 | ≤50 | OK | FLAG SEIMS "J" DUE TO FD |

¹ If the sample or duplicate value is less than five times the reporting limit, the difference is calculated rather than the relative percent difference (RPD). The QA goal is a difference <2 times the detection limit instead of the number indicated in the goal column.

NA – not applicable or not available; NC – not calculable due to one or more values below the detection limit; NS – field duplicate not sampled.



14648 NE 95th Street, Redmond, WA 98052 • (425) 883-3881

July 5, 2018

John Lenth
Herrera Environmental Consultants, Inc.
2200 6th Avenue, Suite 1100
Seattle, WA 98121

Re: Analytical Data for Project 14-05806-000
Laboratory Reference No. 1806-100

Dear John:

Enclosed are the analytical results and associated quality control data for samples submitted on June 9, 2018.

The standard policy of OnSite Environmental, Inc. is to store your samples for 30 days from the date of receipt. If you require longer storage, please contact the laboratory.

We appreciate the opportunity to be of service to you on this project. If you have any questions concerning the data, or need additional information, please feel free to call me.

Sincerely,

A handwritten signature in black ink, appearing to read "Blair Goodrow", enclosed within a large, loopy circular flourish.

Blair Goodrow
Project Manager

Enclosures



OnSite Environmental, Inc. 14648 NE 95th Street, Redmond, WA 98052 (425) 883-3881

This report pertains to the samples analyzed in accordance with the chain of custody, and is intended only for the use of the individual or company to whom it is addressed.

Date of Report: July 5, 2018
Samples Submitted: June 9, 2018
Laboratory Reference: 1806-100
Project: 14-05806-000

Case Narrative

Samples were collected on June 8, 2018 and received by the laboratory on June 9, 2018. They were maintained at the laboratory at a temperature of 2°C to 6°C.

Please note that any and all soil sample results are reported on a dry-weight basis, unless otherwise noted below.

General QA/QC issues associated with the analytical data enclosed in this laboratory report will be indicated with a reference to a comment or explanation on the Data Qualifier page. More complex and involved QA/QC issues will be discussed in detail below.

Total Suspended Solids SM 2540D Analysis

The duplicate RPD for Total Suspended Solids is outside control limits due to sample inhomogeneity. The samples were not re-extracted because of limited sample and the samples had exceeded the holding times.

Any other QA/QC issues associated with this extraction and analysis will be indicated with a footnote reference and discussed in detail on the Data Qualifier page.



Date of Report: July 5, 2018
 Samples Submitted: June 9, 2018
 Laboratory Reference: 1806-100
 Project: 14-05806-000

TOTAL METALS
EPA 200.8

Matrix: Water
 Units: ug/L (ppb)

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|-------------------|----------------------|-----|-----------|---------------|---------------|-------|
| Client ID: | COLM-20180608 | | | | | |
| Laboratory ID: | 06-100-01 | | | | | |
| Copper | ND | 1.0 | EPA 200.8 | 6-12-18 | 6-13-18 | |
| Zinc | ND | 5.0 | EPA 200.8 | 6-12-18 | 6-13-18 | |

| | | | | | | |
|-------------------|-----------------------|-----|-----------|---------|---------|--|
| Client ID: | COUMI-20180608 | | | | | |
| Laboratory ID: | 06-100-02 | | | | | |
| Copper | 2.1 | 1.0 | EPA 200.8 | 6-12-18 | 6-13-18 | |
| Zinc | 7.5 | 5.0 | EPA 200.8 | 6-12-18 | 6-13-18 | |

| | | | | | | |
|-------------------|-----------------------|-----|-----------|---------|---------|--|
| Client ID: | COUMO-20180608 | | | | | |
| Laboratory ID: | 06-100-03 | | | | | |
| Copper | 3.9 | 1.0 | EPA 200.8 | 6-12-18 | 6-13-18 | |
| Zinc | 16 | 5.0 | EPA 200.8 | 6-12-18 | 6-13-18 | |

| | | | | | | |
|-------------------|-----------------------|-----|-----------|---------|---------|--|
| Client ID: | EVAMS-20180608 | | | | | |
| Laboratory ID: | 06-100-04 | | | | | |
| Copper | ND | 1.0 | EPA 200.8 | 6-12-18 | 6-13-18 | |
| Zinc | ND | 5.0 | EPA 200.8 | 6-12-18 | 6-13-18 | |

| | | | | | | |
|-------------------|------------------------|-----|-----------|---------|---------|--|
| Client ID: | EVALSS-20180608 | | | | | |
| Laboratory ID: | 06-100-05 | | | | | |
| Copper | ND | 1.0 | EPA 200.8 | 6-12-18 | 6-13-18 | |
| Zinc | ND | 5.0 | EPA 200.8 | 6-12-18 | 6-13-18 | |

| | | | | | | |
|-------------------|-----------------------|-----|-----------|---------|---------|--|
| Client ID: | MONMN-20180608 | | | | | |
| Laboratory ID: | 06-100-06 | | | | | |
| Copper | ND | 1.0 | EPA 200.8 | 6-12-18 | 6-13-18 | |
| Zinc | 12 | 5.0 | EPA 200.8 | 6-12-18 | 6-13-18 | |

| | | | | | | |
|-------------------|-----------------------|-----|-----------|---------|---------|--|
| Client ID: | MONMS-20180608 | | | | | |
| Laboratory ID: | 06-100-07 | | | | | |
| Copper | ND | 1.0 | EPA 200.8 | 6-12-18 | 6-13-18 | |
| Zinc | 6.5 | 5.0 | EPA 200.8 | 6-12-18 | 6-13-18 | |



Date of Report: July 5, 2018
 Samples Submitted: June 9, 2018
 Laboratory Reference: 1806-100
 Project: 14-05806-000

TOTAL METALS
EPA 200.8

Matrix: Water
 Units: ug/L (ppb)

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|-------------------|-----------------------|-----|-----------|---------------|---------------|-------|
| Client ID: | SEIMN-20180608 | | | | | |
| Laboratory ID: | 06-100-08 | | | | | |
| Copper | ND | 1.0 | EPA 200.8 | 6-12-18 | 6-13-18 | |
| Zinc | ND | 5.0 | EPA 200.8 | 6-12-18 | 6-13-18 | |

| | | | | | | |
|-------------------|-----------------------|-----|-----------|---------|---------|--|
| Client ID: | SEIMS-20180608 | | | | | |
| Laboratory ID: | 06-100-09 | | | | | |
| Copper | ND | 1.0 | EPA 200.8 | 6-12-18 | 6-13-18 | |
| Zinc | 9.6 | 5.0 | EPA 200.8 | 6-12-18 | 6-13-18 | |

| | | | | | | |
|-------------------|----------------------|-----|-----------|---------|---------|--|
| Client ID: | MONM-20180608 | | | | | |
| Laboratory ID: | 06-100-10 | | | | | |
| Copper | ND | 1.0 | EPA 200.8 | 6-12-18 | 6-13-18 | |
| Zinc | 7.5 | 5.0 | EPA 200.8 | 6-12-18 | 6-13-18 | |

| | | | | | | |
|-------------------|-----------------------|-----|-----------|---------|---------|--|
| Client ID: | TYLMI-20180608 | | | | | |
| Laboratory ID: | 06-100-11 | | | | | |
| Copper | 1.8 | 1.0 | EPA 200.8 | 6-12-18 | 6-13-18 | |
| Zinc | 25 | 5.0 | EPA 200.8 | 6-12-18 | 6-13-18 | |

| | | | | | | |
|-------------------|-----------------------|-----|-----------|---------|---------|--|
| Client ID: | TYLMO-20180608 | | | | | |
| Laboratory ID: | 06-100-12 | | | | | |
| Copper | 3.2 | 1.0 | EPA 200.8 | 6-12-18 | 6-13-18 | |
| Zinc | 17 | 5.0 | EPA 200.8 | 6-12-18 | 6-13-18 | |

| | | | | | | |
|-------------------|-----------------------|-----|-----------|---------|---------|--|
| Client ID: | TOSMI-20180608 | | | | | |
| Laboratory ID: | 06-100-13 | | | | | |
| Copper | 17 | 5.0 | EPA 200.8 | 6-12-18 | 6-13-18 | |
| Zinc | 210 | 25 | EPA 200.8 | 6-12-18 | 6-13-18 | |

| | | | | | | |
|-------------------|-----------------------|-----|-----------|---------|---------|--|
| Client ID: | TOSMO-20180608 | | | | | |
| Laboratory ID: | 06-100-14 | | | | | |
| Copper | 4.8 | 1.0 | EPA 200.8 | 6-12-18 | 6-13-18 | |
| Zinc | 44 | 5.0 | EPA 200.8 | 6-12-18 | 6-13-18 | |



Date of Report: July 5, 2018
Samples Submitted: June 9, 2018
Laboratory Reference: 1806-100
Project: 14-05806-000

TOTAL METALS
EPA 200.8

Matrix: Water
Units: ug/L (ppb)

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|-------------------|----------------------|------------|---------------|----------------------|----------------------|--------------|
| Client ID: | QASI-20180608 | | | | | |
| Laboratory ID: | 06-100-15 | | | | | |
| Copper | ND | 1.0 | EPA 200.8 | 6-12-18 | 6-13-18 | |
| Zinc | ND | 5.0 | EPA 200.8 | 6-12-18 | 6-13-18 | |



Date of Report: July 5, 2018
 Samples Submitted: June 9, 2018
 Laboratory Reference: 1806-100
 Project: 14-05806-000

**TOTAL METALS
 EPA 200.8
 QUALITY CONTROL**

Matrix: Water
 Units: ug/L (ppb)

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|---------------------|-----------|-----|-----------|---------------|---------------|-------|
| METHOD BLANK | | | | | | |
| Laboratory ID: | MB0612WH2 | | | | | |
| Copper | ND | 1.0 | EPA 200.8 | 6-12-18 | 6-13-18 | |
| Zinc | ND | 5.0 | EPA 200.8 | 6-12-18 | 6-13-18 | |

| Analyte | Result | | Spike Level | | Source Result | Percent Recovery | Recovery Limits | RPD | RPD Limit | Flags |
|------------------|-------------|-------------|-------------|----|---------------|------------------|-----------------|-----|-----------|-------|
| DUPLICATE | | | | | | | | | | |
| Laboratory ID: | 06-100-02 | | | | | | | | | |
| | ORIG | DUP | | | | | | | | |
| Copper | 2.08 | 1.88 | NA | NA | | NA | NA | 10 | 20 | |
| Zinc | 7.50 | 6.94 | NA | NA | | NA | NA | 8 | 20 | |

MATRIX SPIKES

| | | | | | | | | | | |
|----------------|-------------|-------------|-----|-----|------|------------|------------|--------|---|----|
| Laboratory ID: | 06-100-02 | | | | | | | | | |
| | MS | MSD | MS | MSD | | MS | MSD | | | |
| Copper | 89.4 | 86.6 | 100 | 100 | 2.08 | 87 | 85 | 75-125 | 3 | 20 |
| Zinc | 124 | 122 | 100 | 100 | 7.50 | 116 | 115 | 75-125 | 1 | 20 |



Date of Report: July 5, 2018
 Samples Submitted: June 9, 2018
 Laboratory Reference: 1806-100
 Project: 14-05806-000

**TOTAL SUSPENDED SOLIDS
 SM 2540D**

Matrix: Water
 Units: mg/L

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|------------------------|----------------------|-----|----------|---------------|---------------|-------|
| Client ID: | COLM-20180608 | | | | | |
| Laboratory ID: | 06-100-01 | | | | | |
| Total Suspended Solids | 2.4 | 1.0 | SM 2540D | 6-14-18 | 6-15-18 | |

| | | | | | | |
|------------------------|-----------------------|-----|----------|---------|---------|--|
| Client ID: | COUMI-20180608 | | | | | |
| Laboratory ID: | 06-100-02 | | | | | |
| Total Suspended Solids | 17 | 1.0 | SM 2540D | 6-14-18 | 6-15-18 | |

| | | | | | | |
|------------------------|-----------------------|-----|----------|---------|---------|--|
| Client ID: | COUMO-20180608 | | | | | |
| Laboratory ID: | 06-100-03 | | | | | |
| Total Suspended Solids | 11 | 1.0 | SM 2540D | 6-14-18 | 6-15-18 | |

| | | | | | | |
|------------------------|-----------------------|-----|----------|---------|---------|--|
| Client ID: | EVAMS-20180608 | | | | | |
| Laboratory ID: | 06-100-04 | | | | | |
| Total Suspended Solids | 10 | 1.0 | SM 2540D | 6-14-18 | 6-15-18 | |

| | | | | | | |
|------------------------|------------------------|-----|----------|---------|---------|--|
| Client ID: | EVALSS-20180608 | | | | | |
| Laboratory ID: | 06-100-05 | | | | | |
| Total Suspended Solids | 19 | 1.0 | SM 2540D | 6-14-18 | 6-15-18 | |

| | | | | | | |
|------------------------|-----------------------|-----|----------|---------|---------|--|
| Client ID: | MONMN-20180608 | | | | | |
| Laboratory ID: | 06-100-06 | | | | | |
| Total Suspended Solids | 5.6 | 1.0 | SM 2540D | 6-14-18 | 6-15-18 | |

| | | | | | | |
|------------------------|-----------------------|-----|----------|---------|---------|--|
| Client ID: | MONMS-20180608 | | | | | |
| Laboratory ID: | 06-100-07 | | | | | |
| Total Suspended Solids | 3.2 | 1.0 | SM 2540D | 6-14-18 | 6-15-18 | |



Date of Report: July 5, 2018
 Samples Submitted: June 9, 2018
 Laboratory Reference: 1806-100
 Project: 14-05806-000

**TOTAL SUSPENDED SOLIDS
SM 2540D**

Matrix: Water
 Units: mg/L

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|------------------------|-----------------------|-----|----------|---------------|---------------|-------|
| Client ID: | SEIMN-20180608 | | | | | |
| Laboratory ID: | 06-100-08 | | | | | |
| Total Suspended Solids | 10 | 1.0 | SM 2540D | 6-14-18 | 6-15-18 | |

| | | | | | | |
|------------------------|-----------------------|-----|----------|---------|---------|--|
| Client ID: | SEIMS-20180608 | | | | | |
| Laboratory ID: | 06-100-09 | | | | | |
| Total Suspended Solids | 20 | 1.0 | SM 2540D | 6-14-18 | 6-15-18 | |

| | | | | | | |
|------------------------|----------------------|-----|----------|---------|---------|--|
| Client ID: | MONM-20180608 | | | | | |
| Laboratory ID: | 06-100-10 | | | | | |
| Total Suspended Solids | 4.6 | 1.0 | SM 2540D | 6-14-18 | 6-15-18 | |

| | | | | | | |
|------------------------|-----------------------|-----|----------|---------|---------|--|
| Client ID: | TYLMI-20180608 | | | | | |
| Laboratory ID: | 06-100-11 | | | | | |
| Total Suspended Solids | 6.4 | 1.0 | SM 2540D | 6-14-18 | 6-15-18 | |

| | | | | | | |
|------------------------|-----------------------|-----|----------|---------|---------|--|
| Client ID: | TYLMO-20180608 | | | | | |
| Laboratory ID: | 06-100-12 | | | | | |
| Total Suspended Solids | 19 | 1.0 | SM 2540D | 6-14-18 | 6-15-18 | |

| | | | | | | |
|------------------------|-----------------------|-----|----------|---------|---------|--|
| Client ID: | TOSMI-20180608 | | | | | |
| Laboratory ID: | 06-100-13 | | | | | |
| Total Suspended Solids | 95 | 2.7 | SM 2540D | 6-14-18 | 6-15-18 | |

| | | | | | | |
|------------------------|-----------------------|-----|----------|---------|---------|--|
| Client ID: | TOSMO-20180608 | | | | | |
| Laboratory ID: | 06-100-14 | | | | | |
| Total Suspended Solids | 32 | 1.0 | SM 2540D | 6-14-18 | 6-15-18 | |



Date of Report: July 5, 2018
Samples Submitted: June 9, 2018
Laboratory Reference: 1806-100
Project: 14-05806-000

**TOTAL SUSPENDED SOLIDS
SM 2540D**

Matrix: Water
Units: mg/L

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|------------------------|----------------------|------------|---------------|----------------------|----------------------|--------------|
| Client ID: | QASI-20180608 | | | | | |
| Laboratory ID: | 06-100-15 | | | | | |
| Total Suspended Solids | 3.6 | 1.0 | SM 2540D | 6-14-18 | 6-15-18 | |



Date of Report: July 5, 2018
 Samples Submitted: June 9, 2018
 Laboratory Reference: 1806-100
 Project: 14-05806-000

**TOTAL SUSPENDED SOLIDS
 SM 2540D
 QUALITY CONTROL**

Matrix: Water
 Units: mg/L

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|------------------------|-----------|-----|----------|---------------|---------------|-------|
| METHOD BLANK | | | | | | |
| Laboratory ID: | MB0614W1 | | | | | |
| Total Suspended Solids | ND | 1.0 | SM 2540D | 6-14-18 | 6-15-18 | |

| Analyte | Result | Spike Level | Source Result | Percent Recovery | Recovery Limits | RPD | RPD Limit | Flags |
|------------------------|-------------|-------------|---------------|------------------|-----------------|-----|-----------|-------|
| DUPLICATE | | | | | | | | |
| Laboratory ID: | 06-100-05 | | | | | | | |
| | ORIG | DUP | | | | | | |
| Total Suspended Solids | 18.8 | 9.00 | NA | NA | NA | 71 | 17 | K |

| | | | | | | | | |
|------------------------|-------------|-----|----|----|--------|----|----|--|
| SPIKE BLANK | | | | | | | | |
| Laboratory ID: | SB0614W1 | | | | | | | |
| | SB | SB | | SB | | | | |
| Total Suspended Solids | 83.0 | 100 | NA | 83 | 79-116 | NA | NA | |



Date of Report: July 5, 2018
 Samples Submitted: June 9, 2018
 Laboratory Reference: 1806-100
 Project: 14-05806-000

TURBIDITY
EPA 180.1

Matrix: Water
 Units: NTU

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|-------------------|----------------------|------|-----------|---------------|---------------|-------|
| Client ID: | COLM-20180608 | | | | | |
| Laboratory ID: | 06-100-01 | | | | | |
| Turbidity | 2.0 | 0.10 | EPA 180.1 | 6-10-18 | 6-10-18 | |

| | | | | | | |
|-------------------|-----------------------|------|-----------|---------|---------|--|
| Client ID: | COUMI-20180608 | | | | | |
| Laboratory ID: | 06-100-02 | | | | | |
| Turbidity | 6.5 | 0.10 | EPA 180.1 | 6-10-18 | 6-10-18 | |

| | | | | | | |
|-------------------|-----------------------|------|-----------|---------|---------|--|
| Client ID: | COUMO-20180608 | | | | | |
| Laboratory ID: | 06-100-03 | | | | | |
| Turbidity | 6.6 | 0.10 | EPA 180.1 | 6-10-18 | 6-10-18 | |

| | | | | | | |
|-------------------|-----------------------|------|-----------|---------|---------|--|
| Client ID: | EVAMS-20180608 | | | | | |
| Laboratory ID: | 06-100-04 | | | | | |
| Turbidity | 3.7 | 0.10 | EPA 180.1 | 6-10-18 | 6-10-18 | |

| | | | | | | |
|-------------------|------------------------|------|-----------|---------|---------|--|
| Client ID: | EVALSS-20180608 | | | | | |
| Laboratory ID: | 06-100-05 | | | | | |
| Turbidity | 3.1 | 0.10 | EPA 180.1 | 6-10-18 | 6-10-18 | |

| | | | | | | |
|-------------------|-----------------------|------|-----------|---------|---------|--|
| Client ID: | MONMN-20180608 | | | | | |
| Laboratory ID: | 06-100-06 | | | | | |
| Turbidity | 3.1 | 0.10 | EPA 180.1 | 6-10-18 | 6-10-18 | |

| | | | | | | |
|-------------------|-----------------------|------|-----------|---------|---------|--|
| Client ID: | MONMS-20180608 | | | | | |
| Laboratory ID: | 06-100-07 | | | | | |
| Turbidity | 1.7 | 0.10 | EPA 180.1 | 6-10-18 | 6-10-18 | |



Date of Report: July 5, 2018
 Samples Submitted: June 9, 2018
 Laboratory Reference: 1806-100
 Project: 14-05806-000

TURBIDITY
EPA 180.1

Matrix: Water
 Units: NTU

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|-------------------|-----------------------|------|-----------|---------------|---------------|-------|
| Client ID: | SEIMN-20180608 | | | | | |
| Laboratory ID: | 06-100-08 | | | | | |
| Turbidity | 3.4 | 0.10 | EPA 180.1 | 6-10-18 | 6-10-18 | |

| | | | | | | |
|-------------------|-----------------------|------|-----------|---------|---------|--|
| Client ID: | SEIMS-20180608 | | | | | |
| Laboratory ID: | 06-100-09 | | | | | |
| Turbidity | 6.2 | 0.10 | EPA 180.1 | 6-10-18 | 6-10-18 | |

| | | | | | | |
|-------------------|----------------------|------|-----------|---------|---------|--|
| Client ID: | MONM-20180608 | | | | | |
| Laboratory ID: | 06-100-10 | | | | | |
| Turbidity | 2.4 | 0.10 | EPA 180.1 | 6-10-18 | 6-10-18 | |

| | | | | | | |
|-------------------|-----------------------|------|-----------|---------|---------|--|
| Client ID: | TYLMI-20180608 | | | | | |
| Laboratory ID: | 06-100-11 | | | | | |
| Turbidity | 3.4 | 0.10 | EPA 180.1 | 6-10-18 | 6-10-18 | |

| | | | | | | |
|-------------------|-----------------------|------|-----------|---------|---------|--|
| Client ID: | TYLMO-20180608 | | | | | |
| Laboratory ID: | 06-100-12 | | | | | |
| Turbidity | 12 | 0.10 | EPA 180.1 | 6-10-18 | 6-10-18 | |

| | | | | | | |
|-------------------|-----------------------|------|-----------|---------|---------|--|
| Client ID: | TOSMI-20180608 | | | | | |
| Laboratory ID: | 06-100-13 | | | | | |
| Turbidity | 67 | 0.10 | EPA 180.1 | 6-10-18 | 6-10-18 | |

| | | | | | | |
|-------------------|-----------------------|------|-----------|---------|---------|--|
| Client ID: | TOSMO-20180608 | | | | | |
| Laboratory ID: | 06-100-14 | | | | | |
| Turbidity | 21 | 0.10 | EPA 180.1 | 6-10-18 | 6-10-18 | |



Date of Report: July 5, 2018
Samples Submitted: June 9, 2018
Laboratory Reference: 1806-100
Project: 14-05806-000

TURBIDITY
EPA 180.1

Matrix: Water
Units: NTU

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|-------------------|----------------------|------------|---------------|----------------------|----------------------|--------------|
| Client ID: | QASI-20180608 | | | | | |
| Laboratory ID: | 06-100-15 | | | | | |
| Turbidity | 2.2 | 0.10 | EPA 180.1 | 6-10-18 | 6-10-18 | |



Date of Report: July 5, 2018
 Samples Submitted: June 9, 2018
 Laboratory Reference: 1806-100
 Project: 14-05806-000

**TURBIDITY
 EPA 180.1
 QUALITY CONTROL**

Matrix: Water
 Units: NTU

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|---------------------|-----------|------|-----------|---------------|---------------|-------|
| METHOD BLANK | | | | | | |
| Laboratory ID: | MB0610W1 | | | | | |
| Turbidity | ND | 0.10 | EPA 180.1 | 6-10-18 | 6-10-18 | |

| Analyte | Result | Spike Level | Source Result | Percent Recovery | Recovery Limits | RPD | RPD Limit | Flags |
|------------------|-------------|-------------|---------------|------------------|-----------------|-----|-----------|-------|
| DUPLICATE | | | | | | | | |
| Laboratory ID: | 06-100-01 | | | | | | | |
| | ORIG | DUP | | | | | | |
| Turbidity | 1.96 | 2.02 | NA | NA | NA | NA | 3 | 15 |



Date of Report: July 5, 2018
 Samples Submitted: June 9, 2018
 Laboratory Reference: 1806-100
 Project: 14-05806-000

HARDNESS
EPA 200.7/SM 2340B

Matrix: Water
 Units: mg eqt. CaCO₃/L (ppm)

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|-------------------|----------------------|-----|----------------|---------------|---------------|-------|
| Client ID: | COLM-20180608 | | | | | |
| Laboratory ID: | 06-100-01 | | | | | |
| Hardness | 14 | 1.0 | 200.7/SM 2340B | 6-18-18 | 6-18-18 | |

| | | | | | | |
|-------------------|-----------------------|-----|----------------|---------|---------|--|
| Client ID: | COUMI-20180608 | | | | | |
| Laboratory ID: | 06-100-02 | | | | | |
| Hardness | 150 | 1.0 | 200.7/SM 2340B | 6-18-18 | 6-18-18 | |

| | | | | | | |
|-------------------|-----------------------|-----|----------------|---------|---------|--|
| Client ID: | COUMO-20180608 | | | | | |
| Laboratory ID: | 06-100-03 | | | | | |
| Hardness | 120 | 1.0 | 200.7/SM 2340B | 6-18-18 | 6-18-18 | |

| | | | | | | |
|-------------------|-----------------------|-----|----------------|---------|---------|--|
| Client ID: | EVAMS-20180608 | | | | | |
| Laboratory ID: | 06-100-04 | | | | | |
| Hardness | 110 | 1.0 | 200.7/SM 2340B | 6-18-18 | 6-18-18 | |

| | | | | | | |
|-------------------|------------------------|-----|----------------|---------|---------|--|
| Client ID: | EVALSS-20180608 | | | | | |
| Laboratory ID: | 06-100-05 | | | | | |
| Hardness | 99 | 1.0 | 200.7/SM 2340B | 6-18-18 | 6-18-18 | |

| | | | | | | |
|-------------------|-----------------------|-----|----------------|---------|---------|--|
| Client ID: | MONMN-20180608 | | | | | |
| Laboratory ID: | 06-100-06 | | | | | |
| Hardness | 110 | 1.0 | 200.7/SM 2340B | 6-18-18 | 6-18-18 | |

| | | | | | | |
|-------------------|-----------------------|-----|----------------|---------|---------|--|
| Client ID: | MONMS-20180608 | | | | | |
| Laboratory ID: | 06-100-07 | | | | | |
| Hardness | 170 | 1.0 | 200.7/SM 2340B | 6-18-18 | 6-18-18 | |



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HARDNESS
EPA 200.7/SM 2340B

Matrix: Water
 Units: mg eqt. CaCO₃/L (ppm)

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|-------------------|-----------------------|-----|----------------|---------------|---------------|-------|
| Client ID: | SEIMN-20180608 | | | | | |
| Laboratory ID: | 06-100-08 | | | | | |
| Hardness | 45 | 1.0 | 200.7/SM 2340B | 6-18-18 | 6-18-18 | |

| | | | | | | |
|-------------------|-----------------------|-----|----------------|---------|---------|--|
| Client ID: | SEIMS-20180608 | | | | | |
| Laboratory ID: | 06-100-09 | | | | | |
| Hardness | 52 | 1.0 | 200.7/SM 2340B | 6-18-18 | 6-18-18 | |

| | | | | | | |
|-------------------|----------------------|-----|----------------|---------|---------|--|
| Client ID: | MONM-20180608 | | | | | |
| Laboratory ID: | 06-100-10 | | | | | |
| Hardness | 100 | 1.0 | 200.7/SM 2340B | 6-18-18 | 6-18-18 | |

| | | | | | | |
|-------------------|-----------------------|-----|----------------|---------|---------|--|
| Client ID: | TYLMI-20180608 | | | | | |
| Laboratory ID: | 06-100-11 | | | | | |
| Hardness | 110 | 1.0 | 200.7/SM 2340B | 6-18-18 | 6-18-18 | |

| | | | | | | |
|-------------------|-----------------------|-----|----------------|---------|---------|--|
| Client ID: | TYLMO-20180608 | | | | | |
| Laboratory ID: | 06-100-12 | | | | | |
| Hardness | 100 | 1.0 | 200.7/SM 2340B | 6-18-18 | 6-18-18 | |

| | | | | | | |
|-------------------|-----------------------|-----|----------------|---------|---------|--|
| Client ID: | TOSMI-20180608 | | | | | |
| Laboratory ID: | 06-100-13 | | | | | |
| Hardness | 130 | 1.0 | 200.7/SM 2340B | 6-18-18 | 6-18-18 | |

| | | | | | | |
|-------------------|-----------------------|-----|----------------|---------|---------|--|
| Client ID: | TOSMO-20180608 | | | | | |
| Laboratory ID: | 06-100-14 | | | | | |
| Hardness | 120 | 1.0 | 200.7/SM 2340B | 6-18-18 | 6-18-18 | |



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HARDNESS
EPA 200.7/SM 2340B

Matrix: Water
Units: mg eqt. CaCO₃/L (ppm)

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|-------------------|----------------------|------------|----------------|----------------------|----------------------|--------------|
| Client ID: | QASI-20180608 | | | | | |
| Laboratory ID: | 06-100-15 | | | | | |
| Hardness | 13 | 1.0 | 200.7/SM 2340B | 6-18-18 | 6-18-18 | |



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**HARDNESS
 EPA 200.7/SM 2340B
 QUALITY CONTROL**

Matrix: Water
 Units: mg eqt. CaCO₃/L (ppm)

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|---------------------|-----------|-----|----------------|---------------|---------------|-------|
| METHOD BLANK | | | | | | |
| Laboratory ID: | MB0618WH1 | | | | | |
| Hardness | ND | 1.0 | 200.7/SM 2340B | 6-18-18 | 6-18-18 | |

| Analyte | Result | Spike Level | Source Result | Percent Recovery | Recovery Limits | RPD | RPD Limit | Flags |
|------------------|-------------|-------------|---------------|------------------|-----------------|-----|-----------|-------|
| DUPLICATE | | | | | | | | |
| Laboratory ID: | 06-100-01 | | | | | | | |
| | ORIG | DUP | | | | | | |
| Hardness | 14.4 | 14.7 | NA | NA | NA | 2 | 20 | |

| Analyte | Result | Spike Level | Source Result | Percent Recovery | Recovery Limits | RPD | RPD Limit | Flags | | |
|----------------------|------------|-------------|---------------|------------------|-----------------|-----|-----------|--------|---|----|
| MATRIX SPIKES | | | | | | | | | | |
| Laboratory ID: | 06-100-01 | | | | | | | | | |
| | MS | MSD | MS | MSD | MS | MSD | | | | |
| Hardness | 156 | 157 | 132 | 132 | 14.4 | 107 | 108 | 75-125 | 1 | 20 |

| Analyte | Result | Spike Level | Source Result | Percent Recovery | Recovery Limits | RPD | RPD Limit | Flags |
|--------------------|------------|-------------|---------------|------------------|-----------------|-----|-----------|-------|
| SPIKE BLANK | | | | | | | | |
| Laboratory ID: | SB0618WH1 | | | | | | | |
| | SB | SB | SB | SB | SB | | | |
| Hardness | 141 | 132 | NA | 107 | 80-120 | NA | NA | |



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**DISSOLVED METALS
 EPA 200.8**

Matrix: Water
 Units: ug/L (ppb)

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|-------------------|----------------------|-----|-----------|---------------|---------------|-------|
| Client ID: | COLM-20180608 | | | | | |
| Laboratory ID: | 06-100-01 | | | | | |
| Copper | ND | 1.0 | EPA 200.8 | | 6-12-18 | |
| Zinc | ND | 5.0 | EPA 200.8 | | 6-12-18 | |

| | | | | | | |
|-------------------|-----------------------|-----|-----------|--|---------|--|
| Client ID: | COUMI-20180608 | | | | | |
| Laboratory ID: | 06-100-02 | | | | | |
| Copper | 1.1 | 1.0 | EPA 200.8 | | 6-12-18 | |
| Zinc | ND | 5.0 | EPA 200.8 | | 6-12-18 | |

| | | | | | | |
|-------------------|-----------------------|-----|-----------|--|---------|--|
| Client ID: | COUMO-20180608 | | | | | |
| Laboratory ID: | 06-100-03 | | | | | |
| Copper | 3.3 | 1.0 | EPA 200.8 | | 6-12-18 | |
| Zinc | 9.2 | 5.0 | EPA 200.8 | | 6-12-18 | |

| | | | | | | |
|-------------------|-----------------------|-----|-----------|--|---------|--|
| Client ID: | EVAMS-20180608 | | | | | |
| Laboratory ID: | 06-100-04 | | | | | |
| Copper | ND | 1.0 | EPA 200.8 | | 6-12-18 | |
| Zinc | ND | 5.0 | EPA 200.8 | | 6-12-18 | |

| | | | | | | |
|-------------------|------------------------|-----|-----------|--|---------|--|
| Client ID: | EVALSS-20180608 | | | | | |
| Laboratory ID: | 06-100-05 | | | | | |
| Copper | ND | 1.0 | EPA 200.8 | | 6-12-18 | |
| Zinc | ND | 5.0 | EPA 200.8 | | 6-12-18 | |

| | | | | | | |
|-------------------|-----------------------|-----|-----------|--|---------|--|
| Client ID: | MONMN-20180608 | | | | | |
| Laboratory ID: | 06-100-06 | | | | | |
| Copper | ND | 1.0 | EPA 200.8 | | 6-12-18 | |
| Zinc | ND | 5.0 | EPA 200.8 | | 6-12-18 | |

| | | | | | | |
|-------------------|-----------------------|-----|-----------|--|---------|--|
| Client ID: | MONMS-20180608 | | | | | |
| Laboratory ID: | 06-100-07 | | | | | |
| Copper | ND | 1.0 | EPA 200.8 | | 6-12-18 | |
| Zinc | ND | 5.0 | EPA 200.8 | | 6-12-18 | |



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 Project: 14-05806-000

**DISSOLVED METALS
 EPA 200.8**

Matrix: Water
 Units: ug/L (ppb)

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|-------------------|-----------------------|-----|-----------|---------------|---------------|-------|
| Client ID: | SEIMN-20180608 | | | | | |
| Laboratory ID: | 06-100-08 | | | | | |
| Copper | ND | 1.0 | EPA 200.8 | | 6-12-18 | |
| Zinc | ND | 5.0 | EPA 200.8 | | 6-12-18 | |

| | | | | | | |
|-------------------|-----------------------|-----|-----------|--|---------|--|
| Client ID: | SEIMS-20180608 | | | | | |
| Laboratory ID: | 06-100-09 | | | | | |
| Copper | ND | 1.0 | EPA 200.8 | | 6-12-18 | |
| Zinc | ND | 5.0 | EPA 200.8 | | 6-12-18 | |

| | | | | | | |
|-------------------|----------------------|-----|-----------|--|---------|--|
| Client ID: | MONM-20180608 | | | | | |
| Laboratory ID: | 06-100-10 | | | | | |
| Copper | ND | 1.0 | EPA 200.8 | | 6-12-18 | |
| Zinc | 5.7 | 5.0 | EPA 200.8 | | 6-12-18 | |

| | | | | | | |
|-------------------|-----------------------|-----|-----------|--|---------|--|
| Client ID: | TYLMI-20180608 | | | | | |
| Laboratory ID: | 06-100-11 | | | | | |
| Copper | 1.2 | 1.0 | EPA 200.8 | | 6-12-18 | |
| Zinc | 12 | 5.0 | EPA 200.8 | | 6-12-18 | |

| | | | | | | |
|-------------------|-----------------------|-----|-----------|--|---------|--|
| Client ID: | TYLMO-20180608 | | | | | |
| Laboratory ID: | 06-100-12 | | | | | |
| Copper | 2.2 | 1.0 | EPA 200.8 | | 6-12-18 | |
| Zinc | ND | 5.0 | EPA 200.8 | | 6-12-18 | |

| | | | | | | |
|-------------------|-----------------------|-----|-----------|--|---------|--|
| Client ID: | TOSMI-20180608 | | | | | |
| Laboratory ID: | 06-100-13 | | | | | |
| Copper | 6.4 | 1.0 | EPA 200.8 | | 6-12-18 | |
| Zinc | 17 | 5.0 | EPA 200.8 | | 6-12-18 | |

| | | | | | | |
|-------------------|-----------------------|-----|-----------|--|---------|--|
| Client ID: | TOSMO-20180608 | | | | | |
| Laboratory ID: | 06-100-14 | | | | | |
| Copper | 3.1 | 1.0 | EPA 200.8 | | 6-12-18 | |
| Zinc | 11 | 5.0 | EPA 200.8 | | 6-12-18 | |



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Project: 14-05806-000

DISSOLVED METALS
EPA 200.8

Matrix: Water
Units: ug/L (ppb)

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|-------------------|----------------------|------------|---------------|----------------------|----------------------|--------------|
| Client ID: | QASI-20180608 | | | | | |
| Laboratory ID: | 06-100-15 | | | | | |
| Copper | ND | 1.0 | EPA 200.8 | | 6-12-18 | |
| Zinc | ND | 5.0 | EPA 200.8 | | 6-12-18 | |



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**DISSOLVED METALS
 EPA 200.8
 QUALITY CONTROL**

Matrix: Water
 Units: ug/L (ppb)

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|---------------------|----------|-----|-----------|---------------|---------------|-------|
| METHOD BLANK | | | | | | |
| Laboratory ID: | MB0612D1 | | | | | |
| Copper | ND | 1.0 | EPA 200.8 | | 6-12-18 | |
| Zinc | ND | 5.0 | EPA 200.8 | | 6-12-18 | |

| Analyte | Result | Spike Level | Source Result | Percent Recovery | Recovery Limits | RPD | RPD Limit | Flags |
|------------------|-----------|-------------|---------------|------------------|-----------------|-----|-----------|-------|
| DUPLICATE | | | | | | | | |
| Laboratory ID: | 06-100-15 | | | | | | | |
| | ORIG | DUP | | | | | | |
| Copper | ND | ND | NA | NA | NA | NA | 20 | |
| Zinc | ND | ND | NA | NA | NA | NA | 20 | |

MATRIX SPIKES

| | | | | | | | | | | |
|----------------|-----------|------|------|------|----|-----|-----|--------|---|----|
| Laboratory ID: | 06-100-15 | | | | | | | | | |
| | MS | MSD | MS | MSD | | MS | MSD | | | |
| Copper | 74.0 | 75.6 | 80.0 | 80.0 | ND | 93 | 95 | 75-125 | 2 | 20 |
| Zinc | 83.0 | 83.2 | 80.0 | 80.0 | ND | 104 | 104 | 75-125 | 0 | 20 |



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 Project: 14-05806-000

**DISSOLVED ORGANIC CARBON
 SM 5310B**

Matrix: Water
 Units: mg/L

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|--------------------------|----------------------|-----|----------|---------------|---------------|-------|
| Client ID: | COLM-20180608 | | | | | |
| Laboratory ID: | 06-100-01 | | | | | |
| Dissolved Organic Carbon | 12 | 1.0 | SM 5310B | 6-13-18 | 6-13-18 | |

| | | | | | | |
|--------------------------|-----------------------|-----|----------|---------|---------|--|
| Client ID: | COUMI-20180608 | | | | | |
| Laboratory ID: | 06-100-02 | | | | | |
| Dissolved Organic Carbon | 3.7 | 1.0 | SM 5310B | 6-13-18 | 6-13-18 | |

| | | | | | | |
|--------------------------|-----------------------|-----|----------|---------|---------|--|
| Client ID: | COUMO-20180608 | | | | | |
| Laboratory ID: | 06-100-03 | | | | | |
| Dissolved Organic Carbon | 7.4 | 1.0 | SM 5310B | 6-13-18 | 6-13-18 | |

| | | | | | | |
|--------------------------|-----------------------|-----|----------|---------|---------|--|
| Client ID: | EVAMS-20180608 | | | | | |
| Laboratory ID: | 06-100-04 | | | | | |
| Dissolved Organic Carbon | 2.8 | 1.0 | SM 5310B | 6-13-18 | 6-13-18 | |

| | | | | | | |
|--------------------------|------------------------|-----|----------|---------|---------|--|
| Client ID: | EVALSS-20180608 | | | | | |
| Laboratory ID: | 06-100-05 | | | | | |
| Dissolved Organic Carbon | 2.4 | 1.0 | SM 5310B | 6-13-18 | 6-13-18 | |

| | | | | | | |
|--------------------------|-----------------------|-----|----------|---------|---------|--|
| Client ID: | MONMN-20180608 | | | | | |
| Laboratory ID: | 06-100-06 | | | | | |
| Dissolved Organic Carbon | 3.9 | 1.0 | SM 5310B | 6-13-18 | 6-13-18 | |

| | | | | | | |
|--------------------------|-----------------------|-----|----------|---------|---------|--|
| Client ID: | MONMS-20180608 | | | | | |
| Laboratory ID: | 06-100-07 | | | | | |
| Dissolved Organic Carbon | 3.4 | 1.0 | SM 5310B | 6-13-18 | 6-13-18 | |



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 Project: 14-05806-000

**DISSOLVED ORGANIC CARBON
 SM 5310B**

Matrix: Water
 Units: mg/L

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|--------------------------|-----------------------|-----|----------|---------------|---------------|-------|
| Client ID: | SEIMN-20180608 | | | | | |
| Laboratory ID: | 06-100-08 | | | | | |
| Dissolved Organic Carbon | 2.2 | 1.0 | SM 5310B | 6-13-18 | 6-13-18 | |
| Client ID: | SEIMS-20180608 | | | | | |
| Laboratory ID: | 06-100-09 | | | | | |
| Dissolved Organic Carbon | 3.6 | 1.0 | SM 5310B | 6-13-18 | 6-13-18 | |
| Client ID: | MONM-20180608 | | | | | |
| Laboratory ID: | 06-100-10 | | | | | |
| Dissolved Organic Carbon | 3.4 | 1.0 | SM 5310B | 6-13-18 | 6-13-18 | |
| Client ID: | TYLMI-20180608 | | | | | |
| Laboratory ID: | 06-100-11 | | | | | |
| Dissolved Organic Carbon | 2.8 | 1.0 | SM 5310B | 6-13-18 | 6-13-18 | |
| Client ID: | TYLMO-20180608 | | | | | |
| Laboratory ID: | 06-100-12 | | | | | |
| Dissolved Organic Carbon | 4.3 | 1.0 | SM 5310B | 6-13-18 | 6-13-18 | |
| Client ID: | TOSMI-20180608 | | | | | |
| Laboratory ID: | 06-100-13 | | | | | |
| Dissolved Organic Carbon | 15 | 1.0 | SM 5310B | 6-13-18 | 6-13-18 | |
| Client ID: | TOSMO-20180608 | | | | | |
| Laboratory ID: | 06-100-14 | | | | | |
| Dissolved Organic Carbon | 8.6 | 1.0 | SM 5310B | 6-13-18 | 6-13-18 | |



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**DISSOLVED ORGANIC CARBON
SM 5310B**

Matrix: Water
Units: mg/L

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|--------------------------|----------------------|------------|---------------|----------------------|----------------------|--------------|
| Client ID: | QASI-20180608 | | | | | |
| Laboratory ID: | 06-100-15 | | | | | |
| Dissolved Organic Carbon | 12 | 1.0 | SM 5310B | 6-13-18 | 6-13-18 | |



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**DISSOLVED ORGANIC CARBON
 SM 5310B
 QUALITY CONTROL**

Matrix: Water
 Units: mg/L

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|--------------------------|-----------|-----|----------|---------------|---------------|-------|
| METHOD BLANK | | | | | | |
| Laboratory ID: | MB0613D1 | | | | | |
| Dissolved Organic Carbon | ND | 1.0 | SM 5310B | 6-13-18 | 6-13-18 | |

| Analyte | Result | Spike Level | Source Result | Percent Recovery | Recovery Limits | RPD | RPD Limit | Flags |
|--------------------------|-------------|-------------|---------------|------------------|-----------------|-----|-----------|-------|
| DUPLICATE | | | | | | | | |
| Laboratory ID: | 06-100-02 | | | | | | | |
| | ORIG | DUP | | | | | | |
| Dissolved Organic Carbon | 3.65 | 3.62 | NA | NA | NA | 1 | 15 | |

MATRIX SPIKE

| | | | | | | | | |
|--------------------------|-------------|------|------|-----|--------|----|----|--|
| Laboratory ID: | 06-100-02 | | | | | | | |
| | MS | MS | | MS | | | | |
| Dissolved Organic Carbon | 14.2 | 10.0 | 3.65 | 106 | 75-125 | NA | NA | |

SPIKE BLANK

| | | | | | | | | |
|--------------------------|-------------|------|----|----|--------|----|----|--|
| Laboratory ID: | SB0613D1 | | | | | | | |
| | SB | SB | | SB | | | | |
| Dissolved Organic Carbon | 9.54 | 10.0 | NA | 95 | 80-120 | NA | NA | |



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TOTAL PHOSPHORUS
EPA 365.1

Matrix: Water
 Units: mg/L

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|-------------------|----------------------|-------|-----------|---------------|---------------|-------|
| Client ID: | COLM-20180608 | | | | | |
| Laboratory ID: | 06-100-01 | | | | | |
| Total Phosphorus | 0.037 | 0.010 | EPA 365.1 | 6-19-18 | 6-19-18 | |

| | | | | | | |
|-------------------|-----------------------|-------|-----------|---------|---------|--|
| Client ID: | COUMI-20180608 | | | | | |
| Laboratory ID: | 06-100-02 | | | | | |
| Total Phosphorus | 0.14 | 0.010 | EPA 365.1 | 6-19-18 | 6-19-18 | |

| | | | | | | |
|-------------------|-----------------------|-------|-----------|---------|---------|--|
| Client ID: | COUMO-20180608 | | | | | |
| Laboratory ID: | 06-100-03 | | | | | |
| Total Phosphorus | 0.13 | 0.010 | EPA 365.1 | 6-19-18 | 6-19-18 | |

| | | | | | | |
|-------------------|-----------------------|-------|-----------|---------|---------|--|
| Client ID: | EVAMS-20180608 | | | | | |
| Laboratory ID: | 06-100-04 | | | | | |
| Total Phosphorus | 0.036 | 0.010 | EPA 365.1 | 6-19-18 | 6-19-18 | |

| | | | | | | |
|-------------------|------------------------|-------|-----------|---------|---------|--|
| Client ID: | EVALSS-20180608 | | | | | |
| Laboratory ID: | 06-100-05 | | | | | |
| Total Phosphorus | 0.038 | 0.010 | EPA 365.1 | 6-19-18 | 6-19-18 | |

| | | | | | | |
|-------------------|-----------------------|-------|-----------|---------|---------|--|
| Client ID: | MONMN-20180608 | | | | | |
| Laboratory ID: | 06-100-06 | | | | | |
| Total Phosphorus | 0.073 | 0.010 | EPA 365.1 | 6-19-18 | 6-19-18 | |

| | | | | | | |
|-------------------|-----------------------|-------|-----------|---------|---------|--|
| Client ID: | MONMS-20180608 | | | | | |
| Laboratory ID: | 06-100-07 | | | | | |
| Total Phosphorus | 0.033 | 0.010 | EPA 365.1 | 6-19-18 | 6-19-18 | |



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TOTAL PHOSPHORUS
EPA 365.1

Matrix: Water
 Units: mg/L

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|-------------------|-----------------------|-------|-----------|---------------|---------------|-------|
| Client ID: | SEIMN-20180608 | | | | | |
| Laboratory ID: | 06-100-08 | | | | | |
| Total Phosphorus | 0.056 | 0.010 | EPA 365.1 | 6-19-18 | 6-19-18 | |

| | | | | | | |
|-------------------|-----------------------|-------|-----------|---------|---------|--|
| Client ID: | SEIMS-20180608 | | | | | |
| Laboratory ID: | 06-100-09 | | | | | |
| Total Phosphorus | 0.058 | 0.010 | EPA 365.1 | 6-19-18 | 6-19-18 | |

| | | | | | | |
|-------------------|----------------------|-------|-----------|---------|---------|--|
| Client ID: | MONM-20180608 | | | | | |
| Laboratory ID: | 06-100-10 | | | | | |
| Total Phosphorus | 0.051 | 0.010 | EPA 365.1 | 6-19-18 | 6-19-18 | |

| | | | | | | |
|-------------------|-----------------------|-------|-----------|---------|---------|--|
| Client ID: | TYLMI-20180608 | | | | | |
| Laboratory ID: | 06-100-11 | | | | | |
| Total Phosphorus | 0.047 | 0.010 | EPA 365.1 | 6-19-18 | 6-19-18 | |

| | | | | | | |
|-------------------|-----------------------|-------|-----------|---------|---------|--|
| Client ID: | TYLMO-20180608 | | | | | |
| Laboratory ID: | 06-100-12 | | | | | |
| Total Phosphorus | 0.099 | 0.010 | EPA 365.1 | 6-19-18 | 6-19-18 | |

| | | | | | | |
|-------------------|-----------------------|-------|-----------|---------|---------|--|
| Client ID: | TOSMI-20180608 | | | | | |
| Laboratory ID: | 06-100-13 | | | | | |
| Total Phosphorus | 0.23 | 0.010 | EPA 365.1 | 6-19-18 | 6-19-18 | |

| | | | | | | |
|-------------------|-----------------------|-------|-----------|---------|---------|--|
| Client ID: | TOSMO-20180608 | | | | | |
| Laboratory ID: | 06-100-14 | | | | | |
| Total Phosphorus | 0.12 | 0.010 | EPA 365.1 | 6-19-18 | 6-19-18 | |



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Samples Submitted: June 9, 2018
Laboratory Reference: 1806-100
Project: 14-05806-000

TOTAL PHOSPHORUS
EPA 365.1

Matrix: Water
Units: mg/L

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|-------------------|----------------------|------------|---------------|----------------------|----------------------|--------------|
| Client ID: | QASI-20180608 | | | | | |
| Laboratory ID: | 06-100-15 | | | | | |
| Total Phosphorus | 0.034 | 0.010 | EPA 365.1 | 6-19-18 | 6-19-18 | |



Date of Report: July 5, 2018
 Samples Submitted: June 9, 2018
 Laboratory Reference: 1806-100
 Project: 14-05806-000

**TOTAL PHOSPHORUS
 EPA 365.1
 QUALITY CONTROL**

Matrix: Water
 Units: mg/L

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|---------------------|-----------|-------|-----------|---------------|---------------|-------|
| METHOD BLANK | | | | | | |
| Laboratory ID: | MB0619W1 | | | | | |
| Total Phosphorus | ND | 0.010 | EPA 365.1 | 6-19-18 | 6-19-18 | |

| Analyte | Result | Spike Level | Source Result | Percent Recovery | Recovery Limits | RPD | RPD Limit | Flags |
|------------------|---------------|---------------|---------------|------------------|-----------------|-----|-----------|-------|
| DUPLICATE | | | | | | | | |
| Laboratory ID: | 06-100-01 | | | | | | | |
| | ORIG | DUP | | | | | | |
| Total Phosphorus | 0.0374 | 0.0381 | NA | NA | NA | 2 | 12 | |

| | | | | | | | | |
|---------------------|--------------|-------|--------|-----|--------|----|----|--|
| MATRIX SPIKE | | | | | | | | |
| Laboratory ID: | 06-100-01 | | | | | | | |
| | MS | MS | | MS | | | | |
| Total Phosphorus | 0.300 | 0.250 | 0.0374 | 105 | 86-114 | NA | NA | |

| | | | | | | | | |
|--------------------|--------------|-------|----|-----|--------|----|----|--|
| SPIKE BLANK | | | | | | | | |
| Laboratory ID: | SB0619W1 | | | | | | | |
| | SB | SB | | SB | | | | |
| Total Phosphorus | 0.252 | 0.250 | NA | 101 | 86-114 | NA | NA | |





Data Qualifiers and Abbreviations

- A - Due to a high sample concentration, the amount spiked is insufficient for meaningful MS/MSD recovery data.
 - B - The analyte indicated was also found in the blank sample.
 - C - The duplicate RPD is outside control limits due to high result variability when analyte concentrations are within five times the quantitation limit.
 - E - The value reported exceeds the quantitation range and is an estimate.
 - F - Surrogate recovery data is not available due to the high concentration of coeluting target compounds.
 - H - The analyte indicated is a common laboratory solvent and may have been introduced during sample preparation, and be impacting the sample result.
 - I - Compound recovery is outside of the control limits.
 - J - The value reported was below the practical quantitation limit. The value is an estimate.
 - K - Sample duplicate RPD is outside control limits due to sample inhomogeneity. The sample was re-extracted and re-analyzed with similar results.
 - L - The RPD is outside of the control limits.
 - M - Hydrocarbons in the gasoline range are impacting the diesel range result.
 - M1 - Hydrocarbons in the gasoline range (toluene-naphthalene) are present in the sample.
 - N - Hydrocarbons in the lube oil range are impacting the diesel range result.
 - N1 - Hydrocarbons in diesel range are impacting lube oil range results.
 - O - Hydrocarbons indicative of heavier fuels are present in the sample and are impacting the gasoline result.
 - P - The RPD of the detected concentrations between the two columns is greater than 40.
 - Q - Surrogate recovery is outside of the control limits.
 - S - Surrogate recovery data is not available due to the necessary dilution of the sample.
 - T - The sample chromatogram is not similar to a typical _____.
 - U - The analyte was analyzed for, but was not detected above the reported sample quantitation limit.
 - U1 - The practical quantitation limit is elevated due to interferences present in the sample.
 - V - Matrix Spike/Matrix Spike Duplicate recoveries are outside control limits due to matrix effects.
 - W - Matrix Spike/Matrix Spike Duplicate RPD are outside control limits due to matrix effects.
 - X - Sample extract treated with a mercury cleanup procedure.
 - X1 - Sample extract treated with a sulfuric acid/silica gel cleanup procedure.
 - Y - The calibration verification for this analyte exceeded the 20% drift specified in method 8260C, and therefore the reported result should be considered an estimate. The overall performance of the calibration verification standard met the acceptance criteria of the method.
 - Z -
- ND - Not Detected at PQL
 PQL - Practical Quantitation Limit
 RPD - Relative Percent Difference





Am Test Inc.
13600 NE 126TH PL
Suite C
Kirkland, WA 98034
(425) 885-1664

**Professional
Analytical
Services**

Jul 5 2018
On-Site Environmental
14648 NE 95th ST
Redmond, WA 98052
Attention: David Baumeister

Dear David Baumeister:

Enclosed please find the analytical data for your REDMOND PAIRED WATERSHED STUDY project.

The following is a cross correlation of client and laboratory identifications for your convenience.

| CLIENT ID | MATRIX | AMTEST ID | TEST |
|-----------------|--------|------------|------------|
| COLM-20180608 | Water | 18-A009749 | Micro, NUT |
| COLUMI-20180608 | Water | 18-A009750 | Micro, NUT |
| COUMO-20180608 | Water | 18-A009751 | Micro, NUT |
| EVAMS-20180608 | Water | 18-A009752 | Micro, NUT |
| EVALSS-20180608 | Water | 18-A009753 | Micro, NUT |
| MONMN-20180608 | Water | 18-A009754 | Micro, NUT |
| MONMS-20180608 | Water | 18-A009755 | Micro, NUT |
| MONM-20180608 | Water | 18-A009756 | Micro, NUT |
| SEIMN-20180608 | Water | 18-A009757 | Micro, NUT |
| SEIMS-20180608 | Water | 18-A009758 | Micro, NUT |
| TYLMI-20180608 | Water | 18-A009759 | Micro, NUT |
| TYLMO-20180608 | Water | 18-A009760 | Micro, NUT |
| TOSMI-20180608 | Water | 18-A009761 | Micro, NUT |
| TOSMO-20180608 | Water | 18-A009762 | Micro, NUT |
| QA51-20180608 | Water | 18-A009763 | Micro, NUT |

Your samples were received on Monday, June 11, 2018. At the time of receipt, the samples were logged in and properly maintained prior to the subsequent analysis.

The analytical procedures used at AmTest are well documented and are typically derived from the protocols of the EPA, USDA, FDA or the Army Corps of Engineers.

Following the analytical data you will find the Quality Control (QC) results.

Please note that the detection limits that are listed in the body of the report refer to the Practical Quantitation Limits (PQL's), as opposed to the Method Detection Limits (MDL's).

Am Test Inc.
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Kirkland, WA 98034
(425) 885-1664

**Professional
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Services**

Jul 5 2018
On-Site Environmental
continued . . .

If you should have any questions pertaining to the data package, please feel free to contact me.

Sincerely,


Aaron W. Young
Laboratory Manager

Project #: 14-05806-000
PO Number: 06-100

BACT = Bacteriological
CONV = Conventional

MET = Metals
ORG = Organics

NUT=Nutrients
DEM=Demand

MIN=Minerals

Am Test Inc.
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Services*

ANALYSIS REPORT

On-Site Environmental
14648 NE 95th ST
Redmond, WA 98052
Attention: David Baumeister
Project Name: REDMOND PAIRED WATERSHED STUDY
Project #: 14-05806-000
PO Number: 06-100
All results reported on an as received basis.

Date Received: 06/11/18
Date Reported: 7/ 5/18

AMTEST Identification Number 18-A009749
Client Identification COLM-20180608
Sampling Date 06/08/18, 16:40

Results

| PARAMETER | RESULT | UNITS | Q | D.L. | METHOD | ANALYST | DATE |
|--------------------------|--------|------------|---|------|-----------|---------|----------|
| Fecal Coliform | 18. | CFU/100 ml | | 1 | SM 9222D | NG | 06/11/18 |
| Total Nitrogen (NOX&TKN) | 2.73 | mg/l | | 0.1 | | | |
| Total Nitrogen (TKN) | 2.60 | mg/l | | 0.1 | SM4500N | JC | 06/22/18 |
| Total Nitrate + Nitrite | 0.13 | mg/l | | 0.01 | SM4500NO3 | JC | 06/15/18 |

AMTEST Identification Number **18-A009750**
Client Identification **COUMI-20180608**
Sampling Date **06/08/18, 15:55**

Results

| PARAMETER | RESULT | UNITS | Q | D.L. | METHOD | ANALYST | DATE |
|--------------------------|--------|------------|---|------|-----------|---------|----------|
| Fecal Coliform | 750 | CFU/100 ml | | 1 | SM 9222D | NG | 06/11/18 |
| Total Nitrogen (NOX&TKN) | 0.79 | mg/l | | 0.1 | | | |
| Total Nitrogen (TKN) | 0.362 | mg/l | | 0.1 | SM4500N | JC | 06/22/18 |
| Total Nitrate + Nitrite | 0.43 | mg/l | | 0.01 | SM4500NO3 | JC | 06/15/18 |

AMTEST Identification Number **18-A009751**
Client Identification **COUMO-20180608**
Sampling Date **06/08/18, 15:25**

Results

| PARAMETER | RESULT | UNITS | Q | D.L. | METHOD | ANALYST | DATE |
|--------------------------|--------|------------|---|------|-----------|---------|----------|
| Fecal Coliform | 1300 | CFU/100 ml | | 1 | SM 9222D | NG | 06/11/18 |
| Total Nitrogen (NOX&TKN) | 0.97 | mg/l | | 0.1 | | | |
| Total Nitrogen (TKN) | 0.448 | mg/l | | 0.1 | SM4500N | JC | 06/22/18 |
| Total Nitrate + Nitrite | 0.52 | mg/l | | 0.01 | SM4500NO3 | JC | 06/15/18 |

AMTEST Identification Number **18-A009752**
Client Identification **EVAMS-20180608**
Sampling Date **06/08/18, 15:45**

Results

| PARAMETER | RESULT | UNITS | Q | D.L. | METHOD | ANALYST | DATE |
|--------------------------|--------|------------|---|------|-----------|---------|----------|
| Fecal Coliform | 92. | CFU/100 ml | | 1 | SM 9222D | NG | 06/11/18 |
| Total Nitrogen (NOX&TKN) | 2.23 | mg/l | | 0.1 | | | |
| Total Nitrogen (TKN) | 0.331 | mg/l | | 0.1 | SM4500N | JC | 06/22/18 |
| Total Nitrate + Nitrite | 1.9 | mg/l | | 0.01 | SM4500NO3 | JC | 06/15/18 |

AMTEST Identification Number **18-A009753**
Client Identification **EVALSS-20180608**
Sampling Date **06/08/18, 16:06**

Results

| PARAMETER | RESULT | UNITS | Q | D.L. | METHOD | ANALYST | DATE |
|--------------------------|--------|------------|---|------|-----------|---------|----------|
| Fecal Coliform | 98. | CFU/100 ml | | 1 | SM 9222D | NG | 06/11/18 |
| Total Nitrogen (NOX&TKN) | 1.64 | mg/l | | 0.1 | | | |
| Total Nitrogen (TKN) | 0.236 | mg/l | | 0.1 | SM4500N | JC | 06/22/18 |
| Total Nitrate + Nitrite | 1.4 | mg/l | | 0.01 | SM4500NO3 | JC | 06/15/18 |

AMTEST Identification Number **18-A009754**
Client Identification **MONMN-20180608**
Sampling Date **06/08/18, 18:30**

Results

| PARAMETER | RESULT | UNITS | Q | D.L. | METHOD | ANALYST | DATE |
|--------------------------|--------|------------|---|------|-----------|---------|----------|
| Fecal Coliform | 360 | CFU/100 ml | | 1 | SM 9222D | NG | 06/11/18 |
| Total Nitrogen (NOX&TKN) | 0.50 | mg/l | | 0.1 | | | |
| Total Nitrogen (TKN) | 0.217 | mg/l | | 0.1 | SM4500N | JC | 06/22/18 |
| Total Nitrate + Nitrite | 0.28 | mg/l | | 0.01 | SM4500NO3 | JC | 06/15/18 |

AMTEST Identification Number **18-A009755**
Client Identification **MONMS-20180608**
Sampling Date **06/08/18, 18:50**

Results

| PARAMETER | RESULT | UNITS | Q | D.L. | METHOD | ANALYST | DATE |
|--------------------------|--------|------------|---|------|-----------|---------|----------|
| Fecal Coliform | 30. | CFU/100 ml | | 1 | SM 9222D | NG | 06/11/18 |
| Total Nitrogen (NOX&TKN) | 0.37 | mg/l | | 0.1 | | | |
| Total Nitrogen (TKN) | 0.143 | mg/l | | 0.1 | SM4500N | JC | 07/03/18 |
| Total Nitrate + Nitrite | 0.23 | mg/l | | 0.01 | SM4500NO3 | JC | 06/15/18 |

AMTEST Identification Number **18-A009756**
Client Identification **MONM-20180608**
Sampling Date **06/08/18, 17:20**

Results

| PARAMETER | RESULT | UNITS | Q | D.L. | METHOD | ANALYST | DATE |
|--------------------------|--------|------------|---|------|-----------|---------|----------|
| Fecal Coliform | 420 | CFU/100 ml | | 1 | SM 9222D | NG | 06/11/18 |
| Total Nitrogen (NOX&TKN) | 0.56 | mg/l | | 0.1 | | | |
| Total Nitrogen (TKN) | 0.283 | mg/l | | 0.1 | SM4500N | JC | 07/03/18 |
| Total Nitrate + Nitrite | 0.28 | mg/l | | 0.01 | SM4500NO3 | JC | 06/15/18 |

AMTEST Identification Number **18-A009757**
Client Identification **SEIMN-20180608**
Sampling Date **06/08/18, 18:20**

Results

| PARAMETER | RESULT | UNITS | Q | D.L. | METHOD | ANALYST | DATE |
|--------------------------|--------|------------|---|------|-----------|---------|----------|
| Fecal Coliform | 150 | CFU/100 ml | | 1 | SM 9222D | NG | 06/11/18 |
| Total Nitrogen (NOX&TKN) | 0.72 | mg/l | | 0.1 | | | |
| Total Nitrogen (TKN) | 0.191 | mg/l | | 0.1 | SM4500N | JC | 07/03/18 |
| Total Nitrate + Nitrite | 0.53 | mg/l | | 0.01 | SM4500NO3 | JC | 06/15/18 |

AMTEST Identification Number **18-A009758**
Client Identification **SEIMS-20180608**
Sampling Date **06/08/18, 18:40**

Results

| PARAMETER | RESULT | UNITS | Q | D.L. | METHOD | ANALYST | DATE |
|--------------------------|--------|------------|---|------|-----------|---------|----------|
| Fecal Coliform | 140 | CFU/100 ml | | 1 | SM 9222D | NG | 06/11/18 |
| Total Nitrogen (NOX&TKN) | 0.65 | mg/l | | 0.1 | | | |
| Total Nitrogen (TKN) | 0.388 | mg/l | | 0.1 | SM4500N | JC | 07/03/18 |
| Total Nitrate + Nitrite | 0.26 | mg/l | | 0.01 | SM4500NO3 | JC | 06/15/18 |

AMTEST Identification Number **18-A009759**
Client Identification **TYLMI-20180608**
Sampling Date **06/08/18, 17:40**

Results

| PARAMETER | RESULT | UNITS | Q | D.L. | METHOD | ANALYST | DATE |
|--------------------------|--------|------------|---|------|-----------|---------|----------|
| Fecal Coliform | 74. | CFU/100 ml | | 1 | SM 9222D | NG | 06/11/18 |
| Total Nitrogen (NOX&TKN) | 1.44 | mg/l | | 0.1 | | | |
| Total Nitrogen (TKN) | 0.337 | mg/l | | 0.1 | SM4500N | JC | 07/03/18 |
| Total Nitrate + Nitrite | 1.1 | mg/l | | 0.01 | SM4500NO3 | JC | 06/15/18 |

AMTEST Identification Number **18-A009760**
Client Identification **TYLMO-20180608**
Sampling Date **06/08/18, 17:10**

Results

| PARAMETER | RESULT | UNITS | Q | D.L. | METHOD | ANALYST | DATE |
|--------------------------|--------|------------|---|------|-----------|---------|----------|
| Fecal Coliform | 2400 | CFU/100 ml | | 1 | SM 9222D | NG | 06/11/18 |
| Total Nitrogen (NOX&TKN) | 1.01 | mg/l | | 0.1 | | | |
| Total Nitrogen (TKN) | 0.553 | mg/l | | 0.1 | SM4500N | JC | 07/03/18 |
| Total Nitrate + Nitrite | 0.46 | mg/l | | 0.01 | SM4500NO3 | JC | 06/15/18 |

AMTEST Identification Number **18-A009761**
Client Identification **TOSMI-20180608**
Sampling Date **06/08/18, 15:10**

Results

| PARAMETER | RESULT | UNITS | Q | D.L. | METHOD | ANALYST | DATE |
|--------------------------|--------|------------|---|------|-----------|---------|----------|
| Fecal Coliform | 1800 | CFU/100 ml | | 1 | SM 9222D | NG | 06/11/18 |
| Total Nitrogen (NOX&TKN) | 2.33 | mg/l | | 0.1 | | | |
| Total Nitrogen (TKN) | 1.50 | mg/l | | 0.1 | SM4500N | JC | 07/03/18 |
| Total Nitrate + Nitrite | 0.83 | mg/l | | 0.01 | SM4500NO3 | JC | 06/15/18 |

AMTEST Identification Number **18-A009762**
Client Identification **TOSMO-20180608**
Sampling Date **06/08/18, 16:30**


Results

| PARAMETER | RESULT | UNITS | Q | D.L. | METHOD | ANALYST | DATE |
|--------------------------|--------|------------|---|------|-----------|---------|----------|
| Fecal Coliform | 1300 | CFU/100 ml | | 1 | SM 9222D | NG | 06/11/18 |
| Total Nitrogen (NOX&TKN) | 1.39 | mg/l | | 0.1 | | | |
| Total Nitrogen (TKN) | 0.738 | mg/l | | 0.1 | SM4500N | JC | 07/03/18 |
| Total Nitrate + Nitrite | 0.65 | mg/l | | 0.01 | SM4500NO3 | JC | 06/15/18 |

AMTEST Identification Number **18-A009763**
Client Identification **QA51-20180608**
Sampling Date **06/08/18, 16:50**

Results

| PARAMETER | RESULT | UNITS | Q | D.L. | METHOD | ANALYST | DATE |
|--------------------------|--------|------------|---|------|-----------|---------|----------|
| Fecal Coliform | 25. | CFU/100 ml | | 1 | SM 9222D | NG | 06/11/18 |
| Total Nitrogen (NOX&TKN) | 0.66 | mg/l | | 0.1 | | | |
| Total Nitrogen (TKN) | 0.549 | mg/l | | 0.1 | SM4500N | JC | 07/03/18 |
| Total Nitrate + Nitrite | 0.11 | mg/l | | 0.01 | SM4500NO3 | JC | 06/15/18 |


Aaron W. Young
Laboratory Manager

QC Summary for sample numbers: 18-A009749 to 18-A009763

DUPLICATES

| SAMPLE # | ANALYTE | UNITS | SAMPLE VALUE | DUP VALUE | RPD |
|------------|-------------------------|------------|--------------|-----------|------|
| 18-A009749 | Fecal Coliform | CFU/100 ml | 18. | 25. | 33. |
| 18-A009763 | Fecal Coliform | CFU/100 ml | 25. | 27. | 7.7 |
| 18-A009567 | Total Nitrogen (TKN) | mg/l | < 0.1 | < 0.1 | |
| 18-A009670 | Total Nitrogen (TKN) | mg/l | 1.10 | 1.20 | 8.7 |
| 18-A009690 | Total Nitrogen (TKN) | mg/l | 0.811 | 0.816 | 0.61 |
| 18-A009754 | Total Nitrogen (TKN) | mg/l | 0.217 | 0.224 | 3.2 |
| 18-A009765 | Total Nitrogen (TKN) | mg/l | 0.108 | < 0.1 | |
| 18-A010041 | Total Nitrogen (TKN) | mg/l | < 0.1 | < 0.1 | |
| 18-A010811 | Total Nitrogen (TKN) | mg/l | < 0.1 | < 0.1 | |
| 18-A008426 | Total Nitrate + Nitrite | mg/l | < 0.01 | < 0.01 | |
| 18-A008428 | Total Nitrate + Nitrite | mg/l | 0.33 | 0.34 | 3.0 |
| 18-A009477 | Total Nitrate + Nitrite | mg/l | 0.27 | 0.26 | 3.8 |
| 18-A009522 | Total Nitrate + Nitrite | mg/l | 0.23 | 0.22 | 4.4 |
| 18-A009671 | Total Nitrate + Nitrite | mg/l | 1.7 | 1.8 | 5.7 |
| 18-A009748 | Total Nitrate + Nitrite | mg/l | 1.6 | 1.6 | 0.00 |
| 18-A009763 | Total Nitrate + Nitrite | mg/l | 0.11 | 0.12 | 8.7 |
| 18-A009962 | Total Nitrate + Nitrite | mg/l | 0.19 | 0.18 | 5.4 |
| 18-A010148 | Total Nitrate + Nitrite | mg/l | 0.39 | 0.39 | 0.00 |

MATRIX SPIKES

| SAMPLE # | ANALYTE | UNITS | SAMPLE VALUE | SMPL+ SPK | SPK AMT | RECOVERY |
|------------|-------------------------|-------|--------------|-----------|---------|----------|
| 18-A009567 | Total Nitrogen (TKN) | mg/l | < 0.1 | 0.790 | 1.00 | 79.00 % |
| 18-A009670 | Total Nitrogen (TKN) | mg/l | 1.10 | 2.00 | 1.00 | 90.00 % |
| 18-A009690 | Total Nitrogen (TKN) | mg/l | 0.811 | 1.66 | 1.00 | 84.90 % |
| 18-A009754 | Total Nitrogen (TKN) | mg/l | 0.217 | 1.10 | 1.00 | 88.30 % |
| 18-A009765 | Total Nitrogen (TKN) | mg/l | 0.108 | 1.11 | 1.00 | 100.20 % |
| 18-A010041 | Total Nitrogen (TKN) | mg/l | < 0.1 | 1.10 | 1.00 | 110.00 % |
| 18-A010811 | Total Nitrogen (TKN) | mg/l | < 0.1 | 1.03 | 1.00 | 103.00 % |
| 18-A008426 | Total Nitrate + Nitrite | mg/l | < 0.01 | 0.93 | 1.0 | 93.00 % |
| 18-A008428 | Total Nitrate + Nitrite | mg/l | 0.33 | 1.3 | 1.0 | 97.00 % |
| 18-A009477 | Total Nitrate + Nitrite | mg/l | 0.27 | 1.2 | 1.0 | 93.00 % |
| 18-A009522 | Total Nitrate + Nitrite | mg/l | 0.23 | 1.1 | 1.0 | 87.00 % |
| 18-A009671 | Total Nitrate + Nitrite | mg/l | 1.7 | 2.7 | 1.0 | 100.00 % |
| 18-A009748 | Total Nitrate + Nitrite | mg/l | 1.6 | 2.6 | 1.0 | 100.00 % |
| 18-A009763 | Total Nitrate + Nitrite | mg/l | 0.11 | 1.9 | 2.0 | 89.50 % |
| 18-A009962 | Total Nitrate + Nitrite | mg/l | 0.19 | 1.1 | 1.0 | 91.00 % |
| 18-A010148 | Total Nitrate + Nitrite | mg/l | 0.39 | 1.4 | 1.0 | 101.00 % |

QC Summary for sample numbers: 18-A009749 to 18-A009763...

STANDARD REFERENCE MATERIALS

| ANALYTE | UNITS | TRUE VALUE | MEASURED VALUE | RECOVERY |
|-------------------------|-------|------------|----------------|----------|
| Total Nitrogen (TKN) | mg/l | 1.00 | 0.915 | 91.5 % |
| Total Nitrogen (TKN) | mg/l | 1.00 | 0.905 | 90.5 % |
| Total Nitrogen (TKN) | mg/l | 1.00 | 0.907 | 90.7 % |
| Total Nitrogen (TKN) | mg/l | 1.00 | 0.997 | 99.7 % |
| Total Nitrogen (TKN) | mg/l | 1.00 | 1.03 | 103. % |
| Total Nitrate + Nitrite | mg/l | 1.0 | 0.90 | 90.0 % |
| Total Nitrate + Nitrite | mg/l | 1.0 | 0.99 | 99.0 % |
| Total Nitrate + Nitrite | mg/l | 1.0 | 0.94 | 94.0 % |
| Total Nitrate + Nitrite | mg/l | 1.0 | 0.95 | 95.0 % |
| Total Nitrate + Nitrite | mg/l | 1.0 | 0.95 | 95.0 % |

BLANKS

| ANALYTE | UNITS | RESULT |
|-------------------------|------------|--------|
| Fecal Coliform | CFU/100 ml | < 1 |
| Fecal Coliform | CFU/100 ml | < 1 |
| Total Nitrogen (TKN) | mg/l | < 0.1 |
| Total Nitrogen (TKN) | mg/l | < 0.1 |
| Total Nitrogen (TKN) | mg/l | < 0.1 |
| Total Nitrogen (TKN) | mg/l | < 0.1 |
| Total Nitrogen (TKN) | mg/l | < 0.1 |
| Total Nitrate + Nitrite | mg/l | < 0.01 |
| Total Nitrate + Nitrite | mg/l | < 0.01 |
| Total Nitrate + Nitrite | mg/l | < 0.01 |
| Total Nitrate + Nitrite | mg/l | < 0.01 |
| Total Nitrate + Nitrite | mg/l | < 0.01 |



14648 NE 95th Street, Redmond, WA 98052 · (425) 883-3881

Laboratory: AmTest Laboratories

Attention: Aaron Young

13600 NE 126th PI Kirkland, WA 98034

Phone Number: (425) 885-1664

Turnaround Request

1 Day 2 Day 3 Day

Standard

Other: _____

Laboratory Reference #: 06-100

Project Manager: Blair Goodrow

email: bgoodrow@onsite-env.com

Project Number: 14-05806-000

Project Name: Redmond Paired Watershed Study

| Lab ID | Sample Identification | Date Sampled | Time Sampled | Matrix | # of Cont. | Requested Analyses |
|--------------------------------------|----------------------------------|---------------------|--------------|----------------|--------------|--|
| 1 | COLM-20180521 <i>0608 9749</i> | 6/8/18 | 16:40 | Water | 2 | Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N |
| 2 | COUMI-20180521 <i>50</i> | 6/8/18 | 15:55 | Water | 2 | Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N |
| 3 | COUMO-20180521 <i>M 51</i> | 6/8/18 | 15:25 | Water | 2 | Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N |
| 4 | EVAMS-20180521 <i>6/12/18 52</i> | 6/8/18 | 15:45 | Water | 2 | Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N |
| 5 | EVALSS-20180521 <i>53</i> | 6/8/18 | 16:06 | Water | 2 | Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N |
| 6 | MONMN-20180521 <i>54</i> | 6/8/18 | 18:30 | Water | 2 | Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N |
| 7 | MONMS-20180521 <i>55</i> | 6/8/18 | 18:50 | Water | 2 | Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N |
| 8 | MONM-20180521 <i>56</i> | 6/8/18 | 17:20 | Water | 2 | Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N |
| 9 | SEIMN-20180521 <i>57</i> | 6/8/18 | 18:20 | Water | 2 | Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N |
| 10 | SEIMS-20180521 <i>58</i> | 6/8/18 | 18:40 | Water | 2 | Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N |
| Signature | | Company | | Date | Time | Comments/Special Instructions |
| Relinquished by: <i>Walter Leary</i> | | <i>OSE</i> | | <i>6/11/18</i> | <i>10:00</i> | |
| Received by: <i>Anna Steub</i> | | <i>AMTEST T=4.7</i> | | <i>6/11/18</i> | <i>10:00</i> | |
| Relinquished by: | | | | | | |
| Received by: | | | | | | |
| Relinquished by: | | | | | | EDDs - CSV Reporting Limits: Fecal Coliform - 1.0 cfu/100ml Total Nitrogen - .10 mg/L |
| Received by: | | | | | | |



OnSite Environmental Inc.
Analytical Laboratory Testing Services
14648 NE 95th Street • Redmond, WA 98052
Phone: (425) 883-3881 • www.onsite-env.com

Chain of Custody

Company: Herrera
 Project Number: 14-05806-000
 Project Name: RPWS
 Project Manager: John Lenth
 Sampled by: Brianna Bleud

Turnaround Request (in working days)
 (Check One)
 Same Day 1 Day
 2 Days 3 Days
 Standard (7 Days)
 (TPH analysis 5 Days)
 _____ (other)

Laboratory Number: 06-100

| Lab ID | Sample Identification | Date Sampled | Time Sampled | Matrix | Number of Containers |
|--------|-----------------------|--------------|--------------|--------|----------------------|
| 1 | COLM-20180608 | 6.8.18 | 1640 | Water | 7 |
| 2 | LOUMI-20180608 | | 1555 | | |
| 3 | COUMD-20180608 | | 1525 | | |
| 4 | EVAMS-20180608 | | 1545 | | |
| 5 | EVALSS-20180608 | | 1605 | | |
| 6 | MONMN-20180608 | | 1830 | | |
| 7 | MONMS-20180608 | | 1850 | | |
| 8 | SEIMN-20180608 | | 1720 | | |
| 9 | SEIMS-20180608 | | 1820 | | |
| 10 | MONM-20180608 | | 1840 | | |

| NWTPH-HCID | NWTPH-Gx/BTEX | NWTPH-Gx | NWTPH-Dx (Acid / SG Clean-up) | Volatiles 8260C | Halogenated Volatiles 8260C | EDB EPA 8011 (Waters Only) | Semivolatiles 8270D/SIM (with low-level PAHs) | PAHs 8270D/SIM (low-level) | PCBs 8082A | Organochlorine Pesticides 8081B | Organophosphorus Pesticides 8270D/SIM | Chlorinated Acid Herbicides 8151A | Total PCRA Metals Cu Zn | Total MTCA Metals | TCLP Metals | HEM (oil and grease) 1664A | TSS, Turbidity, hardness | Dissolved Cu + Zn | Dissolved Organic Carbon | Total phosphorus | % Moisture fecal C, Total N |
|------------|---------------|----------|-------------------------------|-----------------|-----------------------------|----------------------------|---|----------------------------|------------|---------------------------------|---------------------------------------|-----------------------------------|-------------------------|-------------------|-------------|----------------------------|--------------------------|-------------------|--------------------------|------------------|-----------------------------|
| | | | | | | | | | | | | | X | | | | X | X | X | X | X |
| | | | | | | | | | | | | | | | | | | | | | |
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| | | | | | | | | | | | | | | | | | | | | | |

| | Signature | Company | Date | Time | Comments/Special Instructions |
|---------------|----------------------|---------------|--------|-------|---|
| Relinquished | <i>Brianna Bleud</i> | Herrera | 6/9/18 | 8:35 | total sig. see attached |
| Received | <i>J. Kalson</i> | OS2 | 6.9.18 | 8:35A | |
| Relinquished | | | | | |
| Received | | | | | |
| Relinquished | | | | | |
| Received | | | | | Data Package: Standard <input type="checkbox"/> Level III <input type="checkbox"/> Level IV <input type="checkbox"/> |
| Reviewed/Date | | Reviewed/Date | | | Chromatograms with final report <input type="checkbox"/> Electronic Data Deliverables (EDDs) <input type="checkbox"/> |

Chain of Custody

Company: Herrera
 Project Number: 14-05806-000
 Project Name: RPWS
 Project Manager: John Leath
 Sampled by: Brianna Bland

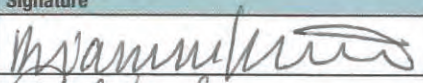
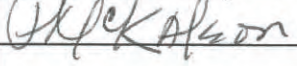
Turnaround Request (in working days)

(Check One)

Same Day 1 Day
 2 Days 3 Days
 Standard (7 Days)
 (TPH analysis 5 Days)
 _____ (other)

Laboratory Number: 06-100

| Lab ID | Sample Identification | Date Sampled | Time Sampled | Matrix | Number of Containers | Analytical Parameters | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|--------|-----------------------|--------------|--------------|--------|----------------------|-----------------------|---------------|----------|---|-----------------|-----------------------------|----------------------------|---|----------------------------|------------|---------------------------------|---------------------------------------|-----------------------------------|--------------------------------|-------------------|-------------|----------------------------|--------------------------|-------------------|--------------------------|------------------|------------|------------------|--|--|--|--|---|---|---|---|---|
| | | | | | | NWTPH-HCID | NWTPH-Gx/BTEX | NWTPH-Gx | NWTPH-Dx <input type="checkbox"/> Acid / SG Clean-up) | Volatiles 8260C | Halogenated Volatiles 8260C | EDB EPA 8011 (Waters Only) | Semivolatiles 8270D/SIM (with low-level PAHs) | PAHs 8270D/SIM (low-level) | PCBs 8082A | Organochlorine Pesticides 8081B | Organophosphorus Pesticides 8270D/SIM | Chlorinated Acid Herbicides 8151A | Total REPA-Metals <u>Cu Zn</u> | Total MTCA Metals | TCLP Metals | HEM (oil and grease) 1664A | TSS, turbidity, hardness | dissolved Cu + Zn | dissolved organic carbon | Total phosphorus | % Moisture | Fecal C, Total N | | | | | | | | | |
| 11 | TYLMI - 20180608 | 6.8.18 | 1740 | water | 7 | | | | | | | | | | | | | | | | | | | X | | | | | | | | | X | X | X | X | X |
| 12 | TYLMO - 20180608 | | 1710 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 13 | TDSMI - 20180608 | | 1510 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 14 | TDSMO - 20180608 | | 1630 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 15 | QASI - 20180608 | ✓ | 1650 | ✓ | ✓ | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

| | Signature | Company | Date | Time | Comments/Special Instructions |
|---------------|---|---------------|--------|-------|---|
| Relinquished |  | Herrera | 6.9.18 | 8:35 | see attached |
| Received |  | OSE | 6.9.18 | 8:35A | |
| Relinquished | | | | | |
| Received | | | | | |
| Relinquished | | | | | |
| Received | | | | | |
| Reviewed/Date | | Reviewed/Date | | | Data Package: Standard <input type="checkbox"/> Level III <input type="checkbox"/> Level IV <input type="checkbox"/> Chromatograms with final report <input type="checkbox"/> Electronic Data Deliverables (EDDs) <input type="checkbox"/> |

- total suspended solids
- turbidity
- hardness
- dissolved organic carbon
- fecal coliform
- total phosphorus
- total nitrogen
- total Cu and Zn
- Dissolved Cu and Zn

METER CALIBRATION LOG - Redmond Paired Watershed Study

Project Number: 14-05806-000
Personnel Performing Calibration: ALEX SVENDSEN
Meter: VSI PRODS5 #72
Date/Time: 6/8/18 1400
Barometric Pressure Start of Day: mmHg: 759.4 Time: 1400
Barometric Pressure End of Day: mmHg: 757.4 Time: 2107

| PRE Field Run CALIBRATION | Meter Reading | Buffer / Cal Std | Temp °C | Comments |
|---------------------------|---------------|------------------|---------|----------------------------------|
| Conductivity (µS/cm) | 0.7 | 0 | 24.2 | NEW DI FILTER RECENTLY INSTALLED |
| Conductivity (µS/cm) | 999 | 1,000 | 23.5 | |
| Conductivity (µS/cm) | 100.6 | 100 | 23.8 | |
| DO % Saturation | 99.9 | 100 | 21.3 | |

| POST Field Run CHECK | Meter Reading | Buffer / Cal Std | Temp °C | Comments |
|----------------------|---------------|------------------|---------|----------|
| Conductivity (µS/cm) | 0.9 | 0 | 23.8 | |
| Conductivity (µS/cm) | 99.8 | 100 | 23.8 | |
| DO % Saturation | 99.7 | 100 | 24.2 | |

Calibration Procedures:

Rinse Multimeter Sonde Between Each Operation

Rinse 3 times with tap water, 3 times with deionized water, then 3 times with the solution to be used for calibrating or testing.

Conductivity Calibration Notes:

1. Dry the conductivity probe with a lab tissue (e.g., KimWipes®) and DI water.
2. Fill calibration cup to within a centimeter of the top of the calibration cup with DI water (0 µS).
3. Fill the calibration cup with 1,000 µS standard so that the temperature/conductivity probe is submerged.
4. Make sure there are no bubbles in the cell; wait 2 minutes.
5. Enter the appropriate standard value (1,000 µS/cm or 1.0 mS/cm) for Sp Cond.
6. Check conductivity using 100 µS/cm standard.

Dissolved Oxygen Calibration Notes:

1. Fill the calibration cup with about 1/2 inch of DI; it should be below the sensor cap.
2. Use KimWipes® to dry any droplets from the sensor cap.
3. Invert calibration cup's cap and gently rest it on the cup.
4. Wait 5 minutes, making sure that temperature stabilizes.
5. Determine local barometric pressure (mm Hg) and enter this value into the meter.
6. Click "Calibrate". "Calibrate Successful" will be displayed.
7. To retain calibration accuracy between measurements, store with the sensor immersed in water or within a water-saturated air environment such as a sealed storage cup with at least 10 ml of water.
8. It is important to have the water-saturated air and the sensor at the same temperature. Therefore, store a jar of DI in the same environment as the sonde and calibrate in a similar air temperature as the water and sonde.
9. Keep probe out of direct sun or wind.



METER CALIBRATION LOG - Redmond Paired Watershed Study

Project Number: 14-05806-000
Personnel Performing Calibration: AEE SVENDSEN
Meter: YSI PRO DSS #1
Date/Time: 6/8/2018 1400
Barometric Pressure Start of Day: mmHg: 759.0 Time: 1400
Barometric Pressure End of Day: mmHg: 757.0 Time: 2107

Calibration Procedures:

Rinse Multimeter Sonde Between Each Operation

Rinse 3 times with tap water, 3 times with deionized water, then 3 times with the solution to be used for calibrating or testing.

Conductivity Calibration Notes:

1. Dry the conductivity probe with a lab tissue (e.g., KimWipes®) and DI water.
2. Fill calibration cup to within a centimeter of the top of the calibration cup with DI water (0 µS).
3. Fill the calibration cup with 1,000 µS standard so that the temperature/conductivity probe is submerged.
4. Make sure there are no bubbles in the cell; wait 2 minutes.
5. Enter the appropriate standard value (1,000 µS/cm or 1.0 mS/cm) for Sp Cond.
6. Check conductivity using 100 µS/cm standard.

Dissolved Oxygen Calibration Notes:

1. Fill the calibration cup with about 1/2 inch of DI; it should be below the sensor cap.
2. Use KimWipes® to dry any droplets from the sensor cap.
3. Invert calibration cup's cap and gently rest it on the cup.
4. Wait 5 minutes, making sure that temperature stabilizes.
5. Determine local barometric pressure (mm Hg) and enter this value into the meter.
6. Click "Calibrate". "Calibrate Successful" will be displayed.
7. To retain calibration accuracy between measurements, store with the sensor immersed in water or within a water-saturated air environment such as a sealed storage cup with at least 10 ml of water.
8. It is important to have the water-saturated air and the sensor at the same temperature. Therefore, store a jar of DI in the same environment as the sonde and calibrate in a similar air temperature as the water and sonde.
9. Keep probe out of direct sun or wind.



| PRE Field Run CALIBRATION | Meter Reading | Buffer / Cal Std | Temp °C | Comments |
|---------------------------|---------------|------------------|---------|----------------------------------|
| Conductivity (µS/cm) | 2.2 | 0 | 23.9 | NEW DI FILTER RECENTLY INSTALLED |
| Conductivity (µS/cm) | 1,001 | 1,000 | 23.9 | |
| Conductivity (µS/cm) | 99.9 | 100 | 23.6 | |
| DO % Saturation | 103.6 | 100 | 22.1 | READS 100.0% AFTER CAL |
| POST Field Run CHECK | Meter Reading | Buffer / Cal Std | Temp °C | Comments |
| Conductivity (µS/cm) | 1.0 | 0 | 23.6 | |
| Conductivity (µS/cm) | 99.2 | 100 | 23.7 | |
| DO % Saturation | 100.2 | 100 | 24.1 | |

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: SG AB
 Sample Date: 06/08/18 Sample Time: 16:40 PBT
 Base Flow or Storm Event? Field Filtered Time: 16:45 PST
 (Must filter within 15 minutes of collection)

SITE ID: COLM
 Project Number: 14-05806-000



Water Quality Sampling

Sample ID: COLM-20180608

Project Name: Redmond Paired Watershed Study
 Current Weather and Temp: 59° light rain

| Parameter | Bottle Type | Bottle Volume | # Bottles | Preservative | Duplicated? |
|---------------------------|-------------|---------------|-----------|--------------------------------|-------------|
| TSS and Turbidity | HDPE | 1L | 1 | NA | Yes |
| DOC * | HDPE | 250 ml | 1 | HCL | |
| Fecal Col. Bact. | HDPE | 250 ml | 1 | EDTA | |
| T. Phosphorous | HDPE | 250 ml | 1 | H ₂ SO ₄ | |
| T. Nitrogen | HDPE | 250 ml | 1 | H ₂ SO ₄ | |
| Diss. Cu and Zn * | HDPE | 250 ml | 1 | HNO ₃ | ↓ |
| Hardness, Total Cu and Zn | HDPE | 500 ml | 1 | HNO ₃ | |

Field Meter Calibration
 Check which field meter was used and complete the meter calibration form
 YSI Pro Plus (15D100020) _____
 YSI Pro DSS 1 _____
 YSI Pro DSS 2 _____

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump
 Duplicate sample ID: 2451-20180608 @ 16:50
 Filter blank sample ID: NA
 Transfer blank sample ID: NA

Stream Stage Measurement
 Indicate reference point for measurement (to nearest 100th of a foot)
 Stream Stage (ft): 5.58
 Reference Point (description): SG

Visual and Olfactory Conditions:
 Clarity: yellow / +anin-y, clear
 Color: _____
 Odor: none
 Sheen: _____
 Floatables: _____

Water Quality Measurements
 Temperature (°C) 13.0
 Specific Conductivity (µs/cm) ~~7.74~~ 36.2
 Dissolved Oxygen (mg/L) 7.74

LABORATORY DELIVERY

Date: _____ Time: _____

Quality Assurance

Checked By: S. L... Signature: _____
 Date Checked: 7-13-18 Time: _____
 Data Entered into Database? YES NO initials: _____
 Date Entered: _____ Time: _____
 Notes: _____

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: AS
 Sample Date: 6-8-18 Sample Time: 1555
 Base Flow or Storm Event? (circled) Field Filtered Time: 1600
(Must filter within 15 minutes of collection)

SITE ID: COUM1
 PDT: PST:
 Project Number: 14-05806-000



Project Name: Redmond Paired Watershed Study

Current Weather and Temp: 60°F, STRADY RAIN

Water Quality Sampling

Sample ID: COUM1-20180608

| Parameter | Bottle Type | Bottle Volume | # Bottles | Preservative | Duplicated? |
|---------------------------|-------------|---------------|-----------|--------------------------------|-------------|
| TSS and Turbidity | HDPE | 1L | 1 | NA | N |
| DOC * | HDPE | 250 ml | 1 | HCL | |
| Fecal Col. Bact. | HDPE | 250 ml | 1 | EDTA | |
| T. Phosphorous | HDPE | 250 ml | 1 | H ₂ SO ₄ | |
| T. Nitrogen | HDPE | 250 ml | 1 | H ₂ SO ₄ | |
| Diss. Cu and Zn * | HDPE | 250 ml | 1 | HNO ₃ | |
| Hardness, Total Cu and Zn | HDPE | 500 ml | 1 | HNO ₃ | V |

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID: NA
 Filter blank sample ID: ↓
 Transfer blank sample ID: ↓

Visual and Olfactory Conditions:

Clarity: MODERATELY TURBID, LOW FLOW
 Color: 4.6 x 5 green
 Odor: None
 Sheen: ↓
 Floatables: ↓

LABORATORY DELIVERY

Date: _____ Time: _____

Quality Assurance

Checked By: J. Lumb Signature: [Signature]
 Date Checked: 7-13-18 Time: _____
 Data Entered into Database? YES NO initials:
 Date Entered: _____ Time: _____
 Notes: _____

Field Meter Calibration

Check which field meter was used and complete the meter calibration form
YSI Pro Plus (15D100020)
YSI Pro DSS 1
YSI Pro DSS 2

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)
 Stream Stage (ft): 2.66
 Reference Point (description): S-6

Water Quality Measurements

Temperature (°C) 12.2
 Specific Conductivity (µs/cm) 322 @
 Dissolved Oxygen (mg/L) 10.41

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

 Field Personnel: AS

 Sample Date: 6/8/18

 Sample Time: 1525

 PDT:

SITE ID:

COUMO

 Base Flow Storm Event?

 Field Filtered Time: 1530

PST:

 Project Number: 14-05806-000

(Must filter within 15 minutes of collection)


HERRERA

 Project Name: Redmond Paired Watershed Study

Water Quality Sampling

 Sample ID: COUMO-20180608

| Parameter | Bottle Type | Bottle Volume | # Bottles | Preservative | Duplicated? |
|---------------------------|-------------|---------------|-----------|--------------------------------|-------------|
| TSS and Turbidity | HDPE | 1L | 1 | NA | N |
| DOC * | HDPE | 250 ml | 1 | HCL | ↓ |
| Fecal Col. Bact. | HDPE | 250 ml | 1 | EDTA | |
| T. Phosphorous | HDPE | 250 ml | 1 | H ₂ SO ₄ | |
| T. Nitrogen | HDPE | 250 ml | 1 | H ₂ SO ₄ | |
| Diss. Cu and Zn * | HDPE | 250 ml | 1 | HNO ₃ | |
| Hardness, Total Cu and Zn | HDPE | 500 ml | 1 | HNO ₃ | |

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

 Duplicate sample ID: NA

Filter blank sample ID:

Transfer blank sample ID:

Visual and Olfactory Conditions:

 Clarity: SLIGHTLY TURBID
 Color: VERY LIGHT GREY
 Odor: NONE
 Sheen: NONE
 Floatables: NONE

LABORATORY DELIVERY

Date:

Time:

Quality Assurance

 Checked By: S. Leuth

Signature:

 Date Checked: 7-13-18

Time:

Data Entered into Database?

YES

NO

initials:

Date Entered:

Time:

Notes:

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

YSI Pro Plus (15D100020)

 YSI Pro DSS 1

YSI Pro DSS 2

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

 Stream Stage (ft): 1.27

 Reference Point (description): SG

Water Quality Measurements

Temperature (°C)

13.3

Specific Conductivity (µs/cm)

265.7

Dissolved Oxygen (mg/L)

9.83

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: BB JG
 Sample Date: 6/8/19 Sample Time: 15:2545 FDT
 Base Flow or Storm Event? Field Filtered Time: 15:4050 PST
 (Must filter within 15 minutes of collection)

SITE ID: EVAMS
 Project Number: 14-05806-000



Water Quality Sampling

Sample ID: EVAMS-2018 0608

Project Name: Redmond Paired Watershed Study
 Current Weather and Temp: 57° light rain

| Parameter | Bottle Type | Bottle Volume | # Bottles | Preservative | Duplicated? |
|---------------------------|-------------|---------------|-----------|--------------------------------|-------------|
| TSS and Turbidity | HDPE | 1L | 1 | NA | N |
| DOC * | HDPE | 250 ml | 1 | HCL | ↓ |
| Fecal Col. Bact. | HDPE | 250 ml | 1 | EDTA | |
| T. Phosphorous | HDPE | 250 ml | 1 | H ₂ SO ₄ | |
| T. Nitrogen | HDPE | 250 ml | 1 | H ₂ SO ₄ | |
| Diss. Cu and Zn * | HDPE | 250 ml | 1 | HNO ₃ | |
| Hardness, Total Cu and Zn | HDPE | 500 ml | 1 | HNO ₃ | |

Field Meter Calibration

Check which field meter was used and complete the meter calibration form
 YSI Pro Plus (15D100020) _____
 YSI Pro DSS 1 _____
 YSI Pro DSS 2

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)
 Stream Stage (ft): 3.91
 Reference Point (description): SG

Water Quality Measurements

Temperature (°C) 12.3
 Specific Conductivity (µs/cm) 722.1
 Dissolved Oxygen (mg/L) 10.48

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID: _____
 Filter blank sample ID: _____
 Transfer blank sample ID: _____

Visual and Olfactory Conditions:

Clarity: clear
 Color: none
 Odor: _____
 Sheen: _____
 Floatables: _____

LABORATORY DELIVERY

Date: _____ Time: _____

Quality Assurance

Checked By: J. Lentz Signature: [Signature]
 Date Checked: 7-13-19 Time: _____
 Data Entered into Database? YES NO initials:
 Date Entered: _____ Time: _____
 Notes: _____

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

 Field Personnel: BB JB

 Sample Date: 6/8/18

 Sample Time: 16:05

 POT: 0

 SITE ID: EVALSS

 Base Flow or Storm Event? 0

 Field Filtered Time: 16:10

PST:

 Project Number: 14-05806-000

(Must filter within 15 minutes of collection)


HERRERA

 Project Name: Redmond Paired Watershed Study

 Current Weather and Temp: 59° light rain

Water Quality Sampling

 Sample ID: EVALSS - 20180608

| Parameter | Bottle Type | Bottle Volume | # Bottles | Preservative | Duplicated? |
|---------------------------|-------------|---------------|-----------|--------------------------------|-------------|
| TSS and Turbidity | HDPE | 1L | 1 | NA | ✓ |
| DOC * | HDPE | 250 ml | 1 | HCL | ↓ |
| Fecal Col. Bact. | HDPE | 250 ml | 1 | EDTA | |
| T. Phosphorous | HDPE | 250 ml | 1 | H ₂ SO ₄ | |
| T. Nitrogen | HDPE | 250 ml | 1 | H ₂ SO ₄ | |
| Diss. Cu and Zn * | HDPE | 250 ml | 1 | HNO ₃ | |
| Hardness, Total Cu and Zn | HDPE | 500 ml | 1 | HNO ₃ | |

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID: _____

Filter blank sample ID: _____

Transfer blank sample ID: _____

Visual and Olfactory Conditions:

 Clarity: clear

 Color: none

Odor: _____

Sheen: _____

Floatables: _____

LABORATORY DELIVERY

Date: _____

Time: _____

Quality Assurance

 Checked By: S. C...

 Signature: [Signature]

 Date Checked: 7-13-18

Time: _____

Data Entered into Database?

YES

NO

initials: _____

Date Entered: _____

Time: _____

Notes: _____

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

YSI Pro Plus (15D100020) _____

YSI Pro DSS 1 _____

YSI Pro DSS 2 _____

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

 Stream Stage (ft): 2.29

 Reference Point (description): S6

Water Quality Measurements

 Temperature (°C) 12.4

 Specific Conductivity (µs/cm) 201.7

 Dissolved Oxygen (mg/L) 10.58

91

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: AS
 Sample Date: 6-3-18 Sample Time: 1830 PDT:
 Base Flow or Storm Event? Storm Field Filtered Time: 1835 PST: X
 (Must filter within 15 minutes of collection)

SITE ID: MONMN
 Project Number: 14-05806-000



Project Name: Redmond Paired Watershed Study
 Current Weather and Temp: steady rain, 58°F

Water Quality Sampling

Sample ID: MONMN-20180608

| Parameter | Bottle Type | Bottle Volume | # Bottles | Preservative | Duplicated? |
|---------------------------|-------------|---------------|-----------|--------------------------------|-------------|
| TSS and Turbidity | HDPE | 1L | 1 | NA | N |
| DOC * | HDPE | 250 ml | 1 | HCL | |
| Fecal Col. Bact. | HDPE | 250 ml | 1 | EDTA | |
| T. Phosphorous | HDPE | 250 ml | 1 | H ₂ SO ₄ | |
| T. Nitrogen | HDPE | 250 ml | 1 | H ₂ SO ₄ | |
| Diss. Cu and Zn * | HDPE | 250 ml | 1 | HNO ₃ | |
| Hardness, Total Cu and Zn | HDPE | 500 ml | 1 | HNO ₃ | |

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID: _____
 Filter blank sample ID: _____
 Transfer blank sample ID: _____

Visual and Olfactory Conditions:

Clarity: clear
 Color: none
 Odor: _____
 Sheen: _____
 Floatables: _____

LABORATORY DELIVERY

Date: _____ Time: _____

Quality Assurance

Checked By: Z. Lenth Signature: [Signature]
 Date Checked: 7-13-18 Time: _____
 Data Entered into Database? YES NO initials:
 Date Entered: _____ Time: _____
 Notes: _____

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

YSI Pro Plus (15D100020) _____
 YSI Pro DSS 1 X _____
 YSI Pro DSS 2 _____

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): 9.12
 Reference Point (description): Stg

Water Quality Measurements

Temperature (°C) 12.8
 Specific Conductivity (µs/cm) 234.0
 Dissolved Oxygen (mg/L) 9.57

FIELD SAMPLING SHEET - Redmond Paired Watershed Study



Field Personnel: AS
 Sample Date: 10-8-18 Sample Time: 1830
 Base Flow or Storm Event? (circled) Field Filtered Time: 1855
(Must filter within 15 minutes of collection)

SITE ID: MONMS
 Project Number: 14-05806-000

Project Name: Redmond Paired Watershed Study
 Current Weather and Temp: Rain 58°F

Water Quality Sampling

Sample ID: MONMS-20180608

| Parameter | Bottle Type | Bottle Volume | # Bottles | Preservative | Duplicated? |
|---------------------------|-------------|---------------|-----------|--------------------------------|-------------|
| TSS and Turbidity | HDPE | 1L | 1 | NA | N |
| DOC * | HDPE | 250 ml | 1 | HCL | |
| Fecal Col. Bact. | HDPE | 250 ml | 1 | EDTA | |
| T. Phosphorous | HDPE | 250 ml | 1 | H ₂ SO ₄ | |
| T. Nitrogen | HDPE | 250 ml | 1 | H ₂ SO ₄ | |
| Diss. Cu and Zn * | HDPE | 250 ml | 1 | HNO ₃ | |
| Hardness, Total Cu and Zn | HDPE | 500 ml | 1 | HNO ₃ | ✓ |

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID: _____
 Filter blank sample ID: _____
 Transfer blank sample ID: _____

Visual and Olfactory Conditions:

Clarity: clear
 Color: none
 Odor: ↓
 Sheen: _____
 Floatables: _____

LABORATORY DELIVERY

Date: _____ Time: _____

Quality Assurance

Checked By: S. Lenth Signature: [Signature]
 Date Checked: 7-13-18 Time: _____
 Data Entered into Database? YES NO initials:
 Date Entered: _____ Time: _____
 Notes: _____

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

YSI Pro Plus (15D100020) _____
 YSI Pro DSS 1 X _____
 YSI Pro DSS 2 _____

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): 10.77
 Reference Point (description): vault

Water Quality Measurements

Temperature (°C) 13.3
 Specific Conductivity (µs/cm) 364.4
 Dissolved Oxygen (mg/L) 8.19

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: JG JB
 Sample Date: 6/8/17 Sample Time: 18:40 PDT
 Base Flow or Storm Event? Field Filtered Time: 18:45 PST
(Must filter within 15 minutes of collection)

SITE ID: MONM
 Project Number: 14-05806-000



Project Name: Redmond Paired Watershed Study
 Current Weather and Temp: 55° light rain

Water Quality Sampling

Sample ID: MONM - 20180608

| Parameter | Bottle Type | Bottle Volume | # Bottles | Preservative | Duplicated? |
|---------------------------|-------------|---------------|-----------|--------------------------------|-------------|
| TSS and Turbidity | HDPE | 1L | 1 | NA | N |
| DOC * | HDPE | 250 ml | 1 | HCL | N |
| Fecal Col. Bact. | HDPE | 250 ml | 1 | EDTA | N |
| T. Phosphorous | HDPE | 250 ml | 1 | H ₂ SO ₄ | N |
| T. Nitrogen | HDPE | 250 ml | 1 | H ₂ SO ₄ | N |
| Diss. Cu and Zn * | HDPE | 250 ml | 1 | HNO ₃ | N |
| Hardness, Total Cu and Zn | HDPE | 500 ml | 1 | HNO ₃ | N |

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID: _____
 Filter blank sample ID: _____
 Transfer blank sample ID: _____

Visual and Olfactory Conditions:

Clarity: clear
 Color: none
 Odor: _____
 Sheen: _____
 Floatables: _____

LABORATORY DELIVERY

Date: _____ Time: _____

Quality Assurance

Checked By: J. Cuth Signature: [Signature]
 Date Checked: 7-13-18 Time: _____
 Data Entered into Database? YES NO initials: _____
 Date Entered: _____ Time: _____
 Notes: _____

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

YSI Pro Plus (15D100020) _____
 YSI Pro DSS 1 _____
 YSI Pro DSS 2 _____

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): N/A
 Reference Point (description): N/A

Water Quality Measurements

Temperature (°C) 12.8°
 Specific Conductivity (µs/cm) 246.7
 Dissolved Oxygen (mg/L) 10.27

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: BB JG

Sample Date: 6/18/18

Sample Time: 1720

PDT

SITE ID: SEIMN

Base Flow or Storm Event? (circled)

Field Filtered Time: 1725

PST

Project Number: 14-05806-000



Project Name: Redmond Paired Watershed Study

Current Weather and Temp: Rain 35.9°F

Water Quality Sampling

Sample ID: SEIMN-20180608

| Parameter | Bottle Type | Bottle Volume | # Bottles | Preservative | Duplicated? |
|---------------------------|-------------|---------------|-----------|--------------------------------|-------------------------------------|
| TSS and Turbidity | HDPE | 1L | 1 | NA | <input checked="" type="checkbox"/> |
| DOC * | HDPE | 250 ml | 1 | HCL | |
| Fecal Col. Bact. | HDPE | 250 ml | 1 | EDTA | |
| T. Phosphorus | HDPE | 250 ml | 1 | H ₂ SO ₄ | |
| T. Nitrogen | HDPE | 250 ml | 1 | H ₂ SO ₄ | |
| Diss. Cu and Zn * | HDPE | 250 ml | 1 | HNO ₃ | |
| Hardness, Total Cu and Zn | HDPE | 500 ml | 1 | HNO ₃ | |

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID: _____

Filter blank sample ID: _____

Transfer blank sample ID: _____

Visual and Olfactory Conditions:

Clarity: clear
 Color: none
 Odor: ↓
 Sheen: _____
 Floatables: _____

LABORATORY DELIVERY

Date: _____

Time: _____

Quality Assurance

Checked By: S. Leuth

Signature: [Signature]

Date Checked: 7-13-18

Time: _____

Data Entered into Database? YES NO

initials: _____

Date Entered: _____

Time: _____

Notes: _____

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

YSI Pro Plus (15D100020) _____

YSI Pro DSS 1 _____

YSI Pro DSS 2

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): 0.65

Reference Point (description): bottom of bolt L

Water Quality Measurements

Temperature (°C) 11.2

Specific Conductivity (µs/cm) 104.5

Dissolved Oxygen (mg/L) 10.76

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: J6 BB

Sample Date: 8/18

Sample Time: 1820

SITE ID: SEHMS

Base Flow or Storm Event? Storm

Field Filtered Time: 1825

Project Number: 14-05806-000

(Must filter within 15 minutes of collection)



HERRERA

Water Quality Sampling

Sample ID: SEHMS-20180608

| Parameter | Bottle Type | Bottle Volume | # Bottles | Preservative | Duplicated? |
|---------------------------|-------------|---------------|-----------|--------------------------------|-------------|
| TSS and Turbidity | HDPE | 1L | 1 | NA | |
| DOC * | HDPE | 250 ml | 1 | HCL | |
| Fecal Col. Bact. | HDPE | 250 ml | 1 | EDTA | |
| T. Phosphorous | HDPE | 250 ml | 1 | H ₂ SO ₄ | |
| T. Nitrogen | HDPE | 250 ml | 1 | H ₂ SO ₄ | |
| Diss. Cu and Zn * | HDPE | 250 ml | 1 | HNO ₃ | |
| Hardness, Total Cu and Zn | HDPE | 500 ml | 1 | HNO ₃ | |

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID: _____
 Filter blank sample ID: _____
 Transfer blank sample ID: _____

Visual and Olfactory Conditions:

Clarity: clear
 Color: none
 Odor: _____
 Sheen: _____
 Floatables: _____

LABORATORY DELIVERY

Date: _____ Time: _____

Quality Assurance

Checked By: Z. Lenth Signature: [Signature]

Date Checked: 7-13-18 Time: _____

Data Entered into Database? YES NO initials: _____

Date Entered: _____ Time: _____

Notes: _____

Project Name: Redmond Paired Watershed Study

Current Weather and Temp: 55° light air

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

YSI Pro Plus (15D100020) _____

YSI Pro DSS 1 _____

YSI Pro DSS 2 _____

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): 0.75

Reference Point (description): SG

Water Quality Measurements

Temperature (°C) 11.4

Specific Conductivity (µs/cm) 117.5

Dissolved Oxygen (mg/L) 10.39

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: BB JG
 Sample Date: 6/8/18 Sample Time: 15:10 PDT
 Base Flow or Storm Event? Field Filtered Time: 15:15 PST
(Must filter within 15 minutes of collection)

SITE ID: TOSMI
 Project Number: 14-05806-000



Project Name: Redmond Paired Watershed Study
 Current Weather and Temp: 57° light rain

Water Quality Sampling

Sample ID: TOSMI - 20180608

| Parameter | Bottle Type | Bottle Volume | # Bottles | Preservative | Duplicated? |
|---------------------------|-------------|---------------|-----------|--------------------------------|-------------|
| TSS and Turbidity | HDPE | 1L | 1 | NA | N |
| DOC * | HDPE | 250 ml | 1 | HCL | |
| Fecal Col. Bact. | HDPE | 250 ml | 1 | EDTA | |
| T. Phosphorous | HDPE | 250 ml | 1 | H ₂ SO ₄ | |
| T. Nitrogen | HDPE | 250 ml | 1 | H ₂ SO ₄ | |
| Diss. Cu and Zn * | HDPE | 250 ml | 1 | HNO ₃ | D |
| Hardness, Total Cu and Zn | HDPE | 500 ml | 1 | HNO ₃ | |

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID:
 Filter blank sample ID:
 Transfer blank sample ID:

Visual and Olfactory Conditions:

Clarity: cloudy
 Color: brown
 Odor: none
 Sheen: bubbles upstream
 Floatables: fine sed. org. debris

LABORATORY DELIVERY

Date: Time:

Quality Assurance

Checked By: J. Lenth Signature: [Signature]
 Date Checked: 7-13-18 Time:
 Data Entered into Database? YES NO initials:
 Date Entered: Time:
 Notes:

Field Meter Calibration

Check which field meter was used and complete the meter calibration form
YSI Pro Plus (15D100020)
YSI Pro DSS 1
YSI Pro DSS 2

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)
 Stream Stage (ft): 0.78
 Reference Point (description): SG

Water Quality Measurements

Temperature (°C) 13.7
 Specific Conductivity (µs/cm) 270.1
 Dissolved Oxygen (mg/L) 10.06

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: AS
 Sample Date: 6-8-18 Sample Time: 1630 PDT
 Base Flow or Storm Event? Storm Event? Field Filtered Time: 1635 PST:
(Must filter within 15 minutes of collection)

SITE ID: TOSMO
 Project Number: 14-05806-000



Project Name: Redmond Paired Watershed Study

Current Weather and Temp: STEADY RAIN, 59F

Water Quality Sampling

Sample ID: TOSMO-20180608

| Parameter | Bottle Type | Bottle Volume | # Bottles | Preservative | Duplicated? |
|---------------------------|-------------|---------------|-----------|--------------------------------|-------------|
| TSS and Turbidity | HDPE | 1L | 1 | NA | N |
| DOC * | HDPE | 250 ml | 1 | HCL | ↓ |
| Focal Col. Bact. | HDPE | 250 ml | 1 | EDTA | |
| T. Phosphorous | HDPE | 250 ml | 1 | H ₂ SO ₄ | |
| T. Nitrogen | HDPE | 250 ml | 1 | H ₂ SO ₄ | |
| Diss. Cu and Zn * | HDPE | 250 ml | 1 | HNO ₃ | |
| Hardness, Total Cu and Zn | HDPE | 500 ml | 1 | HNO ₃ | |

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID: NA
 Filter blank sample ID: ↓
 Transfer blank sample ID: ↓

Visual and Olfactory Conditions:

Clarity: TURBID
 Color: Brown
 Odor: None
 Sheen: None
 Floatables: FOAM

LABORATORY DELIVERY

Date: _____ Time: _____

Quality Assurance

Checked By: S. Lenz Signature: [Signature]
 Date Checked: 7-13-18 Time: _____
 Data Entered into Database? YES NO initials: _____
 Date Entered: _____ Time: _____
 Notes: _____

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

YSI Pro Plus (15D100020) _____
 YSI Pro DSS 1 _____
 YSI Pro DSS 2 _____

Stream/Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): 0.59
 Reference Point (description): S.G.

Water Quality Measurements

Temperature (°C) 12.3
 Specific Conductivity (µs/cm) 254.0
 Dissolved Oxygen (mg/L) 10.56

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: AS

Sample Date: 6-8-18

Sample Time: 1740

PDT:

SITE ID: TYLM.1

Base Flow or Storm Event? Storm Event?

Field Filtered Time: 1745

PST:

Project Number: 14-05806-000

(Must filter within 15 minutes of collection)



HERRERA

Project Name: Redmond Paired Watershed Study

Current Weather and Temp: LIGHT RAIN, 58°F

Water Quality Sampling

Sample ID: TYLM1-20180608

| Parameter | Bottle Type | Bottle Volume | # Bottles | Preservative | Duplicated? |
|---------------------------|-------------|---------------|-----------|--------------------------------|-------------|
| TSS and Turbidity | HDPE | 1L | 1 | NA | <u>N</u> |
| DOC * | HDPE | 250 ml | 1 | HCL | ↓ |
| Fecal Col. Bact. | HDPE | 250 ml | 1 | EDTA | |
| T. Phosphorous | HDPE | 250 ml | 1 | H ₂ SO ₄ | |
| T. Nitrogen | HDPE | 250 ml | 1 | H ₂ SO ₄ | |
| Diss. Cu and Zn * | HDPE | 250 ml | 1 | HNO ₃ | |
| Hardness, Total Cu and Zn | HDPE | 500 ml | 1 | HNO ₃ | |

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID: NA

Filter blank sample ID: ↓

Transfer blank sample ID: ↓

Visual and Olfactory Conditions:

Clarity: SLIGHTLY TURBID, LOW FLOW

Color: LIGHT GRAY

Odor: NONE

Sheen: ↓

Floatables: ↓

LABORATORY DELIVERY

Date:

Time:

Quality Assurance

Checked By: J. Leuth

Signature: [Signature]

Date Checked: 7-13-18

Time:

Data Entered into Database?

YES

NO

initials:

Date Entered:

Time:

Notes:

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

YSI Pro Plus (15D100020)

YSI Pro DSS 1

YSI Pro DSS 2

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): 4.56

Reference Point (description): TOP OF CURVE TO H₂C

Water Quality Measurements

Temperature (°C) 13.0

Specific Conductivity (µs/cm) 249.0

Dissolved Oxygen (mg/L) 9.51

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: AS

Sample Date: 6-8-18

Sample Time: 1710

PDT:

SITE ID: TYLMO

Base Flow or Storm Event? Storm

Field Filtered Time: 1715

PST:

Project Number: 14-05806-000

(Must filter within 15 minutes of collection)



Project Name: Redmond Paired Watershed Study

Current Weather and Temp: STRAYL WIND, 59 F

Water Quality Sampling

Sample ID: TYLMO-20180608

| Parameter | Bottle Type | Bottle Volume | # Bottles | Preservative | Duplicated? |
|---------------------------|-------------|---------------|-----------|--------------------------------|-------------|
| TSS and Turbidity | HDPE | 1L | 1 | NA | N |
| DOC * | HDPE | 250 ml | 1 | HCL | ↓ |
| Fecal Col. Bact. | HDPE | 250 ml | 1 | EDTA | ↓ |
| T. Phosphorous | HDPE | 250 ml | 1 | H ₂ SO ₄ | ↓ |
| T. Nitrogen | HDPE | 250 ml | 1 | H ₂ SO ₄ | ↓ |
| Diss. Cu and Zn * | HDPE | 250 ml | 1 | HNO ₃ | ↓ |
| Hardness, Total Cu and Zn | HDPE | 500 ml | 1 | HNO ₃ | ↓ |

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID: NA

Filter blank sample ID: ↓

Transfer blank sample ID: ↓

Visual and Olfactory Conditions:

Clarity: TURBID

Color: Light Brown

Odor: None

Sheen: ↓

Floatables: ↓

LABORATORY DELIVERY

Date: _____

Time: _____

Quality Assurance

Checked By: T. Lenth

Signature: [Signature]

Date Checked: 7-13-18

Time: _____

Data Entered into Database? YES NO

initials: _____

Date Entered: _____

Time: _____

Notes: _____

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

YSI Pro Plus (15D100020) _____

YSI Pro DSS 1 _____

YSI Pro DSS 2 _____

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): 2.86

Reference Point (description): TOP OF CULVERT

Water Quality Measurements

Temperature (°C) 12.6

Specific Conductivity (µs/cm) 228.5

Dissolved Oxygen (mg/L) 10.35



HERRERA

Data Quality Assurance Worksheet

Project Name/No./Client: Redmond Paired Watershed Study / 14-05806-000 / City of Redmond

Laboratory/Parameters: OnSite Environmental : TSS, turbidity, hardness, DOC, TP, Dissolved & Total Cu, Zn / AmTest: Total nitrogen, fecal coliform bacteria

Sample Date/Sample ID: 6/08/2018 / All locations, QA51 (COLM)

By G. Catarra

Date 7/9/2018 Page 1 of 2

Checked: initials JL

date 7/13/2017

| Parameter | Completeness/ Methodology | Pre-preservation Holding Times (minutes) | | Total Holding Times (days) | | Method Blanks Reporting Limit | Matrix Spikes/ Surrogate Recovery (%) | | Lab Control Samples Recovery (%) | | Lab Duplicates RPD (%) | | Field Duplicates RPD (%) | | Instrument Calibration/ Performance | ACTION |
|-------------------------------------|------------------------------|--|------|-------------------------------|------|--|---|------|--|------|---------------------------|-------------------|-----------------------------|-------------------|---|---|
| | | Reported | Goal | Reported | Goal | | Reported | Goal | Reported | Goal | Reported | Goal ¹ | Reported | Goal ¹ | | |
| TSS | OK / SM 2540D | NA | NA | 7 | ≤7 | ≤1.0 mg/L 1.0 mg/L | NA | NA | 83 | ±20 | 71 | ≤25 | D=1.2 | ≤25 | OK | FLAG EVALSS "J" DUE TO LAB DUPLICATE |
| Turbidity | OK / EPA 180.1 | NA | NA | 2 | ≤2 | ≤0.1 NTU 0.1 NTU | NA | NA | NA | ±10 | 3 | ≤25 | 9.5 | ≤25 | OK | NONE |
| Hardness | OK / SM 2340B | NA | NA | 10 | ≤180 | ≤1.0 mg/L 1.0 mg/L | 107,108 | ±25 | 107 | ±15 | 2 | ≤20 | 7.4 | ≤20 | OK | NONE |
| DOC | OK / SM 5310B | <15 | ≤15 | 5 | ≤28 | ≤1.0 mg/L 1.0 mg/L | 106 | ±25 | 95 | ±15 | 1 | ≤20 | 0 | ≤20 | OK | NONE |
| Total Phosphorus | OK / EPA 365.1 | NA | NA | 11 | ≤28 | ≤0.01 mg/L 0.01 mg/L | 105 | ±25 | 101 | ±20 | 2 | ≤20 | D=0.003 | ≤20 | OK | None |
| Total Nitrogen (TKN + N+N) | OK/ SM 4500 N-B | NA | NA | 7,14 | ≤28 | ≤0.1 mg/L 0.1 mg/L | 88,90 | ±25 | 90-100 | ±20 | 3.2,8.7 | ≤20 | 130, 17 | ≤20 | OK | FLAG TKN FOR COLM "J" DUE TO FD RPD. |

¹ If the sample or duplicate value is less than five times the reporting limit, the difference is calculated rather than the relative percent difference (RPD). The QA goal is a difference <2 times the detection limit instead of the number indicated in the goal column.

NA – not applicable or not available; NC – not calculable due to one or more values below the detection limit; NS – field duplicate not sampled.



Data Quality Assurance Worksheet

Project Name/No./Client: Redmond Paired Watershed Study / 14-05806-000 / City of Redmond
 Laboratory/Parameters: OnSite Environmental : TSS, turbidity, hardness, DOC, TP, Dissolved & Total Cu, Zn / AmTest: total nitrogen, fecal coliform bacteria
 Sample Date/Sample ID: 6/08/2018 / All locations, QA51 (COLM)

By G. Catarra
 Date 7/8/2018 Page 2 of 2
 Checked: initials
 date 7/13/2018

| Parameter | Completeness/ Methodology | Pre-preservation Holding Times (minutes) | | Total Holding Times (days) | | Method Blanks Reporting Limit | Matrix Spikes/ Surrogate Recovery (%) | | Lab Control Samples Recovery (%) | | Lab Duplicates RPD (%) | | Field Duplicates RPD (%) | | Instrument Calibration/ Performance | ACTION |
|------------------|------------------------------|--|------|-------------------------------|------|--|---|-------------------|--|------|---------------------------|-------------------|-----------------------------|-------------------|---|------------------------------------|
| | | Reported | Goal | Reported | Goal | | Reported | Goal ¹ | Reported | Goal | Reported | Goal ¹ | Reported | Goal ¹ | | |
| Total Copper | OK/ EPA 200.8 | NA | NA | 5 | ≤180 | ≤1.0 µg/L 1.0 µg/L | 87,85 | ±25 | NR | ±15 | 10 | ≤20 | NC | ≤20 | OK | NONE |
| Total Zinc | OK/ EPA 200.8 | NA | NA | 5 | ≤180 | ≤5.0 µg/L 5.0 µg/L | 116,115 | ±25 | NR | ±15 | 8 | ≤20 | NC | ≤20 | OK | NONE |
| Dissolved Copper | OK/ EPA 200.8 | <15 | ≤15 | 4 | ≤180 | ≤1.0 µg/L 1.0 µg/L | 93,95 | ±25 | NR | ±15 | NC | ≤20 | NC | ≤20 | OK | NONE |
| Dissolved Zinc | OK/ EPA 200.8 | <15 | ≤15 | 4 | ≤180 | ≤5.0 µg/L 5.0 µg/L | 104,104 | ±25 | NR | ±15 | NC | ≤20 | NC | ≤20 | OK | NONE |
| Fecal Coliform | OK/ SM 9222D | NA | NA | 3 | ≤1 | ≤1.0 cfu/ 100mL 10 cfu/ 100mL | NA | NA | NA | NA | 33,7.7 | ≤35 | 32 | ≤50 | OK | FLAG ALL DATA DUE TO HOLDING TIME. |

¹ If the sample or duplicate value is less than five times the reporting limit, the difference is calculated rather than the relative percent difference (RPD). The QA goal is a difference <2 times the detection limit instead of the number indicated in the goal column.

NA – not applicable or not available; NC – not calculable due to one or more values below the detection limit; NS – field duplicate not sampled.



14648 NE 95th Street, Redmond, WA 98052 • (425) 883-3881

August 25, 2018

George Iftner
Herrera Environmental Consultants, Inc.
2200 6th Avenue, Suite 1100
Seattle, WA 98121

Re: Analytical Data for Project 14-05806-000
Laboratory Reference No. 1808-097

Dear George:

Enclosed are the analytical results and associated quality control data for samples submitted on August 8, 2018.

The standard policy of OnSite Environmental, Inc. is to store your samples for 30 days from the date of receipt. If you require longer storage, please contact the laboratory.

We appreciate the opportunity to be of service to you on this project. If you have any questions concerning the data, or need additional information, please feel free to call me.

Sincerely,

A handwritten signature in black ink, appearing to read "Blair Goodrow", enclosed within a large, loopy circular flourish.

Blair Goodrow
Project Manager

Enclosures



OnSite Environmental, Inc. 14648 NE 95th Street, Redmond, WA 98052 (425) 883-3881

This report pertains to the samples analyzed in accordance with the chain of custody, and is intended only for the use of the individual or company to whom it is addressed.

Date of Report: August 25, 2018
Samples Submitted: August 8, 2018
Laboratory Reference: 1808-097
Project: 14-05806-000

Case Narrative

Samples were collected on August 8, 2018 and received by the laboratory on August 8, 2018. They were maintained at the laboratory at a temperature of 2°C to 6°C.

Please note that any and all soil sample results are reported on a dry-weight basis, unless otherwise noted below.

General QA/QC issues associated with the analytical data enclosed in this laboratory report will be indicated with a reference to a comment or explanation on the Data Qualifier page. More complex and involved QA/QC issues will be discussed in detail below.



Date of Report: August 25, 2018
 Samples Submitted: August 8, 2018
 Laboratory Reference: 1808-097
 Project: 14-05806-000

**TOTAL SUSPENDED SOLIDS
 SM 2540D**

Matrix: Water
 Units: mg/L

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|------------------------|----------------------|-----|----------|---------------|---------------|-------|
| Client ID: | COLM-20180808 | | | | | |
| Laboratory ID: | 08-097-01 | | | | | |
| Total Suspended Solids | 17 | 1.0 | SM 2540D | 8-13-18 | 8-14-18 | |

| | | | | | | |
|------------------------|-----------------------|-----|----------|---------|---------|--|
| Client ID: | COUMI-20180808 | | | | | |
| Laboratory ID: | 08-097-02 | | | | | |
| Total Suspended Solids | 16 | 1.0 | SM 2540D | 8-13-18 | 8-14-18 | |

| | | | | | | |
|------------------------|-----------------------|-----|----------|---------|---------|--|
| Client ID: | COUMO-20180808 | | | | | |
| Laboratory ID: | 08-097-03 | | | | | |
| Total Suspended Solids | 2.2 | 1.0 | SM 2540D | 8-13-18 | 8-14-18 | |

| | | | | | | |
|------------------------|-----------------------|-----|----------|---------|---------|--|
| Client ID: | EVAMS-20180808 | | | | | |
| Laboratory ID: | 08-097-04 | | | | | |
| Total Suspended Solids | 9.6 | 1.0 | SM 2540D | 8-13-18 | 8-14-18 | |

| | | | | | | |
|------------------------|------------------------|-----|----------|---------|---------|--|
| Client ID: | EVALSS-20180808 | | | | | |
| Laboratory ID: | 08-097-05 | | | | | |
| Total Suspended Solids | 6.2 | 1.0 | SM 2540D | 8-13-18 | 8-14-18 | |

| | | | | | | |
|------------------------|-----------------------|-----|----------|---------|---------|--|
| Client ID: | MONMN-20180808 | | | | | |
| Laboratory ID: | 08-097-06 | | | | | |
| Total Suspended Solids | 4.2 | 1.0 | SM 2540D | 8-13-18 | 8-14-18 | |

| | | | | | | |
|------------------------|-----------------------|-----|----------|---------|---------|--|
| Client ID: | MONMS-20180808 | | | | | |
| Laboratory ID: | 08-097-07 | | | | | |
| Total Suspended Solids | 2.0 | 1.0 | SM 2540D | 8-13-18 | 8-14-18 | |



Date of Report: August 25, 2018
 Samples Submitted: August 8, 2018
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**TOTAL SUSPENDED SOLIDS
SM 2540D**

Matrix: Water
 Units: mg/L

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|------------------------|----------------------|-----|----------|---------------|---------------|-------|
| Client ID: | MONM-20180808 | | | | | |
| Laboratory ID: | 08-097-08 | | | | | |
| Total Suspended Solids | 13 | 1.0 | SM 2540D | 8-13-18 | 8-14-18 | |

| | | | | | | |
|------------------------|-----------------------|-----|----------|---------|---------|--|
| Client ID: | SEIMN-20180808 | | | | | |
| Laboratory ID: | 08-097-09 | | | | | |
| Total Suspended Solids | 5.2 | 1.0 | SM 2540D | 8-13-18 | 8-14-18 | |

| | | | | | | |
|------------------------|-----------------------|-----|----------|---------|---------|--|
| Client ID: | SEIMS-20180808 | | | | | |
| Laboratory ID: | 08-097-10 | | | | | |
| Total Suspended Solids | 8.4 | 1.0 | SM 2540D | 8-13-18 | 8-14-18 | |

| | | | | | | |
|------------------------|-----------------------|-----|----------|---------|---------|--|
| Client ID: | TOSMI-20180808 | | | | | |
| Laboratory ID: | 08-097-11 | | | | | |
| Total Suspended Solids | 6.2 | 1.0 | SM 2540D | 8-13-18 | 8-14-18 | |

| | | | | | | |
|------------------------|-----------------------|-----|----------|---------|---------|--|
| Client ID: | TOSMO-20180808 | | | | | |
| Laboratory ID: | 08-097-12 | | | | | |
| Total Suspended Solids | 2.8 | 1.0 | SM 2540D | 8-13-18 | 8-14-18 | |

| | | | | | | |
|------------------------|-----------------------|-----|----------|---------|---------|--|
| Client ID: | TYLMI-20180808 | | | | | |
| Laboratory ID: | 08-097-13 | | | | | |
| Total Suspended Solids | 6.2 | 1.0 | SM 2540D | 8-13-18 | 8-14-18 | |

| | | | | | | |
|------------------------|-----------------------|-----|----------|---------|---------|--|
| Client ID: | TYLMO-20180808 | | | | | |
| Laboratory ID: | 08-097-14 | | | | | |
| Total Suspended Solids | 5.4 | 1.0 | SM 2540D | 8-13-18 | 8-14-18 | |



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**TOTAL SUSPENDED SOLIDS
SM 2540D**

Matrix: Water
Units: mg/L

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|------------------------|----------------------|------------|---------------|----------------------|----------------------|--------------|
| Client ID: | QA52-20180808 | | | | | |
| Laboratory ID: | 08-097-15 | | | | | |
| Total Suspended Solids | 14 | 1.0 | SM 2540D | 8-13-18 | 8-14-18 | |



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**TOTAL SUSPENDED SOLIDS
 SM 2540D
 QUALITY CONTROL**

Matrix: Water
 Units: mg/L

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|------------------------|-----------|-----|----------|---------------|---------------|-------|
| METHOD BLANK | | | | | | |
| Laboratory ID: | MB0813W1 | | | | | |
| Total Suspended Solids | ND | 1.0 | SM 2540D | 8-13-18 | 8-14-18 | |

| Analyte | Result | Spike Level | Source Result | Percent Recovery | Recovery Limits | RPD | RPD Limit | Flags |
|------------------------|-------------|-------------|---------------|------------------|-----------------|-----|-----------|-------|
| DUPLICATE | | | | | | | | |
| Laboratory ID: | 08-097-14 | | | | | | | |
| | ORIG | DUP | | | | | | |
| Total Suspended Solids | 5.40 | 6.00 | NA | NA | NA | NA | 11 | 17 |

| | | | | | | | | |
|------------------------|-------------|-----|----|----|--------|----|----|--|
| SPIKE BLANK | | | | | | | | |
| Laboratory ID: | SB0813W1 | | | | | | | |
| | SB | SB | | SB | | | | |
| Total Suspended Solids | 93.0 | 100 | NA | 93 | 76-114 | NA | NA | |



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TURBIDITY
EPA 180.1

Matrix: Water
 Units: NTU

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|-------------------|----------------------|------|-----------|---------------|---------------|-------|
| Client ID: | COLM-20180808 | | | | | |
| Laboratory ID: | 08-097-01 | | | | | |
| Turbidity | 1.3 | 0.10 | EPA 180.1 | 8-9-18 | 8-9-18 | |

| | | | | | | |
|-------------------|-----------------------|------|-----------|--------|--------|--|
| Client ID: | COUMI-20180808 | | | | | |
| Laboratory ID: | 08-097-02 | | | | | |
| Turbidity | 5.5 | 0.10 | EPA 180.1 | 8-9-18 | 8-9-18 | |

| | | | | | | |
|-------------------|-----------------------|------|-----------|--------|--------|--|
| Client ID: | COUMO-20180808 | | | | | |
| Laboratory ID: | 08-097-03 | | | | | |
| Turbidity | 0.94 | 0.10 | EPA 180.1 | 8-9-18 | 8-9-18 | |

| | | | | | | |
|-------------------|-----------------------|------|-----------|--------|--------|--|
| Client ID: | EVAMS-20180808 | | | | | |
| Laboratory ID: | 08-097-04 | | | | | |
| Turbidity | 2.9 | 0.10 | EPA 180.1 | 8-9-18 | 8-9-18 | |

| | | | | | | |
|-------------------|------------------------|------|-----------|--------|--------|--|
| Client ID: | EVALSS-20180808 | | | | | |
| Laboratory ID: | 08-097-05 | | | | | |
| Turbidity | 2.0 | 0.10 | EPA 180.1 | 8-9-18 | 8-9-18 | |

| | | | | | | |
|-------------------|-----------------------|------|-----------|--------|--------|--|
| Client ID: | MONMN-20180808 | | | | | |
| Laboratory ID: | 08-097-06 | | | | | |
| Turbidity | 0.99 | 0.10 | EPA 180.1 | 8-9-18 | 8-9-18 | |

| | | | | | | |
|-------------------|-----------------------|------|-----------|--------|--------|--|
| Client ID: | MONMS-20180808 | | | | | |
| Laboratory ID: | 08-097-07 | | | | | |
| Turbidity | 0.71 | 0.10 | EPA 180.1 | 8-9-18 | 8-9-18 | |



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TURBIDITY
EPA 180.1

Matrix: Water
 Units: NTU

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|-------------------|----------------------|------|-----------|---------------|---------------|-------|
| Client ID: | MONM-20180808 | | | | | |
| Laboratory ID: | 08-097-08 | | | | | |
| Turbidity | 7.9 | 0.10 | EPA 180.1 | 8-9-18 | 8-9-18 | |

| | | | | | | |
|-------------------|-----------------------|------|-----------|--------|--------|--|
| Client ID: | SEIMN-20180808 | | | | | |
| Laboratory ID: | 08-097-09 | | | | | |
| Turbidity | 1.9 | 0.10 | EPA 180.1 | 8-9-18 | 8-9-18 | |

| | | | | | | |
|-------------------|-----------------------|------|-----------|--------|--------|--|
| Client ID: | SEIMS-20180808 | | | | | |
| Laboratory ID: | 08-097-10 | | | | | |
| Turbidity | 3.0 | 0.10 | EPA 180.1 | 8-9-18 | 8-9-18 | |

| | | | | | | |
|-------------------|-----------------------|------|-----------|--------|--------|--|
| Client ID: | TOSMI-20180808 | | | | | |
| Laboratory ID: | 08-097-11 | | | | | |
| Turbidity | 1.1 | 0.10 | EPA 180.1 | 8-9-18 | 8-9-18 | |

| | | | | | | |
|-------------------|-----------------------|------|-----------|--------|--------|--|
| Client ID: | TOSMO-20180808 | | | | | |
| Laboratory ID: | 08-097-12 | | | | | |
| Turbidity | 0.77 | 0.10 | EPA 180.1 | 8-9-18 | 8-9-18 | |

| | | | | | | |
|-------------------|-----------------------|------|-----------|--------|--------|--|
| Client ID: | TYLMI-20180808 | | | | | |
| Laboratory ID: | 08-097-13 | | | | | |
| Turbidity | 1.2 | 0.10 | EPA 180.1 | 8-9-18 | 8-9-18 | |

| | | | | | | |
|-------------------|-----------------------|------|-----------|--------|--------|--|
| Client ID: | TYLMO-20180808 | | | | | |
| Laboratory ID: | 08-097-14 | | | | | |
| Turbidity | 1.4 | 0.10 | EPA 180.1 | 8-9-18 | 8-9-18 | |



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TURBIDITY
EPA 180.1

Matrix: Water
Units: NTU

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|-------------------|----------------------|------------|---------------|----------------------|----------------------|--------------|
| Client ID: | QA52-20180808 | | | | | |
| Laboratory ID: | 08-097-15 | | | | | |
| Turbidity | 7.5 | 0.10 | EPA 180.1 | 8-9-18 | 8-9-18 | |



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**TURBIDITY
 EPA 180.1
 QUALITY CONTROL**

Matrix: Water
 Units: NTU

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|---------------------|-----------|------|-----------|---------------|---------------|-------|
| METHOD BLANK | | | | | | |
| Laboratory ID: | MB0809W1 | | | | | |
| Turbidity | ND | 0.10 | EPA 180.1 | 8-9-18 | 8-9-18 | |

| Analyte | Result | Spike Level | Source Result | Percent Recovery | Recovery Limits | RPD | RPD Limit | Flags |
|------------------|--------------|--------------|---------------|------------------|-----------------|-----|-----------|-------|
| DUPLICATE | | | | | | | | |
| Laboratory ID: | 08-097-03 | | | | | | | |
| | ORIG | DUP | | | | | | |
| Turbidity | 0.940 | 0.960 | NA | NA | NA | NA | 2 | 15 |



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HARDNESS
EPA 200.7/SM 2340B

Matrix: Water
 Units: mg eqt. CaCO₃/L (ppm)

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|-------------------|----------------------|-----|----------------|---------------|---------------|-------|
| Client ID: | COLM-20180808 | | | | | |
| Laboratory ID: | 08-097-01 | | | | | |
| Hardness | 27 | 1.0 | 200.7/SM 2340B | 8-9-18 | 8-9-18 | |

| | | | | | | |
|-------------------|-----------------------|-----|----------------|--------|--------|--|
| Client ID: | COUMI-20180808 | | | | | |
| Laboratory ID: | 08-097-02 | | | | | |
| Hardness | 160 | 1.0 | 200.7/SM 2340B | 8-9-18 | 8-9-18 | |

| | | | | | | |
|-------------------|-----------------------|-----|----------------|--------|--------|--|
| Client ID: | COUMO-20180808 | | | | | |
| Laboratory ID: | 08-097-03 | | | | | |
| Hardness | 120 | 1.0 | 200.7/SM 2340B | 8-9-18 | 8-9-18 | |

| | | | | | | |
|-------------------|-----------------------|-----|----------------|--------|--------|--|
| Client ID: | EVAMS-20180808 | | | | | |
| Laboratory ID: | 08-097-04 | | | | | |
| Hardness | 100 | 1.0 | 200.7/SM 2340B | 8-9-18 | 8-9-18 | |

| | | | | | | |
|-------------------|------------------------|-----|----------------|--------|--------|--|
| Client ID: | EVALSS-20180808 | | | | | |
| Laboratory ID: | 08-097-05 | | | | | |
| Hardness | 91 | 1.0 | 200.7/SM 2340B | 8-9-18 | 8-9-18 | |

| | | | | | | |
|-------------------|-----------------------|-----|----------------|--------|--------|--|
| Client ID: | MONMN-20180808 | | | | | |
| Laboratory ID: | 08-097-06 | | | | | |
| Hardness | 99 | 1.0 | 200.7/SM 2340B | 8-9-18 | 8-9-18 | |

| | | | | | | |
|-------------------|-----------------------|-----|----------------|--------|--------|--|
| Client ID: | MONMS-20180808 | | | | | |
| Laboratory ID: | 08-097-07 | | | | | |
| Hardness | 180 | 1.0 | 200.7/SM 2340B | 8-9-18 | 8-9-18 | |



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 Project: 14-05806-000

HARDNESS
EPA 200.7/SM 2340B

Matrix: Water
 Units: mg eqt. CaCO₃/L (ppm)

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|-------------------|----------------------|-----|----------------|---------------|---------------|-------|
| Client ID: | MONM-20180808 | | | | | |
| Laboratory ID: | 08-097-08 | | | | | |
| Hardness | 100 | 1.0 | 200.7/SM 2340B | 8-9-18 | 8-9-18 | |

| | | | | | | |
|-------------------|-----------------------|-----|----------------|--------|--------|--|
| Client ID: | SEIMN-20180808 | | | | | |
| Laboratory ID: | 08-097-09 | | | | | |
| Hardness | 47 | 1.0 | 200.7/SM 2340B | 8-9-18 | 8-9-18 | |

| | | | | | | |
|-------------------|-----------------------|-----|----------------|--------|--------|--|
| Client ID: | SEIMS-20180808 | | | | | |
| Laboratory ID: | 08-097-10 | | | | | |
| Hardness | 55 | 1.0 | 200.7/SM 2340B | 8-9-18 | 8-9-18 | |

| | | | | | | |
|-------------------|-----------------------|-----|----------------|--------|--------|--|
| Client ID: | TOSMI-20180808 | | | | | |
| Laboratory ID: | 08-097-11 | | | | | |
| Hardness | 140 | 1.0 | 200.7/SM 2340B | 8-9-18 | 8-9-18 | |

| | | | | | | |
|-------------------|-----------------------|-----|----------------|--------|--------|--|
| Client ID: | TOSMO-20180808 | | | | | |
| Laboratory ID: | 08-097-12 | | | | | |
| Hardness | 120 | 1.0 | 200.7/SM 2340B | 8-9-18 | 8-9-18 | |

| | | | | | | |
|-------------------|-----------------------|-----|----------------|--------|--------|--|
| Client ID: | TYLMI-20180808 | | | | | |
| Laboratory ID: | 08-097-13 | | | | | |
| Hardness | 120 | 1.0 | 200.7/SM 2340B | 8-9-18 | 8-9-18 | |

| | | | | | | |
|-------------------|-----------------------|-----|----------------|--------|--------|--|
| Client ID: | TYLMO-20180808 | | | | | |
| Laboratory ID: | 08-097-14 | | | | | |
| Hardness | 98 | 1.0 | 200.7/SM 2340B | 8-9-18 | 8-9-18 | |



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HARDNESS
EPA 200.7/SM 2340B

Matrix: Water
Units: mg eqt. CaCO₃/L (ppm)

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|-------------------|----------------------|------------|----------------|----------------------|----------------------|--------------|
| Client ID: | QA52-20180808 | | | | | |
| Laboratory ID: | 08-097-15 | | | | | |
| Hardness | 110 | 1.0 | 200.7/SM 2340B | 8-9-18 | 8-10-18 | |



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**HARDNESS
 EPA 200.7/SM 2340B
 QUALITY CONTROL**

Matrix: Water
 Units: mg eqt. CaCO₃/L (ppm)

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|---------------------|-----------|-----|----------------|---------------|---------------|-------|
| METHOD BLANK | | | | | | |
| Laboratory ID: | MB0809WH2 | | | | | |
| Hardness | ND | 1.0 | 200.7/SM 2340B | 8-9-18 | 8-9-18 | |

| Analyte | Result | Spike Level | Source Result | Percent Recovery | Recovery Limits | RPD | RPD Limit | Flags |
|------------------|-------------|-------------|---------------|------------------|-----------------|-----|-----------|-------|
| DUPLICATE | | | | | | | | |
| Laboratory ID: | 08-097-01 | | | | | | | |
| | ORIG | DUP | | | | | | |
| Hardness | 27.0 | 27.0 | NA | NA | NA | 0 | 20 | |

| Analyte | Result | Spike Level | Source Result | Percent Recovery | Recovery Limits | RPD | RPD Limit | Flags | | |
|----------------------|------------|-------------|---------------|------------------|-----------------|-----|-----------|--------|---|----|
| MATRIX SPIKES | | | | | | | | | | |
| Laboratory ID: | 08-097-01 | | | | | | | | | |
| | MS | MSD | MS | MSD | MS | MSD | | | | |
| Hardness | 161 | 159 | 132 | 132 | 27.0 | 102 | 100 | 75-125 | 1 | 20 |

| Analyte | Result | Spike Level | Source Result | Percent Recovery | Recovery Limits | RPD | RPD Limit | Flags |
|--------------------|------------|-------------|---------------|------------------|-----------------|-----|-----------|-------|
| SPIKE BLANK | | | | | | | | |
| Laboratory ID: | SB0809WH2 | | | | | | | |
| | SB | SB | | | SB | | | |
| Hardness | 130 | 132 | NA | 98 | 80-120 | NA | NA | |



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**DISSOLVED ORGANIC CARBON
 SM 5310B**

Matrix: Water
 Units: mg/L

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|--------------------------|----------------------|-----|----------|---------------|---------------|-------|
| Client ID: | COLM-20180808 | | | | | |
| Laboratory ID: | 08-097-01 | | | | | |
| Dissolved Organic Carbon | 7.2 | 1.0 | SM 5310B | 8-13-18 | 8-13-18 | |

| | | | | | | |
|--------------------------|-----------------------|-----|----------|---------|---------|--|
| Client ID: | COUMI-20180808 | | | | | |
| Laboratory ID: | 08-097-02 | | | | | |
| Dissolved Organic Carbon | 2.5 | 1.0 | SM 5310B | 8-13-18 | 8-13-18 | |

| | | | | | | |
|--------------------------|-----------------------|-----|----------|---------|---------|--|
| Client ID: | COUMO-20180808 | | | | | |
| Laboratory ID: | 08-097-03 | | | | | |
| Dissolved Organic Carbon | 2.1 | 1.0 | SM 5310B | 8-13-18 | 8-13-18 | |

| | | | | | | |
|--------------------------|-----------------------|-----|----------|---------|---------|--|
| Client ID: | EVAMS-20180808 | | | | | |
| Laboratory ID: | 08-097-04 | | | | | |
| Dissolved Organic Carbon | 1.9 | 1.0 | SM 5310B | 8-13-18 | 8-13-18 | |

| | | | | | | |
|--------------------------|------------------------|-----|----------|---------|---------|--|
| Client ID: | EVALSS-20180808 | | | | | |
| Laboratory ID: | 08-097-05 | | | | | |
| Dissolved Organic Carbon | 1.6 | 1.0 | SM 5310B | 8-13-18 | 8-13-18 | |

| | | | | | | |
|--------------------------|-----------------------|-----|----------|---------|---------|--|
| Client ID: | MONMN-20180808 | | | | | |
| Laboratory ID: | 08-097-06 | | | | | |
| Dissolved Organic Carbon | 3.8 | 1.0 | SM 5310B | 8-13-18 | 8-13-18 | |

| | | | | | | |
|--------------------------|-----------------------|-----|----------|---------|---------|--|
| Client ID: | MONMS-20180808 | | | | | |
| Laboratory ID: | 08-097-07 | | | | | |
| Dissolved Organic Carbon | 4.1 | 1.0 | SM 5310B | 8-13-18 | 8-13-18 | |



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**DISSOLVED ORGANIC CARBON
 SM 5310B**

Matrix: Water
 Units: mg/L

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|--------------------------|----------------------|-----|----------|---------------|---------------|-------|
| Client ID: | MONM-20180808 | | | | | |
| Laboratory ID: | 08-097-08 | | | | | |
| Dissolved Organic Carbon | 2.7 | 1.0 | SM 5310B | 8-13-18 | 8-13-18 | |

| | | | | | | |
|--------------------------|-----------------------|-----|----------|---------|---------|--|
| Client ID: | SEIMN-20180808 | | | | | |
| Laboratory ID: | 08-097-09 | | | | | |
| Dissolved Organic Carbon | 1.4 | 1.0 | SM 5310B | 8-13-18 | 8-13-18 | |

| | | | | | | |
|--------------------------|-----------------------|-----|----------|---------|---------|--|
| Client ID: | SEIMS-20180808 | | | | | |
| Laboratory ID: | 08-097-10 | | | | | |
| Dissolved Organic Carbon | 2.6 | 1.0 | SM 5310B | 8-13-18 | 8-13-18 | |

| | | | | | | |
|--------------------------|-----------------------|-----|----------|---------|---------|--|
| Client ID: | TOSMI-20180808 | | | | | |
| Laboratory ID: | 08-097-11 | | | | | |
| Dissolved Organic Carbon | 2.5 | 1.0 | SM 5310B | 8-13-18 | 8-13-18 | |

| | | | | | | |
|--------------------------|-----------------------|-----|----------|---------|---------|--|
| Client ID: | TOSMO-20180808 | | | | | |
| Laboratory ID: | 08-097-12 | | | | | |
| Dissolved Organic Carbon | 1.5 | 1.0 | SM 5310B | 8-13-18 | 8-13-18 | |

| | | | | | | |
|--------------------------|-----------------------|-----|----------|---------|---------|--|
| Client ID: | TYLMI-20180808 | | | | | |
| Laboratory ID: | 08-097-13 | | | | | |
| Dissolved Organic Carbon | 1.9 | 1.0 | SM 5310B | 8-13-18 | 8-13-18 | |

| | | | | | | |
|--------------------------|-----------------------|-----|----------|---------|---------|--|
| Client ID: | TYLMO-20180808 | | | | | |
| Laboratory ID: | 08-097-14 | | | | | |
| Dissolved Organic Carbon | 3.3 | 1.0 | SM 5310B | 8-13-18 | 8-13-18 | |



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**DISSOLVED ORGANIC CARBON
SM 5310B**

Matrix: Water
Units: mg/L

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|--------------------------|----------------------|------------|---------------|----------------------|----------------------|--------------|
| Client ID: | QA52-20180808 | | | | | |
| Laboratory ID: | 08-097-15 | | | | | |
| Dissolved Organic Carbon | 3.2 | 1.0 | SM 5310B | 8-13-18 | 8-13-18 | |



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**DISSOLVED ORGANIC CARBON
 SM 5310B
 QUALITY CONTROL**

Matrix: Water
 Units: mg/L

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|--------------------------|-----------|-----|----------|---------------|---------------|-------|
| METHOD BLANK | | | | | | |
| Laboratory ID: | MB0813D1 | | | | | |
| Dissolved Organic Carbon | ND | 1.0 | SM 5310B | 8-13-18 | 8-13-18 | |

| Analyte | Result | Spike Level | Source Result | Percent Recovery | Recovery Limits | RPD | RPD Limit | Flags |
|--------------------------|-------------|-------------|---------------|------------------|-----------------|-----|-----------|-------|
| DUPLICATE | | | | | | | | |
| Laboratory ID: | 08-097-01 | | | | | | | |
| | ORIG | DUP | | | | | | |
| Dissolved Organic Carbon | 7.23 | 7.36 | NA | NA | NA | 2 | 15 | |

MATRIX SPIKE

| | | | | | | | | |
|--------------------------|-------------|------|------|-----|--------|----|----|--|
| Laboratory ID: | 08-097-01 | | | | | | | |
| | MS | MS | | MS | | | | |
| Dissolved Organic Carbon | 18.6 | 10.0 | 7.23 | 114 | 75-125 | NA | NA | |

SPIKE BLANK

| | | | | | | | | |
|--------------------------|-------------|------|----|-----|--------|----|----|--|
| Laboratory ID: | SB0813D1 | | | | | | | |
| | SB | SB | | SB | | | | |
| Dissolved Organic Carbon | 11.2 | 10.0 | NA | 112 | 80-120 | NA | NA | |



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TOTAL PHOSPHORUS
EPA 365.1

Matrix: Water
 Units: mg/L

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|-------------------|----------------------|-------|-----------|---------------|---------------|-------|
| Client ID: | COLM-20180808 | | | | | |
| Laboratory ID: | 08-097-01 | | | | | |
| Total Phosphorus | 0.041 | 0.010 | EPA 365.1 | 8-13-18 | 8-16-18 | |

| | | | | | | |
|-------------------|-----------------------|-------|-----------|---------|---------|--|
| Client ID: | COUMI-20180808 | | | | | |
| Laboratory ID: | 08-097-02 | | | | | |
| Total Phosphorus | 0.15 | 0.010 | EPA 365.1 | 8-13-18 | 8-16-18 | |

| | | | | | | |
|-------------------|-----------------------|-------|-----------|---------|---------|--|
| Client ID: | COUMO-20180808 | | | | | |
| Laboratory ID: | 08-097-03 | | | | | |
| Total Phosphorus | 0.080 | 0.010 | EPA 365.1 | 8-13-18 | 8-16-18 | |

| | | | | | | |
|-------------------|-----------------------|-------|-----------|---------|---------|--|
| Client ID: | EVAMS-20180808 | | | | | |
| Laboratory ID: | 08-097-04 | | | | | |
| Total Phosphorus | 0.043 | 0.010 | EPA 365.1 | 8-13-18 | 8-16-18 | |

| | | | | | | |
|-------------------|------------------------|-------|-----------|---------|---------|--|
| Client ID: | EVALSS-20180808 | | | | | |
| Laboratory ID: | 08-097-05 | | | | | |
| Total Phosphorus | 0.041 | 0.010 | EPA 365.1 | 8-13-18 | 8-16-18 | |

| | | | | | | |
|-------------------|-----------------------|-------|-----------|---------|---------|--|
| Client ID: | MONMN-20180808 | | | | | |
| Laboratory ID: | 08-097-06 | | | | | |
| Total Phosphorus | 0.15 | 0.010 | EPA 365.1 | 8-13-18 | 8-16-18 | |

| | | | | | | |
|-------------------|-----------------------|-------|-----------|---------|---------|--|
| Client ID: | MONMS-20180808 | | | | | |
| Laboratory ID: | 08-097-07 | | | | | |
| Total Phosphorus | 0.030 | 0.010 | EPA 365.1 | 8-13-18 | 8-16-18 | |



Date of Report: August 25, 2018
 Samples Submitted: August 8, 2018
 Laboratory Reference: 1808-097
 Project: 14-05806-000

TOTAL PHOSPHORUS
EPA 365.1

Matrix: Water
 Units: mg/L

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|-------------------|----------------------|-------|-----------|---------------|---------------|-------|
| Client ID: | MONM-20180808 | | | | | |
| Laboratory ID: | 08-097-08 | | | | | |
| Total Phosphorus | 0.088 | 0.010 | EPA 365.1 | 8-13-18 | 8-16-18 | |

| | | | | | | |
|-------------------|-----------------------|-------|-----------|---------|---------|--|
| Client ID: | SEIMN-20180808 | | | | | |
| Laboratory ID: | 08-097-09 | | | | | |
| Total Phosphorus | 0.051 | 0.010 | EPA 365.1 | 8-13-18 | 8-16-18 | |

| | | | | | | |
|-------------------|-----------------------|-------|-----------|---------|---------|--|
| Client ID: | SEIMS-20180808 | | | | | |
| Laboratory ID: | 08-097-10 | | | | | |
| Total Phosphorus | 0.059 | 0.010 | EPA 365.1 | 8-13-18 | 8-16-18 | |

| | | | | | | |
|-------------------|-----------------------|-------|-----------|---------|---------|--|
| Client ID: | TOSMI-20180808 | | | | | |
| Laboratory ID: | 08-097-11 | | | | | |
| Total Phosphorus | 0.086 | 0.010 | EPA 365.1 | 8-13-18 | 8-16-18 | |

| | | | | | | |
|-------------------|-----------------------|-------|-----------|---------|---------|--|
| Client ID: | TOSMO-20180808 | | | | | |
| Laboratory ID: | 08-097-12 | | | | | |
| Total Phosphorus | 0.083 | 0.010 | EPA 365.1 | 8-13-18 | 8-16-18 | |

| | | | | | | |
|-------------------|-----------------------|-------|-----------|---------|---------|--|
| Client ID: | TYLMI-20180808 | | | | | |
| Laboratory ID: | 08-097-13 | | | | | |
| Total Phosphorus | 0.048 | 0.010 | EPA 365.1 | 8-13-18 | 8-16-18 | |

| | | | | | | |
|-------------------|-----------------------|-------|-----------|---------|---------|--|
| Client ID: | TYLMO-20180808 | | | | | |
| Laboratory ID: | 08-097-14 | | | | | |
| Total Phosphorus | 0.099 | 0.010 | EPA 365.1 | 8-13-18 | 8-16-18 | |



Date of Report: August 25, 2018
Samples Submitted: August 8, 2018
Laboratory Reference: 1808-097
Project: 14-05806-000

TOTAL PHOSPHORUS
EPA 365.1

Matrix: Water
Units: mg/L

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|-------------------|----------------------|------------|---------------|----------------------|----------------------|--------------|
| Client ID: | QA52-20180808 | | | | | |
| Laboratory ID: | 08-097-15 | | | | | |
| Total Phosphorus | 0.085 | 0.010 | EPA 365.1 | 8-13-18 | 8-16-18 | |



Date of Report: August 25, 2018
 Samples Submitted: August 8, 2018
 Laboratory Reference: 1808-097
 Project: 14-05806-000

**TOTAL PHOSPHORUS
 EPA 365.1
 QUALITY CONTROL**

Matrix: Water
 Units: mg/L

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|---------------------|-----------|-------|-----------|---------------|---------------|-------|
| METHOD BLANK | | | | | | |
| Laboratory ID: | MB0813W1 | | | | | |
| Total Phosphorus | ND | 0.010 | EPA 365.1 | 8-13-18 | 8-16-18 | |

| Analyte | Result | Spike Level | Source Result | Percent Recovery | Recovery Limits | RPD | RPD Limit | Flags |
|------------------|---------------|---------------|---------------|------------------|-----------------|-----|-----------|-------|
| DUPLICATE | | | | | | | | |
| Laboratory ID: | 08-097-01 | | | | | | | |
| | ORIG | DUP | | | | | | |
| Total Phosphorus | 0.0411 | 0.0446 | NA | NA | NA | 8 | 12 | |

| | | | | | | | | |
|---------------------|--------------|-------|--------|----|--------|----|----|--|
| MATRIX SPIKE | | | | | | | | |
| Laboratory ID: | 08-097-01 | | | | | | | |
| | MS | MS | | MS | | | | |
| Total Phosphorus | 0.268 | 0.250 | 0.0411 | 91 | 83-114 | NA | NA | |

| | | | | | | | | |
|--------------------|--------------|-------|----|----|--------|----|----|--|
| SPIKE BLANK | | | | | | | | |
| Laboratory ID: | SB0813W1 | | | | | | | |
| | SB | SB | | SB | | | | |
| Total Phosphorus | 0.207 | 0.250 | NA | 83 | 83-114 | NA | NA | |



Date of Report: August 25, 2018
 Samples Submitted: August 8, 2018
 Laboratory Reference: 1808-097
 Project: 14-05806-000

TOTAL METALS
EPA 200.8

Matrix: Water
 Units: ug/L (ppb)

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|-------------------|----------------------|-----|-----------|---------------|---------------|-------|
| Client ID: | COLM-20180808 | | | | | |
| Laboratory ID: | 08-097-01 | | | | | |
| Copper | ND | 1.0 | EPA 200.8 | 8-10-18 | 8-10-18 | |
| Zinc | 6.3 | 5.0 | EPA 200.8 | 8-10-18 | 8-10-18 | |

| | | | | | | |
|-------------------|-----------------------|-----|-----------|---------|---------|--|
| Client ID: | COUMI-20180808 | | | | | |
| Laboratory ID: | 08-097-02 | | | | | |
| Copper | ND | 1.0 | EPA 200.8 | 8-10-18 | 8-10-18 | |
| Zinc | 5.2 | 5.0 | EPA 200.8 | 8-10-18 | 8-10-18 | |

| | | | | | | |
|-------------------|-----------------------|-----|-----------|---------|---------|--|
| Client ID: | COUMO-20180808 | | | | | |
| Laboratory ID: | 08-097-03 | | | | | |
| Copper | ND | 1.0 | EPA 200.8 | 8-10-18 | 8-10-18 | |
| Zinc | 5.1 | 5.0 | EPA 200.8 | 8-10-18 | 8-10-18 | |

| | | | | | | |
|-------------------|-----------------------|-----|-----------|---------|---------|--|
| Client ID: | EVAMS-20180808 | | | | | |
| Laboratory ID: | 08-097-04 | | | | | |
| Copper | ND | 1.0 | EPA 200.8 | 8-10-18 | 8-10-18 | |
| Zinc | ND | 5.0 | EPA 200.8 | 8-10-18 | 8-10-18 | |

| | | | | | | |
|-------------------|------------------------|-----|-----------|---------|---------|--|
| Client ID: | EVALSS-20180808 | | | | | |
| Laboratory ID: | 08-097-05 | | | | | |
| Copper | ND | 1.0 | EPA 200.8 | 8-10-18 | 8-10-18 | |
| Zinc | ND | 5.0 | EPA 200.8 | 8-10-18 | 8-10-18 | |

| | | | | | | |
|-------------------|-----------------------|-----|-----------|---------|---------|--|
| Client ID: | MONMN-20180808 | | | | | |
| Laboratory ID: | 08-097-06 | | | | | |
| Copper | ND | 1.0 | EPA 200.8 | 8-10-18 | 8-10-18 | |
| Zinc | 5.8 | 5.0 | EPA 200.8 | 8-10-18 | 8-10-18 | |

| | | | | | | |
|-------------------|-----------------------|-----|-----------|---------|---------|--|
| Client ID: | MONMS-20180808 | | | | | |
| Laboratory ID: | 08-097-07 | | | | | |
| Copper | ND | 1.0 | EPA 200.8 | 8-10-18 | 8-10-18 | |
| Zinc | ND | 5.0 | EPA 200.8 | 8-10-18 | 8-10-18 | |



Date of Report: August 25, 2018
 Samples Submitted: August 8, 2018
 Laboratory Reference: 1808-097
 Project: 14-05806-000

TOTAL METALS
EPA 200.8

Matrix: Water
 Units: ug/L (ppb)

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|-------------------|----------------------|-----|-----------|---------------|---------------|-------|
| Client ID: | MONM-20180808 | | | | | |
| Laboratory ID: | 08-097-08 | | | | | |
| Copper | ND | 1.0 | EPA 200.8 | 8-10-18 | 8-10-18 | |
| Zinc | 12 | 5.0 | EPA 200.8 | 8-10-18 | 8-10-18 | |

| | | | | | | |
|-------------------|-----------------------|-----|-----------|---------|---------|--|
| Client ID: | SEIMN-20180808 | | | | | |
| Laboratory ID: | 08-097-09 | | | | | |
| Copper | ND | 1.0 | EPA 200.8 | 8-10-18 | 8-10-18 | |
| Zinc | ND | 5.0 | EPA 200.8 | 8-10-18 | 8-10-18 | |

| | | | | | | |
|-------------------|-----------------------|-----|-----------|---------|---------|--|
| Client ID: | SEIMS-20180808 | | | | | |
| Laboratory ID: | 08-097-10 | | | | | |
| Copper | ND | 1.0 | EPA 200.8 | 8-10-18 | 8-10-18 | |
| Zinc | ND | 5.0 | EPA 200.8 | 8-10-18 | 8-10-18 | |

| | | | | | | |
|-------------------|-----------------------|-----|-----------|---------|---------|--|
| Client ID: | TOSMI-20180808 | | | | | |
| Laboratory ID: | 08-097-11 | | | | | |
| Copper | 1.3 | 1.0 | EPA 200.8 | 8-10-18 | 8-10-18 | |
| Zinc | 14 | 5.0 | EPA 200.8 | 8-10-18 | 8-10-18 | |

| | | | | | | |
|-------------------|-----------------------|-----|-----------|---------|---------|--|
| Client ID: | TOSMO-20180808 | | | | | |
| Laboratory ID: | 08-097-12 | | | | | |
| Copper | ND | 1.0 | EPA 200.8 | 8-10-18 | 8-10-18 | |
| Zinc | ND | 5.0 | EPA 200.8 | 8-10-18 | 8-10-18 | |

| | | | | | | |
|-------------------|-----------------------|-----|-----------|---------|---------|--|
| Client ID: | TYLMI-20180808 | | | | | |
| Laboratory ID: | 08-097-13 | | | | | |
| Copper | 2.1 | 1.0 | EPA 200.8 | 8-10-18 | 8-10-18 | |
| Zinc | 13 | 5.0 | EPA 200.8 | 8-10-18 | 8-10-18 | |

| | | | | | | |
|-------------------|-----------------------|-----|-----------|---------|---------|--|
| Client ID: | TYLMO-20180808 | | | | | |
| Laboratory ID: | 08-097-14 | | | | | |
| Copper | ND | 1.0 | EPA 200.8 | 8-10-18 | 8-10-18 | |
| Zinc | ND | 5.0 | EPA 200.8 | 8-10-18 | 8-10-18 | |



Date of Report: August 25, 2018
Samples Submitted: August 8, 2018
Laboratory Reference: 1808-097
Project: 14-05806-000

TOTAL METALS
EPA 200.8

Matrix: Water
Units: ug/L (ppb)

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|-------------------|----------------------|------------|---------------|----------------------|----------------------|--------------|
| Client ID: | QA52-20180808 | | | | | |
| Laboratory ID: | 08-097-15 | | | | | |
| Copper | 1.0 | 1.0 | EPA 200.8 | 8-10-18 | 8-10-18 | |
| Zinc | 14 | 5.0 | EPA 200.8 | 8-10-18 | 8-10-18 | |



Date of Report: August 25, 2018
 Samples Submitted: August 8, 2018
 Laboratory Reference: 1808-097
 Project: 14-05806-000

**TOTAL METALS
 EPA 200.8
 QUALITY CONTROL**

Matrix: Water
 Units: ug/L (ppb)

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|---------------------|-----------|-----|-----------|---------------|---------------|-------|
| METHOD BLANK | | | | | | |
| Laboratory ID: | MB0810WH1 | | | | | |
| Copper | ND | 1.0 | EPA 200.8 | 8-10-18 | 8-10-18 | |
| Zinc | ND | 5.0 | EPA 200.8 | 8-10-18 | 8-10-18 | |

| Analyte | Result | Spike Level | Source Result | Percent Recovery | Recovery Limits | RPD | RPD Limit | Flags |
|------------------|-------------|-------------|---------------|------------------|-----------------|-----|-----------|-------|
| DUPLICATE | | | | | | | | |
| Laboratory ID: | 08-097-03 | | | | | | | |
| | ORIG | DUP | | | | | | |
| Copper | ND | ND | NA | NA | NA | NA | 20 | |
| Zinc | 5.08 | ND | NA | NA | NA | NA | 20 | |

MATRIX SPIKES

| | | | | | | | | | | |
|----------------|-------------|-------------|-----|-----|------|------------|------------|--------|---|----|
| Laboratory ID: | 08-097-03 | | | | | | | | | |
| | MS | MSD | MS | MSD | | MS | MSD | | | |
| Copper | 86.2 | 83.6 | 100 | 100 | ND | 86 | 84 | 75-125 | 3 | 20 |
| Zinc | 114 | 114 | 100 | 100 | 5.08 | 109 | 109 | 75-125 | 0 | 20 |



Date of Report: August 25, 2018
 Samples Submitted: August 8, 2018
 Laboratory Reference: 1808-097
 Project: 14-05806-000

**DISSOLVED METALS
 EPA 200.8**

Matrix: Water
 Units: ug/L (ppb)

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|-------------------|----------------------|-----|-----------|---------------|---------------|-------|
| Client ID: | COLM-20180808 | | | | | |
| Laboratory ID: | 08-097-01 | | | | | |
| Copper | ND | 1.0 | EPA 200.8 | | 8-9-18 | |
| Zinc | ND | 5.0 | EPA 200.8 | | 8-9-18 | |

| | | | | | | |
|-------------------|-----------------------|-----|-----------|--|--------|--|
| Client ID: | COUMI-20180808 | | | | | |
| Laboratory ID: | 08-097-02 | | | | | |
| Copper | ND | 1.0 | EPA 200.8 | | 8-9-18 | |
| Zinc | ND | 5.0 | EPA 200.8 | | 8-9-18 | |

| | | | | | | |
|-------------------|-----------------------|-----|-----------|--|--------|--|
| Client ID: | COUMO-20180808 | | | | | |
| Laboratory ID: | 08-097-03 | | | | | |
| Copper | ND | 1.0 | EPA 200.8 | | 8-9-18 | |
| Zinc | ND | 5.0 | EPA 200.8 | | 8-9-18 | |

| | | | | | | |
|-------------------|-----------------------|-----|-----------|--|--------|--|
| Client ID: | EVAMS-20180808 | | | | | |
| Laboratory ID: | 08-097-04 | | | | | |
| Copper | ND | 1.0 | EPA 200.8 | | 8-9-18 | |
| Zinc | ND | 5.0 | EPA 200.8 | | 8-9-18 | |

| | | | | | | |
|-------------------|------------------------|-----|-----------|--|--------|--|
| Client ID: | EVALSS-20180808 | | | | | |
| Laboratory ID: | 08-097-05 | | | | | |
| Copper | ND | 1.0 | EPA 200.8 | | 8-9-18 | |
| Zinc | ND | 5.0 | EPA 200.8 | | 8-9-18 | |

| | | | | | | |
|-------------------|-----------------------|-----|-----------|--|--------|--|
| Client ID: | MONMN-20180808 | | | | | |
| Laboratory ID: | 08-097-06 | | | | | |
| Copper | ND | 1.0 | EPA 200.8 | | 8-9-18 | |
| Zinc | ND | 5.0 | EPA 200.8 | | 8-9-18 | |

| | | | | | | |
|-------------------|-----------------------|-----|-----------|--|--------|--|
| Client ID: | MONMS-20180808 | | | | | |
| Laboratory ID: | 08-097-07 | | | | | |
| Copper | ND | 1.0 | EPA 200.8 | | 8-9-18 | |
| Zinc | ND | 5.0 | EPA 200.8 | | 8-9-18 | |



Date of Report: August 25, 2018
 Samples Submitted: August 8, 2018
 Laboratory Reference: 1808-097
 Project: 14-05806-000

**DISSOLVED METALS
 EPA 200.8**

Matrix: Water
 Units: ug/L (ppb)

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|-------------------|----------------------|-----|-----------|---------------|---------------|-------|
| Client ID: | MONM-20180808 | | | | | |
| Laboratory ID: | 08-097-08 | | | | | |
| Copper | ND | 1.0 | EPA 200.8 | | 8-9-18 | |
| Zinc | ND | 5.0 | EPA 200.8 | | 8-9-18 | |

| | | | | | | |
|-------------------|-----------------------|-----|-----------|--|--------|--|
| Client ID: | SEIMN-20180808 | | | | | |
| Laboratory ID: | 08-097-09 | | | | | |
| Copper | ND | 1.0 | EPA 200.8 | | 8-9-18 | |
| Zinc | ND | 5.0 | EPA 200.8 | | 8-9-18 | |

| | | | | | | |
|-------------------|-----------------------|-----|-----------|--|--------|--|
| Client ID: | SEIMS-20180808 | | | | | |
| Laboratory ID: | 08-097-10 | | | | | |
| Copper | ND | 1.0 | EPA 200.8 | | 8-9-18 | |
| Zinc | ND | 5.0 | EPA 200.8 | | 8-9-18 | |

| | | | | | | |
|-------------------|-----------------------|-----|-----------|--|--------|--|
| Client ID: | TOSMI-20180808 | | | | | |
| Laboratory ID: | 08-097-11 | | | | | |
| Copper | ND | 1.0 | EPA 200.8 | | 8-9-18 | |
| Zinc | 7.8 | 5.0 | EPA 200.8 | | 8-9-18 | |

| | | | | | | |
|-------------------|-----------------------|-----|-----------|--|--------|--|
| Client ID: | TOSMO-20180808 | | | | | |
| Laboratory ID: | 08-097-12 | | | | | |
| Copper | ND | 1.0 | EPA 200.8 | | 8-9-18 | |
| Zinc | ND | 5.0 | EPA 200.8 | | 8-9-18 | |

| | | | | | | |
|-------------------|-----------------------|-----|-----------|--|--------|--|
| Client ID: | TYLMI-20180808 | | | | | |
| Laboratory ID: | 08-097-13 | | | | | |
| Copper | ND | 1.0 | EPA 200.8 | | 8-9-18 | |
| Zinc | ND | 5.0 | EPA 200.8 | | 8-9-18 | |

| | | | | | | |
|-------------------|-----------------------|-----|-----------|--|---------|--|
| Client ID: | TYLMO-20180808 | | | | | |
| Laboratory ID: | 08-097-14 | | | | | |
| Copper | ND | 1.0 | EPA 200.8 | | 8-14-18 | |
| Zinc | ND | 5.0 | EPA 200.8 | | 8-14-18 | |



Date of Report: August 25, 2018
Samples Submitted: August 8, 2018
Laboratory Reference: 1808-097
Project: 14-05806-000

DISSOLVED METALS
EPA 200.8

Matrix: Water
Units: ug/L (ppb)

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|-------------------|----------------------|------------|---------------|----------------------|----------------------|--------------|
| Client ID: | QA52-20180808 | | | | | |
| Laboratory ID: | 08-097-15 | | | | | |
| Copper | ND | 1.0 | EPA 200.8 | | 8-9-18 | |
| Zinc | ND | 5.0 | EPA 200.8 | | 8-9-18 | |



Date of Report: August 25, 2018
 Samples Submitted: August 8, 2018
 Laboratory Reference: 1808-097
 Project: 14-05806-000

**DISSOLVED METALS
 EPA 200.8
 QUALITY CONTROL**

Matrix: Water
 Units: ug/L (ppb)

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|---------------------|-----------|-----|-----------|---------------|---------------|-------|
| METHOD BLANK | | | | | | |
| Laboratory ID: | MB0809D1 | | | | | |
| Copper | ND | 1.0 | EPA 200.8 | | 8-9-18 | |
| Zinc | ND | 5.0 | EPA 200.8 | | 8-9-18 | |

| Analyte | Result | | Spike Level | | Source Result | Percent Recovery | Recovery Limits | RPD | RPD Limit | Flags |
|------------------|-----------|-------------|-------------|----|---------------|------------------|-----------------|-----|-----------|-------|
| DUPLICATE | | | | | | | | | | |
| Laboratory ID: | 08-097-08 | | | | | | | | | |
| | ORIG | DUP | | | | | | | | |
| Copper | ND | ND | NA | NA | | NA | NA | NA | 20 | |
| Zinc | ND | 5.04 | NA | NA | | NA | NA | NA | 20 | |

MATRIX SPIKES

| | | | | | | | | | | |
|----------------|-------------|-------------|------|------|----|------------|------------|--------|---|----|
| Laboratory ID: | 08-097-08 | | | | | | | | | |
| | MS | MSD | MS | MSD | | MS | MSD | | | |
| Copper | 73.2 | 74.4 | 80.0 | 80.0 | ND | 92 | 93 | 75-125 | 2 | 20 |
| Zinc | 86.0 | 87.4 | 80.0 | 80.0 | ND | 108 | 109 | 75-125 | 2 | 20 |





Data Qualifiers and Abbreviations

- A - Due to a high sample concentration, the amount spiked is insufficient for meaningful MS/MSD recovery data.
 - B - The analyte indicated was also found in the blank sample.
 - C - The duplicate RPD is outside control limits due to high result variability when analyte concentrations are within five times the quantitation limit.
 - E - The value reported exceeds the quantitation range and is an estimate.
 - F - Surrogate recovery data is not available due to the high concentration of coeluting target compounds.
 - H - The analyte indicated is a common laboratory solvent and may have been introduced during sample preparation, and be impacting the sample result.
 - I - Compound recovery is outside of the control limits.
 - J - The value reported was below the practical quantitation limit. The value is an estimate.
 - K - Sample duplicate RPD is outside control limits due to sample inhomogeneity. The sample was re-extracted and re-analyzed with similar results.
 - L - The RPD is outside of the control limits.
 - M - Hydrocarbons in the gasoline range are impacting the diesel range result.
 - M1 - Hydrocarbons in the gasoline range (toluene-naphthalene) are present in the sample.
 - N - Hydrocarbons in the lube oil range are impacting the diesel range result.
 - N1 - Hydrocarbons in diesel range are impacting lube oil range results.
 - O - Hydrocarbons indicative of heavier fuels are present in the sample and are impacting the gasoline result.
 - P - The RPD of the detected concentrations between the two columns is greater than 40.
 - Q - Surrogate recovery is outside of the control limits.
 - S - Surrogate recovery data is not available due to the necessary dilution of the sample.
 - T - The sample chromatogram is not similar to a typical _____.
 - U - The analyte was analyzed for, but was not detected above the reported sample quantitation limit.
 - U1 - The practical quantitation limit is elevated due to interferences present in the sample.
 - V - Matrix Spike/Matrix Spike Duplicate recoveries are outside control limits due to matrix effects.
 - W - Matrix Spike/Matrix Spike Duplicate RPD are outside control limits due to matrix effects.
 - X - Sample extract treated with a mercury cleanup procedure.
 - X1 - Sample extract treated with a Sulfuric acid/Silica gel cleanup procedure.
 - Y - The calibration verification for this analyte exceeded the 20% drift specified in method 8260C, and therefore the reported result should be considered an estimate. The overall performance of the calibration verification standard met the acceptance criteria of the method.
 - Z -
- ND - Not Detected at PQL
 PQL - Practical Quantitation Limit
 RPD - Relative Percent Difference





Am Test Inc.
13600 NE 126TH PL
Suite C
Kirkland, WA 98034
(425) 885-1664

**Professional
Analytical
Services**

Aug 23 2018
On-Site Environmental
14648 NE 95th ST
Redmond, WA 98052
Attention: David Baumeister

Dear David Baumeister:

Enclosed please find the analytical data for your REDMOND PAIRED WATERSHED STUDY project.

The following is a cross correlation of client and laboratory identifications for your convenience.

| CLIENT ID | MATRIX | AMTEST ID | TEST |
|-----------------|--------|------------|------------|
| COLM-20180808 | Water | 18-A013747 | Micro, NUT |
| COLUMI-20180808 | Water | 18-A013748 | Micro, NUT |
| COUMO-20180808 | Water | 18-A013749 | Micro, NUT |
| EVAMS-20180808 | Water | 18-A013750 | Micro, NUT |
| EVALSS-20180808 | Water | 18-A013751 | Micro, NUT |
| MONMN-20180808 | Water | 18-A013752 | Micro, NUT |
| MONMS-20180808 | Water | 18-A013753 | Micro, NUT |
| MONM-20180808 | Water | 18-A013754 | Micro, NUT |
| SEIMN-20180808 | Water | 18-A013755 | Micro, NUT |
| SEIMS-20180808 | Water | 18-A013756 | Micro, NUT |
| TOSMI-20180808 | Water | 18-A013757 | Micro, NUT |
| TOSMO-20180808 | Water | 18-A013758 | Micro, NUT |
| TYLMI-20180808 | Water | 18-A013759 | Micro, NUT |
| TYLMO-20180808 | Water | 18-A013760 | Micro, NUT |
| QA52-20180808 | Water | 18-A013761 | Micro, NUT |

Your samples were received on Thursday, August 9, 2018. At the time of receipt, the samples were logged in and properly maintained prior to the subsequent analysis.

The analytical procedures used at AmTest are well documented and are typically derived from the protocols of the EPA, USDA, FDA or the Army Corps of Engineers.

Following the analytical data you will find the Quality Control (QC) results.

Please note that the detection limits that are listed in the body of the report refer to the Practical Quantitation Limits (PQL's), as opposed to the Method Detection Limits (MDL's).

Am Test Inc.
13600 NE 126TH PL
Suite C
Kirkland, WA 98034
(425) 885-1664

**Professional
Analytical
Services**

Aug 23 2018
On-Site Environmental
continued . . .

If you should have any questions pertaining to the data package, please feel free to contact me.

Sincerely,


Aaron W. Young
Laboratory Manager

Project #: 14-05806-000
PO Number: 08-097

BACT = Bacteriological
CONV = Conventional

MET = Metals
ORG = Organics

NUT=Nutrients
DEM=Demand

MIN=Minerals

Am Test Inc.
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Kirkland, WA 98034
(425) 885-1664
www.amtestlab.com



*Professional
Analytical
Services*

ANALYSIS REPORT

On-Site Environmental
14648 NE 95th ST
Redmond, WA 98052
Attention: David Baumeister
Project Name: REDMOND PAIRED WATERSHED STUDY
Project #: 14-05806-000
PO Number: 08-097
All results reported on an as received basis.

Date Received: 08/09/18
Date Reported: 8/23/18

AMTEST Identification Number 18-A013747
Client Identification COLM-20180808
Sampling Date 08/08/18, 10:50

Results

| PARAMETER | RESULT | UNITS | Q | D.L. | METHOD | ANALYST | DATE |
|--------------------------|--------|------------|---|------|-----------|---------|----------|
| Fecal Coliform | 38. | CFU/100 ml | | 1 | SM 9222D | NG | 08/09/18 |
| Total Nitrogen (NOX&TKN) | 1.17 | mg/l | | 0.1 | | | |
| Total Nitrogen (TKN) | 0.891 | mg/l | | 0.1 | SM4500N | JC | 08/13/18 |
| Total Nitrate + Nitrite | 0.28 | mg/l | | 0.01 | SM4500NO3 | JC | 08/15/18 |

AMTEST Identification Number **18-A013748**
Client Identification **COUMI-20180808**
Sampling Date **08/08/18, 16:20**

Results

| PARAMETER | RESULT | UNITS | Q | D.L. | METHOD | ANALYST | DATE |
|--------------------------|--------|------------|---|------|-----------|---------|----------|
| Fecal Coliform | 120 | CFU/100 ml | | 1 | SM 9222D | NG | 08/09/18 |
| Total Nitrogen (NOX&TKN) | 0.78 | mg/l | | 0.1 | | | |
| Total Nitrogen (TKN) | 0.518 | mg/l | | 0.1 | SM4500N | JC | 08/13/18 |
| Total Nitrate + Nitrite | 0.26 | mg/l | | 0.01 | SM4500NO3 | JC | 08/15/18 |

AMTEST Identification Number **18-A013749**
Client Identification **COUMO-20180808**
Sampling Date **08/08/18, 16:00**

Results

| PARAMETER | RESULT | UNITS | Q | D.L. | METHOD | ANALYST | DATE |
|--------------------------|--------|------------|---|------|-----------|---------|----------|
| Fecal Coliform | 150 | CFU/100 ml | | 1 | SM 9222D | NG | 08/09/18 |
| Total Nitrogen (NOX&TKN) | 0.58 | mg/l | | 0.1 | | | |
| Total Nitrogen (TKN) | 0.315 | mg/l | | 0.1 | SM4500N | JC | 08/22/18 |
| Total Nitrate + Nitrite | 0.26 | mg/l | | 0.01 | SM4500NO3 | JC | 08/15/18 |

AMTEST Identification Number **18-A013750**
Client Identification **EVAMS-20180808**
Sampling Date **08/08/18, 14:30**

Results

| PARAMETER | RESULT | UNITS | Q | D.L. | METHOD | ANALYST | DATE |
|--------------------------|--------|------------|---|------|-----------|---------|----------|
| Fecal Coliform | 1200 | CFU/100 ml | | 1 | SM 9222D | NG | 08/09/18 |
| Total Nitrogen (NOX&TKN) | 1.78 | mg/l | | 0.1 | | | |
| Total Nitrogen (TKN) | 0.177 | mg/l | | 0.1 | SM4500N | JC | 08/22/18 |
| Total Nitrate + Nitrite | 1.6 | mg/l | | 0.01 | SM4500NO3 | JC | 08/15/18 |

AMTEST Identification Number **18-A013751**
Client Identification **EVALSS-20180808**
Sampling Date **08/08/18, 14:50**

Results

| PARAMETER | RESULT | UNITS | Q | D.L. | METHOD | ANALYST | DATE |
|--------------------------|--------|------------|---|------|-----------|---------|----------|
| Fecal Coliform | 180 | CFU/100 ml | | 1 | SM 9222D | NG | 08/09/18 |
| Total Nitrogen (NOX&TKN) | 1.20 | mg/l | | 0.1 | | | |
| Total Nitrogen (TKN) | < 0.1 | mg/l | | 0.1 | SM4500N | JC | 08/22/18 |
| Total Nitrate + Nitrite | 1.2 | mg/l | | 0.01 | SM4500NO3 | JC | 08/15/18 |

AMTEST Identification Number **18-A013752**
Client Identification **MONMN-20180808**
Sampling Date **08/08/18, 13:00**

Results

| PARAMETER | RESULT | UNITS | Q | D.L. | METHOD | ANALYST | DATE |
|--------------------------|--------|------------|---|------|-----------|---------|----------|
| Fecal Coliform | 180 | CFU/100 ml | | 1 | SM 9222D | NG | 08/09/18 |
| Total Nitrogen (NOX&TKN) | 0.40 | mg/l | | 0.1 | | | |
| Total Nitrogen (TKN) | 0.207 | mg/l | | 0.1 | SM4500N | JC | 08/22/18 |
| Total Nitrate + Nitrite | 0.19 | mg/l | | 0.01 | SM4500NO3 | JC | 08/15/18 |

AMTEST Identification Number **18-A013753**
Client Identification **MONMS-20180808**
Sampling Date **08/08/18, 13:15**

Results

| PARAMETER | RESULT | UNITS | Q | D.L. | METHOD | ANALYST | DATE |
|--------------------------|--------|------------|---|------|-----------|---------|----------|
| Fecal Coliform | 24. | CFU/100 ml | | 1 | SM 9222D | NG | 08/09/18 |
| Total Nitrogen (NOX&TKN) | 0.37 | mg/l | | 0.1 | | | |
| Total Nitrogen (TKN) | 0.356 | mg/l | | 0.1 | SM4500N | JC | 08/22/18 |
| Total Nitrate + Nitrite | 0.016 | mg/l | | 0.01 | SM4500NO3 | JC | 08/15/18 |

AMTEST Identification Number **18-A013754**
Client Identification **MONM-20180808**
Sampling Date **08/08/18, 12:30**

Results

| PARAMETER | RESULT | UNITS | Q | D.L. | METHOD | ANALYST | DATE |
|--------------------------|--------|------------|---|------|-----------|---------|----------|
| Fecal Coliform | 3100 | CFU/100 ml | | 1 | SM 9222D | NG | 08/09/18 |
| Total Nitrogen (NOX&TKN) | 0.42 | mg/l | | 0.1 | | | |
| Total Nitrogen (TKN) | 0.221 | mg/l | | 0.1 | SM4500N | JC | 08/22/18 |
| Total Nitrate + Nitrite | 0.20 | mg/l | | 0.01 | SM4500NO3 | JC | 08/15/18 |

AMTEST Identification Number **18-A013755**
Client Identification **SEIMN-20180808**
Sampling Date **08/08/18, 10:00**

Results

| PARAMETER | RESULT | UNITS | Q | D.L. | METHOD | ANALYST | DATE |
|--------------------------|--------|------------|---|------|-----------|---------|----------|
| Fecal Coliform | 42. | CFU/100 ml | | 1 | SM 9222D | NG | 08/09/18 |
| Total Nitrogen (NOX&TKN) | 0.24 | mg/l | | 0.1 | | | |
| Total Nitrogen (TKN) | < 0.1 | mg/l | | 0.1 | SM4500N | JC | 08/22/18 |
| Total Nitrate + Nitrite | 0.24 | mg/l | | 0.01 | SM4500NO3 | JC | 08/15/18 |

AMTEST Identification Number 18-A013756
Client Identification SEIMS-20180808
Sampling Date 08/08/18, 12:15

Results

| PARAMETER | RESULT | UNITS | Q | D.L. | METHOD | ANALYST | DATE |
|--------------------------|--------|------------|---|------|-----------|---------|----------|
| Fecal Coliform | 120 | CFU/100 ml | | 1 | SM 9222D | NG | 08/09/18 |
| Total Nitrogen (NOX&TKN) | 0.23 | mg/l | | 0.1 | | | |
| Total Nitrogen (TKN) | < 0.1 | mg/l | | 0.1 | SM4500N | JC | 08/22/18 |
| Total Nitrate + Nitrite | 0.23 | mg/l | | 0.01 | SM4500NO3 | JC | 08/15/18 |

AMTEST Identification Number 18-A013757
Client Identification TOSMI-20180808
Sampling Date 08/08/18, 15:10

Results

| PARAMETER | RESULT | UNITS | Q | D.L. | METHOD | ANALYST | DATE |
|--------------------------|--------|------------|---|------|-----------|---------|----------|
| Fecal Coliform | 160 | CFU/100 ml | | 1 | SM 9222D | NG | 08/09/18 |
| Total Nitrogen (NOX&TKN) | 0.80 | mg/l | | 0.1 | | | |
| Total Nitrogen (TKN) | 0.128 | mg/l | | 0.1 | SM4500N | JC | 08/22/18 |
| Total Nitrate + Nitrite | 0.67 | mg/l | | 0.01 | SM4500NO3 | JC | 08/15/18 |

AMTEST Identification Number 18-A013758
Client Identification TOSMO-20180808
Sampling Date 08/08/18, 15:40

Results

| PARAMETER | RESULT | UNITS | Q | D.L. | METHOD | ANALYST | DATE |
|--------------------------|--------|------------|---|------|-----------|---------|----------|
| Fecal Coliform | 2500 | CFU/100 ml | | 1 | SM 9222D | NG | 08/09/18 |
| Total Nitrogen (NOX&TKN) | 0.63 | mg/l | | 0.1 | | | |
| Total Nitrogen (TKN) | < 0.1 | mg/l | | 0.1 | SM4500N | JC | 08/22/18 |
| Total Nitrate + Nitrite | 0.63 | mg/l | | 0.01 | SM4500NO3 | JC | 08/15/18 |

AMTEST Identification Number 18-A013759
Client Identification TYLMI-20180808
Sampling Date 08/08/18, 14:00

Results

| PARAMETER | RESULT | UNITS | Q | D.L. | METHOD | ANALYST | DATE |
|--------------------------|--------|------------|---|------|-----------|---------|----------|
| Fecal Coliform | 78. | CFU/100 ml | | 1 | SM 9222D | NG | 08/09/18 |
| Total Nitrogen (NOX&TKN) | 1.10 | mg/l | | 0.1 | | | |
| Total Nitrogen (TKN) | < 0.1 | mg/l | | 0.1 | SM4500N | JC | 08/22/18 |
| Total Nitrate + Nitrite | 1.1 | mg/l | | 0.01 | SM4500NO3 | JC | 08/15/18 |

AMTEST Identification Number **18-A013760**
Client Identification **TYLMO-20180808**
Sampling Date **08/08/18, 13:40**


Results

| PARAMETER | RESULT | UNITS | Q | D.L. | METHOD | ANALYST | DATE |
|--------------------------|--------|------------|---|------|-----------|---------|----------|
| Fecal Coliform | 160 | CFU/100 ml | | 1 | SM 9222D | NG | 08/09/18 |
| Total Nitrogen (NOX&TKN) | 0.49 | mg/l | | 0.1 | | | |
| Total Nitrogen (TKN) | 0.167 | mg/l | | 0.1 | SM4500N | JC | 08/22/18 |
| Total Nitrate + Nitrite | 0.32 | mg/l | | 0.01 | SM4500NO3 | JC | 08/15/18 |

AMTEST Identification Number **18-A013761**
Client Identification **QA52-20180808**
Sampling Date **08/08/18, 12:40**

Results

| PARAMETER | RESULT | UNITS | Q | D.L. | METHOD | ANALYST | DATE |
|--------------------------|--------|------------|---|------|-----------|---------|----------|
| Fecal Coliform | 3200 | CFU/100 ml | | 1 | SM 9222D | NG | 08/09/18 |
| Total Nitrogen (NOX&TKN) | 0.54 | mg/l | | 0.1 | | | |
| Total Nitrogen (TKN) | 0.222 | mg/l | | 0.1 | SM4500N | JC | 08/22/18 |
| Total Nitrate + Nitrite | 0.32 | mg/l | | 0.01 | SM4500NO3 | JC | 08/15/18 |


Aaron W. Young
Laboratory Manager

QC Summary for sample numbers: 18-A013747 to 18-A013761

DUPLICATES

| SAMPLE # | ANALYTE | UNITS | SAMPLE VALUE | DUP VALUE | RPD |
|------------|-------------------------|------------|--------------|-----------|------|
| 18-A013747 | Fecal Coliform | CFU/100 ml | 38. | 40. | 5.1 |
| 18-A013761 | Fecal Coliform | CFU/100 ml | 3200 | 3100 | 3.2 |
| 18-A012445 | Total Nitrogen (TKN) | mg/l | < 0.1 | < 0.1 | |
| 18-A013401 | Total Nitrogen (TKN) | mg/l | 25.3 | 24.3 | 4.0 |
| 18-A013726 | Total Nitrogen (TKN) | mg/l | 1.10 | 1.30 | 17. |
| 18-A013748 | Total Nitrogen (TKN) | mg/l | 0.518 | 0.528 | 1.9 |
| 18-A013758 | Total Nitrogen (TKN) | mg/l | < 0.1 | < 0.1 | |
| 18-A013869 | Total Nitrogen (TKN) | mg/l | < 0.1 | < 0.1 | |
| 18-A013974 | Total Nitrogen (TKN) | mg/l | < 0.1 | < 0.1 | |
| 18-A015050 | Total Nitrogen (TKN) | mg/l | < 0.1 | < 0.1 | |
| 18-A013680 | Total Nitrate + Nitrite | mg/l | < 0.01 | 0.000 | |
| 18-A013733 | Total Nitrate + Nitrite | mg/l | 0.44 | 0.46 | 4.4 |
| 18-A013747 | Total Nitrate + Nitrite | mg/l | 0.28 | 0.22 | 24. |
| 18-A013757 | Total Nitrate + Nitrite | mg/l | 0.67 | 0.66 | 1.5 |
| 18-A013773 | Total Nitrate + Nitrite | mg/l | < 0.01 | < 0.01 | |
| 18-A013917 | Total Nitrate + Nitrite | mg/l | 0.54 | 0.52 | 3.8 |
| 18-A014492 | Total Nitrate + Nitrite | mg/l | 0.15 | 0.15 | 0.00 |

MATRIX SPIKES

| SAMPLE # | ANALYTE | UNITS | SAMPLE VALUE | SMPL+ SPK | SPK AMT | RECOVERY |
|------------|-------------------------|-------|--------------|-----------|---------|----------|
| 18-A012445 | Total Nitrogen (TKN) | mg/l | < 0.1 | 0.973 | 1.00 | 97.30 % |
| 18-A013401 | Total Nitrogen (TKN) | mg/l | 25.3 | 30.2 | 5.00 | 98.00 % |
| 18-A013726 | Total Nitrogen (TKN) | mg/l | 1.10 | 2.00 | 1.00 | 90.00 % |
| 18-A013748 | Total Nitrogen (TKN) | mg/l | 0.518 | 1.52 | 1.00 | 100.20 % |
| 18-A013758 | Total Nitrogen (TKN) | mg/l | < 0.1 | 0.518 | 0.500 | 103.60 % |
| 18-A013869 | Total Nitrogen (TKN) | mg/l | < 0.1 | 0.557 | 0.500 | 111.40 % |
| 18-A013974 | Total Nitrogen (TKN) | mg/l | < 0.1 | 0.518 | 0.500 | 103.60 % |
| 18-A015050 | Total Nitrogen (TKN) | mg/l | < 0.1 | 0.977 | 1.00 | 97.70 % |
| 18-A013680 | Total Nitrate + Nitrite | mg/l | < 0.01 | 0.92 | 1.0 | 92.00 % |
| 18-A013733 | Total Nitrate + Nitrite | mg/l | 0.44 | 1.4 | 1.0 | 96.00 % |
| 18-A013747 | Total Nitrate + Nitrite | mg/l | 0.28 | 1.3 | 1.0 | 102.00 % |
| 18-A013757 | Total Nitrate + Nitrite | mg/l | 0.67 | 1.8 | 1.0 | 113.00 % |
| 18-A013773 | Total Nitrate + Nitrite | mg/l | < 0.01 | 1.1 | 1.0 | 110.00 % |
| 18-A013917 | Total Nitrate + Nitrite | mg/l | 0.54 | 1.6 | 1.0 | 106.00 % |
| 18-A014393 | Total Nitrate + Nitrite | mg/l | 9.4 | 19. | 10. | 96.00 % |
| 18-A014492 | Total Nitrate + Nitrite | mg/l | 0.15 | 1.1 | 1.0 | 95.00 % |

QC Summary for sample numbers: 18-A013747 to 18-A013761...

STANDARD REFERENCE MATERIALS

| ANALYTE | UNITS | TRUE VALUE | MEASURED VALUE | RECOVERY |
|-------------------------|-------|------------|----------------|----------|
| Total Nitrogen (TKN) | mg/l | 1.00 | 1.09 | 109. % |
| Total Nitrogen (TKN) | mg/l | 1.00 | 1.08 | 108. % |
| Total Nitrogen (TKN) | mg/l | 1.00 | 1.05 | 105. % |
| Total Nitrogen (TKN) | mg/l | 1.00 | 1.05 | 105. % |
| Total Nitrogen (TKN) | mg/l | 1.00 | 0.988 | 98.8 % |
| Total Nitrogen (TKN) | mg/l | 1.00 | 0.938 | 93.8 % |
| Total Nitrogen (TKN) | mg/l | 1.00 | 0.946 | 94.6 % |
| Total Nitrogen (TKN) | mg/l | 1.00 | 0.959 | 95.9 % |
| Total Nitrate + Nitrite | mg/l | 1.0 | 0.95 | 95.0 % |
| Total Nitrate + Nitrite | mg/l | 1.0 | 0.92 | 92.0 % |
| Total Nitrate + Nitrite | mg/l | 1.0 | 0.90 | 90.0 % |
| Total Nitrate + Nitrite | mg/l | 1.0 | 0.93 | 93.0 % |
| Total Nitrate + Nitrite | mg/l | 1.0 | 1.1 | 110. % |
| Total Nitrate + Nitrite | mg/l | 1.0 | 1.0 | 100. % |
| Total Nitrate + Nitrite | mg/l | 1.0 | 1.0 | 100. % |
| Total Nitrate + Nitrite | mg/l | 1.0 | 0.96 | 96.0 % |

BLANKS

| ANALYTE | UNITS | RESULT |
|-------------------------|------------|--------|
| Fecal Coliform | CFU/100 ml | < 1 |
| Fecal Coliform | CFU/100 ml | < 1 |
| Total Nitrogen (TKN) | mg/l | < 0.1 |
| Total Nitrogen (TKN) | mg/l | < 0.1 |
| Total Nitrogen (TKN) | mg/l | < 0.1 |
| Total Nitrogen (TKN) | mg/l | < 0.1 |
| Total Nitrogen (TKN) | mg/l | < 0.1 |
| Total Nitrogen (TKN) | mg/l | < 0.1 |
| Total Nitrogen (TKN) | mg/l | < 0.1 |
| Total Nitrate + Nitrite | mg/l | < 0.01 |
| Total Nitrate + Nitrite | mg/l | < 0.01 |
| Total Nitrate + Nitrite | mg/l | < 0.01 |
| Total Nitrate + Nitrite | mg/l | 0.028 |
| Total Nitrate + Nitrite | mg/l | < 0.01 |
| Total Nitrate + Nitrite | mg/l | < 0.01 |
| Total Nitrate + Nitrite | mg/l | < 0.01 |
| Total Nitrate + Nitrite | mg/l | < 0.01 |



14648 NE 95th Street, Redmond, WA 98052 · (425) 883-3881

Laboratory: AmTest Laboratories

Attention: Aaron Young

13600 NE 126th PI Kirkland, WA 98034

Phone Number: (425) 885-1664

Turnaround Request

1 Day 2 Day 3 Day

Standard

Other: _____

Laboratory Reference #: 08-097

Project Manager: Blair Goodrow

email: bgoodrow@onsite-env.com

Project Number: 14-05806-000

Project Name: Redmond Paired Watershed Study

| Lab ID | Sample Identification | Date Sampled | Time Sampled | Matrix | # of Cont. | Requested Analyses |
|------------------|-----------------------|--------------|--------------|--------|------------|--|
| 1 | COLM-20180808 13747 | 8/8/18 | 10:50 | Water | 2 | Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N |
| 2 | COUMI-20180808 48 | 8/8/18 | 16:20 | Water | 2 | Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N |
| 3 | COUMO-20180808 49 | 8/8/18 | 16:00 | Water | 2 | Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N |
| 4 | EVAMS-20180808 50 | 8/8/18 | 14:30 | Water | 2 | Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N |
| 5 | EVALSS-20180808 51 | 8/8/18 | 14:50 | Water | 2 | Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N |
| 6 | MONMN-20180808 52 | 8/8/18 | 13:00 | Water | 2 | Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N |
| 7 | MONMS-20180808 53 | 8/8/18 | 13:15 | Water | 2 | Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N |
| 8 | MONM-20180808 54 | 8/8/18 | 12:30 | Water | 2 | Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N |
| 9 | SEIMN-20180808 55 | 8/8/18 | 10:00 | Water | 2 | Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N |
| 10 | SEIMS-20180808 56 | 8/8/18 | 12:15 | Water | 2 | Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N |
| Signature | | Company | | Date | Time | Comments/Special Instructions |
| Relinquished by: | | OnSite Env | | 8/9/18 | 740 | EDDs - CSV Reporting Limits: Fecal Coliform - 1.0 cfu/100ml Total Nitrogen - .10 mg/L 7.3° |
| Received by: | | Am Test | | 8/9/18 | 740 | |
| Relinquished by: | | | | | | |
| Received by: | | | | | | |
| Relinquished by: | | | | | | |
| Received by: | | | | | | |



14648 NE 95th Street, Redmond, WA 98052 · (425) 883-3881

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Turnaround Request

1 Day 2 Day 3 Day

Standard

Other: _____

Laboratory Reference #: 08-097

Project Manager: Blair Goodrow

email: bgoodrow@onsite-env.com

Project Number: 14-05806-000

Project Name: Redmond Paired Watershed Study

| Lab ID | Sample Identification | Date Sampled | Time Sampled | Matrix | # of Cont. | Requested Analyses |
|------------------|-----------------------|--------------|--------------|--|------------|---|
| 11 | TOSMI-20180808 13757 | 8/8/18 | 15:10 | Water | 2 | Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N |
| 12 | TOSMC-20180808 58 | 8/8/18 | 15:40 | Water | 2 | Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N |
| 13 | TYLMI-20180808 59 | 8/8/18 | 14:00 | Water | 2 | Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N |
| 14 | TYLMO-20180808 60 | 8/8/18 | 13:40 | Water | 2 | Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N |
| 15 | QA52-20180808 61 | 8/8/18 | 12:40 | Water | 2 | Fecal Coliform SM 9222D, Total Nitrogen SM 4500-N |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| Signature | Company | Date | Time | Comments/Special Instructions | | |
| Relinquished by: | OnSite Env | 8/9/18 | 740 | EDDs - CSV Reporting Limits: Fecal Coliform - 1.0 cfu/100ml Total Nitrogen - .10 mg/L 7.36 | | |
| Received by: | Am Test | 8/9/18 | 240 | | | |
| Relinquished by: | | | | | | |
| Received by: | | | | | | |
| Relinquished by: | | | | | | |
| Received by: | | | | | | |



CHAIN OF CUSTODY

14648 NE 95th Street, Redmond, WA 98052
Telephone: 425.883.3881

Company: Herrera Environmental Consultants
Project No.: 14-05806-000
Project Name: Redmond Paired Watershed Study
Project Manager: George Iftner

Turnaround Requested:

 1 Day
 2 Day
 3 Day
 Standard

Laboratory No.

08-097

Requested Analyses

| Total Suspended Solids (SM 2540D) | Turbidity (EPA 181.1) | Hardness (EPA 200.7 / SM 2340B) | Dissolved Organ Carbon (SM 5310B) * | Fecal Coliform (SM 9222D) | Total Phosphorus (EPA 365.1) | Total Nitrogen (SM 4500 N-B) | Total Cu and Zn (EPA 200.8) | Dissolved Cu and Zn (EPA 200.8) * | | | | | | | |
|-----------------------------------|-----------------------|---------------------------------|-------------------------------------|---------------------------|------------------------------|------------------------------|-----------------------------|-----------------------------------|--|--|--|--|--|--|--|
|-----------------------------------|-----------------------|---------------------------------|-------------------------------------|---------------------------|------------------------------|------------------------------|-----------------------------|-----------------------------------|--|--|--|--|--|--|--|

| Lab ID | Sample Identification | Date Sampled | Time Sampled | Matrix | # of Cont. | Total Suspended Solids (SM 2540D) | Turbidity (EPA 181.1) | Hardness (EPA 200.7 / SM 2340B) | Dissolved Organ Carbon (SM 5310B) * | Fecal Coliform (SM 9222D) | Total Phosphorus (EPA 365.1) | Total Nitrogen (SM 4500 N-B) | Total Cu and Zn (EPA 200.8) | Dissolved Cu and Zn (EPA 200.8) * | | | | | | | |
|--------|-----------------------|--------------|--------------|--------|------------|-----------------------------------|-----------------------|---------------------------------|-------------------------------------|---------------------------|------------------------------|------------------------------|-----------------------------|-----------------------------------|---|--|--|--|--|--|--|
| 1 | COLM-2018 0808 | 8.6.18 | 10:50 | Water | 7 | X | X | X | X | X | X | X | X | X | | | | | | | |
| 2 | COUMI-2018 0808 | 8.8.18 | 16:20 | Water | 7 | X | X | X | X | X | X | X | X | X | | | | | | | |
| 3 | COUMO-2018 0808 | 8.8.18 | 16:00 | Water | 7 | X | X | X | X | X | X | X | X | X | | | | | | | |
| 4 | EVAMS-2018 0808 | 8.8.18 | 14:30 | Water | 7 | X | X | X | X | X | X | X | X | X | | | | | | | |
| 5 | EVALSS-2018 0808 | ↓ | 14:30 | Water | 7 | X | X | X | X | X | X | X | X | X | | | | | | | |
| 6 | MONMN-2018 0808 | | 18:00 | Water | 7 | X | X | X | X | X | X | X | X | X | X | | | | | | |
| 7 | MONMS-2018 0808 | | 13:15 | Water | 7 | X | X | X | X | X | X | X | X | X | X | | | | | | |
| 8 | MONM-2018 0808 | | 12:30 | Water | 7 | X | X | X | X | X | X | X | X | X | X | | | | | | |
| 9 | SEIMN-2018 0808 | | 10:00 | Water | 7 | X | X | X | X | X | X | X | X | X | X | | | | | | |
| 10 | SEIMS-2018 0808 | | 12:15 | Water | 7 | X | X | X | X | X | X | X | X | X | X | | | | | | |
| 11 | TOSMI-2018 0808 | | 18:10 | Water | 7 | X | X | X | X | X | X | X | X | X | X | | | | | | |
| 12 | TOSMO-2018 0808 | | 15:40 | Water | 7 | X | X | X | X | X | X | X | X | X | X | | | | | | |
| 13 | TYLMI-2018 0808 | | 14:00 | Water | 7 | X | X | X | X | X | X | X | X | X | X | | | | | | |
| 14 | TYLMO-2018 0808 | | 13:40 | Water | 7 | X | X | X | X | X | X | X | X | X | X | | | | | | |
| 15 | QA52-20180808 | | 12:46 | Water | 7 | X | X | X | X | X | X | X | X | X | X | | | | | | |

Relinquished by Meghan Muller Date 8.8.18 Received by [Signature] Date 8/8/18
 Firm Herrera Time 16:25 Firm [Signature] Time 16:25
 Relinquished by _____ Date _____ Received by _____ Date _____
 Firm _____ Time _____ Firm _____ Time _____

Comments:
 * - field filtered with 0.45 µm filter within 15 minutes of collecting sample



14648 NE 95th Street, Redmond, WA 98052
Telephone: 425.883.3881

Company: Herrera Environmental Consultants
Project No.: 14-05806-000
Project Name: Redmond Paired Watershed Study
Project Manager: George Ittner

CHAIN OF CUSTODY

Turnaround Requested:

_____ 1 Day

_____ 2 Day

_____ 3 Day

Standard

Laboratory No. 08-097

Requested Analyses

| Lab ID | Sample Identification | Date Sampled | Time Sampled | Matrix | # of Cont. | Total Suspended Solids (SM 2540D) | Turbidity (EPA 181.1) | Hardness (EPA 200.7 / SM 2340B) | Dissolved Organ Carbon (SM 5310B) * | Fecal Coliform (SM 9222D) | Total Phosphorus (EPA 365.1) | Total Nitrogen (SM 4500 N-B) | Total Cu and Zn (EPA 200.8) | Dissolved Cu and Zn (EPA 200.8) * |
|--------|-----------------------|--------------|--------------|--------|------------|-----------------------------------|-----------------------|---------------------------------|-------------------------------------|---------------------------|------------------------------|------------------------------|-----------------------------|-----------------------------------|
| 1 | COLM-2018 0808 | 8.8.18 | 10:50 | Water | 7 | X | X | X | X | X | X | X | X | X |
| 2 | COUMI-2018 0808 | 8.8.18 | 16:20 | Water | 7 | X | X | X | X | X | X | X | X | X |
| 3 | COUMO-2018 0808 | 8.8.18 | 16:00 | Water | 7 | X | X | X | X | X | X | X | X | X |
| 4 | EVAMS-2018 0808 | 8.8.18 | 14:30 | Water | 7 | X | X | X | X | X | X | X | X | X |
| 5 | EVALSS-2018 0808 | | 14:28 | Water | 7 | X | X | X | X | X | X | X | X | X |
| 6 | MONMN-2018 0808 | | 12:00 | Water | 7 | X | X | X | X | X | X | X | X | X |
| 7 | MONMS-2018 0808 | | 12:15 | Water | 7 | X | X | X | X | X | X | X | X | X |
| 8 | MONM-2018 0808 | | 12:30 | Water | 7 | X | X | X | X | X | X | X | X | X |
| 9 | SEIMN-2018 0808 | | 10:00 | Water | 7 | X | X | X | X | X | X | X | X | X |
| 10 | SEIMS-2018 0808 | | 12:15 | Water | 7 | X | X | X | X | X | X | X | X | X |
| 11 | TOSMI-2018 0808 | | 15:10 | Water | 7 | X | X | X | X | X | X | X | X | X |
| 12 | TOSMO-2018 0808 | | 15:40 | Water | 7 | X | X | X | X | X | X | X | X | X |
| 13 | TYLMI-2018 0808 | | 14:00 | Water | 7 | X | X | X | X | X | X | X | X | X |
| 14 | TYLMO-2018 0808 | | 13:40 | Water | 7 | X | X | X | X | X | X | X | X | X |
| 15 | QAS2-20180808 | | 12:40 | Water | 7 | X | X | X | X | X | X | X | X | X |

Relinquished by Meghan Muller Date 8.8.18 Received by [Signature] Date 8/8/18

Firm Herrera Time 4:16:25 Firm OSE Time 16:25

Relinquished by _____ Date _____ Received by _____ Date _____

Firm _____ Time _____ Firm _____ Time _____

Comments:
* - field filtered with 0.45 µm filter within 15 minutes of collecting sample

METER CALIBRATION LOG - Redmond Paired Watershed Study

| | | | |
|-----------------------------------|----------------|------------|--|
| Project Number: | 14-05806-000 | | |
| Personnel Performing Calibration: | ALEX SVENDSEN | | |
| Meter: | YSI Pro DSS #1 | | |
| Date/Time: | 8/8/18 | | |
| Barometric Pressure Start of Day: | mmHg: 756.6 | Time: 0830 | |
| Barometric Pressure End of Day: | mmHg: 754.6 | Time: 1748 | |

| |
|---|
| Calibration Procedures: |
| Rinse Multimeter Sonde Between Each Operation |
| Rinse 3 times with tap water, 3 times with deionized water, then 3 times with the solution to be used for calibrating or testing. |
| Conductivity Calibration Notes: |



| PRE Field Run CALIBRATION | Meter Reading | Buffer / Cal Std | Temp °C | Comments |
|---------------------------|---------------|------------------|---------|-----------------------------------|
| Conductivity (µS/cm) | 1.7 | 0 | 25.2 | |
| Conductivity (µS/cm) | 1,003 | 1,000 | 24.2 | CALIB'D, READS 1,000 µS AFTER CAL |
| Conductivity (µS/cm) | 100.5 | 100 | 24.4 | |
| DO % Saturation | 99.9 | 100 | 23.5 | |
| | | | | |
| POST Field Run CHECK | Meter Reading | Buffer / Cal Std | Temp °C | Comments |
| Conductivity (µS/cm) | 1.6 | 0 | 25.1 | |
| Conductivity (µS/cm) | 100.1 | 100 | 24.4 | |
| DO % Saturation | 100.1 | 100 | 23.8 | |

1. Dry the conductivity probe with a lab tissue (e.g., KimWipes®) and DI water.
 2. Fill calibration cup to within a centimeter of the top of the calibration cup with DI water (0 µS).
 3. Fill the calibration cup with 1,000 µS standard so that the temperature/conductivity probe is submerged.
 4. Make sure there are no bubbles in the cell; wait 2 minutes.
 5. Enter the appropriate standard value (1,000 µS/cm or 1.0 mS/cm) for Sp Cond.
 6. Check conductivity using 100 µS/cm standard.
- Dissolved Oxygen Calibration Notes:**
1. Fill the calibration cup with about 1/2 inch of DI; it should be below the sensor cap.
 2. Use KimWipes® to dry any droplets from the sensor cap.
 3. Invert calibration cup's cap and gently rest it on the cup.
 4. Wait 5 minutes, making sure that temperature stabilizes.
 5. Determine local barometric pressure (mm Hg) and enter this value into the meter.
 6. Click "Calibrate". "Calibrate Successful" will be displayed.
 7. To retain calibration accuracy between measurements, store with the sensor immersed in water or within a water-saturated air environment such as a sealed storage cup with at least 10 ml of water.
 8. It is important to have the water-saturated air and the sensor at the same temperature. Therefore, store a jar of DI in the same environment as the sonde and calibrate in a similar air temperature as the water and sonde.
 9. Keep probe out of direct sun or wind.

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: A.S + M.M
 Sample Date: 8.8.18 Sample Time: 10:50 PDT
 Base Flow or Storm Event? Field Filtered Time: 10:55 PST
 (Must filter within 15 minutes of collection)

SITE ID: COLM
 Project Number: 14-05806-000



Project Name: Redmond Paired Watershed Study
 Current Weather and Temp: 75° Sunny

Water Quality Sampling

Sample ID: COLM-2018 0808

| Parameter | Bottle Type | Bottle Volume | # Bottles | Preservative | Duplicated? |
|---------------------------|-------------|---------------|-----------|--------------------------------|-------------|
| TSS and Turbidity | HDPE | 1L | 1 | NA | <u>NA</u> |
| DOC * | HDPE | 250 ml | 1 | HCL | |
| Fecal Col. Bact. | HDPE | 250 ml | 1 | EDTA | |
| T. Phosphorous | HDPE | 250 ml | 1 | H ₂ SO ₄ | |
| T Nitrogen | HDPE | 250 ml | 1 | H ₂ SO ₄ | |
| Diss. Cu and Zn * | HDPE | 250 ml | 1 | HNO ₃ | |
| Hardness, Total Cu and Zn | HDPE | 500 ml | 1 | HNO ₃ | |

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID: NA
 Filter blank sample ID: NA
 Transfer blank sample ID: NA

Visual and Olfactory Conditions:

Clarity: clear
 Color: none
 Odor: none
 Sheen: none
 Floatables: some turbidity

LABORATORY DELIVERY

Date: _____ Time: _____

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

YSI Pro Plus (15D100020) _____
 YSI Pro DSS 1 X _____
 YSI Pro DSS 2 _____

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): - dry
 Reference Point (description): 5G

Water Quality Measurements

Temperature (°C) 16.0
 Specific Conductivity (µs/cm) 69.4
 Dissolved Oxygen (mg/L) 7.67

Quality Assurance

Checked By: Sarah Leath Signature: [Signature]
 Date Checked: 10-16-18 Time: _____
 Data Entered into Database? YES NO initials:
 Date Entered: _____ Time: _____
 Notes: _____

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: AST MM

Sample Date: 8.8.18

Sample Time: 16:20

PDT:

SITE ID: COUMI

Base Flow or Storm Event?

Field Filtered Time: 16:25
(Must filter within 15 minutes of collection)

PST:

Project Number: 14-05806-000



HERRERA

Project Name: Redmond Paired Watershed Study

Current Weather and Temp: Sunny 85°

Water Quality Sampling

Sample ID: COUMI-20180808

| Parameter | Bottle Type | Bottle Volume | # Bottles | Preservative | Duplicated? |
|---------------------------|-------------|---------------|-----------|--------------------------------|-------------|
| TSS and Turbidity | HDPE | 1L | 1 | NA | <u>NO</u> |
| DOC * | HDPE | 250 ml | 1 | HCL | ↓ |
| Fecal Col. Bact. | HDPE | 250 ml | 1 | EDTA | |
| T. Phosphorous | HDPE | 250 ml | 1 | H ₂ SO ₄ | |
| T. Nitrogen | HDPE | 250 ml | 1 | H ₂ SO ₄ | |
| Diss. Cu and Zn * | HDPE | 250 ml | 1 | HNO ₃ | |
| Hardness, Total Cu and Zn | HDPE | 500 ml | 1 | HNO ₃ | |

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID: /

Filter blank sample ID: /

Transfer blank sample ID: /

Visual and Olfactory Conditions:

Clarity: clear
 Color: none
 Odor: none
 Sheen: none
 Floatables: none

LABORATORY DELIVERY

Date: _____ Time: _____

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

YSI Pro Plus (15D100020)

YSI Pro DSS 1

YSI Pro DSS 2

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): 2.67

Reference Point (description): SG

Water Quality Measurements

Temperature (°C) 17.1

Specific Conductivity (µs/cm) 347.1

Dissolved Oxygen (mg/L) 9.38

Quality Assurance

Checked By: John Lynch Signature: [Signature]

Date Checked: 10-16-18 Time: /

Data Entered into Database? YES NO initials: _____

Date Entered: _____ Time: _____

Notes: _____

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: AS + MM

Sample Date: 8.2.18

Sample Time: 10:00

PDT:

SITE ID: COUMO

Base Flow or Storm Event?

Field Filtered Time: 16:05
(Must filter within 15 minutes of collection)

PST:

Project Number: 14-05806-000



HERRERA

Project Name: Redmond Paired Watershed Study

Current Weather and Temp: 85° Sunny

Water Quality Sampling

Sample ID: COUMO-20180808

| Parameter | Bottle Type | Bottle Volume | # Bottles | Preservative | Duplicated? |
|---------------------------|-------------|---------------|-----------|--------------------------------|-------------|
| TSS and Turbidity | HDPE | 1L | 1 | NA | <u>NO</u> |
| DOC * | HDPE | 250 ml | 1 | HCL | ↓ |
| Fecal Col. Bact. | HDPE | 250 ml | 1 | EDTA | |
| T. Phosphorous | HDPE | 250 ml | 1 | H ₂ SO ₄ | |
| T. Nitrogen | HDPE | 250 ml | 1 | H ₂ SO ₄ | |
| Diss. Cu and Zn * | HDPE | 250 ml | 1 | HNO ₃ | |
| Hardness, Total Cu and Zn | HDPE | 500 ml | 1 | HNO ₃ | |

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID: /

Filter blank sample ID: /

Transfer blank sample ID: /

Visual and Olfactory Conditions:

Clarity: clear
 Color: none
 Odor: none
 Sheen: none
 Floatables: none

LABORATORY DELIVERY

Date: _____ Time: _____

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

YSI Pro Plus (15D100020) _____

YSI Pro DSS 1 X

YSI Pro DSS 2 _____

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): 1.20

Reference Point (description): SG

Water Quality Measurements

Temperature (°C) 18.2

Specific Conductivity (µs/cm) 257.2

Dissolved Oxygen (mg/L) 9.02

Quality Assurance

Checked By: Brian Lamb

Signature: [Signature]

Date Checked: 10-16-18

Time: _____

Data Entered into Database? YES NO initials: _____

Date Entered: _____ Time: _____

Notes: _____

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: AS + MM

Sample Date: 8.8.18

Sample Time: 14:30

PDT:

SITE ID: EVAMS

Base Flow or Storm Event?

Field Filtered Time: 14:35
(Must filter within 15 minutes of collection)

PST:

Project Number: 14-05806-000



HERRERA

Project Name: Redmond Paired Watershed Study

Current Weather and Temp: 85° sunny

Water Quality Sampling

Sample ID: EVAMS-20180806

| Parameter | Bottle Type | Bottle Volume | # Bottles | Preservative | Duplicated? |
|---------------------------|-------------|---------------|-----------|--------------------------------|-------------|
| TSS and Turbidity | HDPE | 1L | 1 | NA | <u>No</u> |
| DOC * | HDPE | 250 ml | 1 | HCL | ↓ |
| Fecal Col. Bact. | HDPE | 250 ml | 1 | EDTA | |
| T. Phosphorous | HDPE | 250 ml | 1 | H ₂ SO ₄ | |
| T. Nitrogen | HDPE | 250 ml | 1 | H ₂ SO ₄ | |
| Diss. Cu and Zn * | HDPE | 250 ml | 1 | HNO ₃ | |
| Hardness, Total Cu and Zn | HDPE | 500 ml | 1 | HNO ₃ | |

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID: _____

Filter blank sample ID: _____

Transfer blank sample ID: _____

Visual and Olfactory Conditions:

Clarity: clear
 Color: none
 Odor: none
 Sheen: none
 Floatables: none

LABORATORY DELIVERY

Date: _____ Time: _____

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

YSI Pro Plus (15D100020) _____

YSI Pro DSS 1 _____

YSI Pro DSS 2 _____

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): 3.89

Reference Point (description): SG

Water Quality Measurements

Temperature (°C) 15.7

Specific Conductivity (µs/cm) 232.6

Dissolved Oxygen (mg/L) 9.63

Quality Assurance

Checked By: John Heath Signature: [Signature]

Date Checked: 10-16-18 Time: _____

Data Entered into Database? YES NO initials: _____

Date Entered: _____ Time: _____

Notes: _____

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: AS + MM

Sample Date: 8.8.18

Sample Time: 14:50

PDT

Base Flow or Storm Event?

Field Filtered Time: 14:55

PST

(Must filter within 15 minutes of collection)

SITE

ID: EVALS5

Project Number: 14-05806-000

Project Name: Redmond Paired Watershed Study



HERRERA

Current Weather and Temp: 85° Sunny

Water Quality Sampling

Sample ID: EVALS5-20180808

| Parameter | Bottle Type | Bottle Volume | # Bottles | Preservative | Duplicated? |
|---------------------------|-------------|---------------|-----------|--------------------------------|-------------|
| TSS and Turbidity | HDPE | 1L | 1 | NA | <u>no</u> |
| DOC * | HDPE | 250 ml | 1 | HCL | |
| Fecal Col. Bact. | HDPE | 250 ml | 1 | EDTA | |
| T. Phosphorous | HDPE | 250 ml | 1 | H ₂ SO ₄ | |
| T Nitrogen | HDPE | 250 ml | 1 | H ₂ SO ₄ | |
| Diss. Cu and Zn * | HDPE | 250 ml | 1 | HNO ₃ | |
| Hardness, Total Cu and Zn | HDPE | 500 ml | 1 | HNO ₃ | |

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID: _____

Filter blank sample ID: _____

Transfer blank sample ID: _____

Visual and Olfactory Conditions:

Clarity: clear
 Color: none
 Odor: none
 Sheen: none
 Floatables: none

LABORATORY DELIVERY

Date: _____ Time: _____

Quality Assurance

Checked By: John Lenth Signature: _____

Date Checked: 10-16-18 Time: _____

Data Entered into Database? YES NO initials: _____

Date Entered: _____ Time: _____

Notes: _____

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

YSI Pro Plus (15D100020) _____

YSI Pro DSS 1

YSI Pro DSS 2 _____

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): 2.27

Reference Point (description): SG

Water Quality Measurements

Temperature (°C) 16.0

Specific Conductivity (µs/cm) 212.8

Dissolved Oxygen (mg/L) 9.70

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: AS + MM
 Sample Date: 8.8.18 Sample Time: 12:00 PDT
 Base Flow or Storm Event? Field Filtered Time: 13:05 PST:
 (Must filter within 15 minutes of collection)

SITE ID: MONMN

Project Number: 14-05806-000



Project Name: Redmond Paired Watershed Study

Current Weather and Temp: 88° Sunny

Water Quality Sampling

Sample ID: MONMN-20180806

| Parameter | Bottle Type | Bottle Volume | # Bottles | Preservative | Duplicated? |
|---------------------------|-------------|---------------|-----------|--------------------------------|-------------|
| TSS and Turbidity | HDPE | 1L | 1 | NA | <u>No</u> |
| DOC * | HDPE | 250 ml | 1 | HCL | ↓ |
| Fecal Col. Bact. | HDPE | 250 ml | 1 | EDTA | |
| T. Phosphorous | HDPE | 250 ml | 1 | H ₂ SO ₄ | |
| T. Nitrogen | HDPE | 250 ml | 1 | H ₂ SO ₄ | |
| Diss. Cu and Zn * | HDPE | 250 ml | 1 | HNO ₃ | |
| Hardness, Total Cu and Zn | HDPE | 500 ml | 1 | HNO ₃ | |

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID: _____
 Filter blank sample ID: _____
 Transfer blank sample ID: _____

Visual and Olfactory Conditions:

Clarity: clear
 Color: none
 Odor: none
 Sheen: none
 Floatables: none

LABORATORY DELIVERY

Date: _____ Time: _____

Quality Assurance

Checked By: Solun Lenth Signature: [Signature]
 Date Checked: 10-16-18 Time: _____
 Data Entered into Database? YES NO initials:
 Date Entered: _____ Time: _____
 Notes: _____

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

YSI Pro Plus (15D100020) _____
 YSI Pro DSS 1 X
 YSI Pro DSS 2 _____

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): 9.21
 Reference Point (description): SG

Water Quality Measurements

Temperature (°C) 16.9
 Specific Conductivity (µs/cm) 241.8
 Dissolved Oxygen (mg/L) 8.86

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: AS & MM

Sample Date: 8.8.18

Sample Time: 13:15

PDT:

SITE

ID: MONMS

Base Flow or Storm Event?

Field Filtered Time: 13:20
(Must filter within 15 minutes of collection)

PST:

Project Number: 14-05806-000



HERRERA

Project Name: Redmond Paired Watershed Study

Current Weather and Temp: 85° sunny

Water Quality Sampling

Sample ID: MONMS - 2018 0808

| Parameter | Bottle Type | Bottle Volume | # Bottles | Preservative | Duplicated? |
|---------------------------|-------------|---------------|-----------|--------------------------------|-------------|
| TSS and Turbidity | HDPE | 1L | 1 | NA | <u>NC</u> |
| DOC * | HDPE | 250 ml | 1 | HCL | ↓ |
| Fecal Col. Bact. | HDPE | 250 ml | 1 | EDTA | |
| T. Phosphorous | HDPE | 250 ml | 1 | H ₂ SO ₄ | |
| T Nitrogen | HDPE | 250 ml | 1 | H ₂ SO ₄ | |
| Diss. Cu and Zn * | HDPE | 250 ml | 1 | HNO ₃ | |
| Hardness, Total Cu and Zn | HDPE | 500 ml | 1 | HNO ₃ | |

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID:

Filter blank sample ID:

Transfer blank sample ID:

Visual and Olfactory Conditions:

Clarity: clear
 Color: none
 Odor: none
 Sheen: none
 Floatables: none

LABORATORY DELIVERY

Date: _____ Time: _____

Quality Assurance

Checked By: Sarah Gentry Signature: [Signature]

Date Checked: 10-16-18 Time: _____

Data Entered into Database? YES NO initials: _____

Date Entered: _____ Time: _____

Notes: _____

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

YSI Pro Plus (15D100020) _____

YSI Pro DSS 1

YSI Pro DSS 2 _____

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): 6.87

Reference Point (description): top of PVC pipe

Water Quality Measurements

Temperature (°C) 17.9

Specific Conductivity (µs/cm) 411.5

Dissolved Oxygen (mg/L) 6.31

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: AS + MM

Sample Date: 8.8.18

Sample Time: 12:30 / 12:40 QA

SITE ID: MONM

Base Flow or Storm Event? (S)

Field Filtered Time: 12:35 / 12:45
(Must filter within 15 minutes of collection)

Project Number: 14-05806-000



HERRERA

Project Name: Redmond Paired Watershed Study

Current Weather and Temp: 80° Sunny

Water Quality Sampling

Sample ID: MONM-20180808

| Parameter | Bottle Type | Bottle Volume | # Bottles | Preservative | Duplicated? |
|---------------------------|-------------|---------------|-----------|--------------------------------|-------------|
| TSS and Turbidity | HDPE | 1L | 1 | NA | <u>yes</u> |
| DOC * | HDPE | 250 ml | 1 | HCL | ↓ |
| Fecal Col. Bact. | HDPE | 250 ml | 1 | EDTA | |
| T. Phosphorous | HDPE | 250 ml | 1 | H ₂ SO ₄ | |
| T. Nitrogen | HDPE | 250 ml | 1 | H ₂ SO ₄ | |
| Diss. Cu and Zn * | HDPE | 250 ml | 1 | HNO ₃ | |
| Hardness, Total Cu and Zn | HDPE | 500 ml | 1 | HNO ₃ | |

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID: GA52-20180808

Filter blank sample ID: ~~GA52-20180808~~

Transfer blank sample ID: _____

Visual and Olfactory Conditions:

Clarity: turbid
 Color: none
 Odor: decaying odor
 Sheen: none
 Floatables: none

LABORATORY DELIVERY

Date: _____ Time: _____

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

YSI Pro Plus (15D100020) _____

YSI Pro DSS 1 X

YSI Pro DSS 2 _____

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): _____

Reference Point (description): —

Water Quality Measurements

Temperature (°C) 15.3

Specific Conductivity (µs/cm) 254.4

Dissolved Oxygen (mg/L) 9.60

Quality Assurance

Checked By: Solara Leath Signature: _____

Date Checked: 10-16-18 Time: _____

Data Entered into Database? YES NO initials: _____

Date Entered: _____ Time: _____

Notes: _____

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: ALEX S. MEGHAN M
 Sample Date: 9.09.19 Sample Time: 10:00
 Base Flow or Storm Event? (B) Field Filtered Time: 10:05
 (Must filter within 15 minutes of collection)

SITE ID: SEIMN
 Project Number: 14-05806-000



Project Name: Redmond Paired Watershed Study

Current Weather and Temp: 75° Sunny

Water Quality Sampling

Sample ID: SEIMN-2019-0808

| Parameter | Bottle Type | Bottle Volume | # Bottles | Preservative | Duplicated? |
|---------------------------|-------------|---------------|-----------|--------------------------------|-------------|
| TSS and Turbidity | HDPE | 1L | 1 | NA | <u>No</u> |
| DOC * | HDPE | 250 ml | 1 | HCL | ↓ |
| Fecal Col. Bact. | HDPE | 250 ml | 1 | EDTA | |
| T. Phosphorous | HDPE | 250 ml | 1 | H ₂ SO ₄ | |
| T. Nitrogen | HDPE | 250 ml | 1 | H ₂ SO ₄ | |
| Diss. Cu and Zn * | HDPE | 250 ml | 1 | HNO ₃ | |
| Hardness, Total Cu and Zn | HDPE | 500 ml | 1 | HNO ₃ | |

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID: ---
 Filter blank sample ID: ---
 Transfer blank sample ID: ---

Visual and Olfactory Conditions:

Clarity: clear
 Color: clear
 Odor: none
 Sheen: none
 Floatables: none

LABORATORY DELIVERY

Date: _____ Time: _____

Quality Assurance

Checked By: John Lentz Signature: _____
 Date Checked: 10-16-19 Time: _____
 Data Entered into Database? YES NO initials: _____
 Date Entered: _____ Time: _____
 Notes: _____

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

YSI Pro Plus (15D100020) _____
 YSI Pro DSS 1 X _____
 YSI Pro DSS 2 _____

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): top / bottom of bolt
 Reference Point (description): .73 or 69

Water Quality Measurements

Temperature (°C) 13.4
 Specific Conductivity (µs/cm) 119.6
 Dissolved Oxygen (mg/L) 10.2

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel:

AS MM

Sample Date:

9-8-18

Sample Time:

12:15

 PDT:

SITE

ID:

SEIMS

Base Flow or Storm Event?

Field Filtered Time:

12:26

PST:

Project Number: 14-05806-000


HERRERA

Project Name: Redmond Paired Watershed Study

Current Weather and Temp:

80° Sunny

Water Quality Sampling

Sample ID:

SEIMS-2018 0808

| Parameter | Bottle Type | Bottle Volume | # Bottles | Preservative | Duplicated? |
|---------------------------|-------------|---------------|-----------|--------------------------------|-------------|
| TSS and Turbidity | HDPE | 1L | 1 | NA | NO |
| DOC * | HDPE | 250 ml | 1 | HCL | |
| Fecal Col. Bact. | HDPE | 250 ml | 1 | EDTA | |
| T. Phosphorous | HDPE | 250 ml | 1 | H ₂ SO ₄ | |
| T. Nitrogen | HDPE | 250 ml | 1 | H ₂ SO ₄ | |
| Diss. Cu and Zn * | HDPE | 250 ml | 1 | HNO ₃ | |
| Hardness, Total Cu and Zn | HDPE | 500 ml | 1 | HNO ₃ | |

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID:

Filter blank sample ID:

Transfer blank sample ID:

Visual and Olfactory Conditions:

Clarity:

clear

Color:

none

Odor:

none

Sheen:

none

Floatables:

none

LABORATORY DELIVERY

Date:

Time:

Quality Assurance

Checked By:

John Lantz

Signature:

Date Checked:

10-16-18

Time:

Data Entered into Database?

YES

NO

initials:

Date Entered:

Time:

Notes:

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

YSI Pro Plus (15D100020)

 YSI Pro DSS 1

YSI Pro DSS 2

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft):

0.76

Reference Point (description):

SG

Water Quality Measurements

Temperature (°C)

14.6

Specific Conductivity (µs/cm)

128.6

Dissolved Oxygen (mg/L)

9.76

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: AS + MM

Sample Date: 8.6.18

Sample Time: 15:10

PDT:

SITE

ID:

TOSMI

Base Flow or Storm Event?

Field Filtered Time: 15:15

PST:

Project Number: 14-05806-000

(Must filter within 15 minutes of collection)



HERRERA

Project Name: Redmond Paired Watershed Study

Current Weather and Temp: 85° Sunny

Water Quality Sampling

Sample ID: TOSMI-20180808

| Parameter | Bottle Type | Bottle Volume | # Bottles | Preservative | Duplicated? |
|---------------------------|-------------|---------------|-----------|--------------------------------|-------------|
| TSS and Turbidity | HDPE | 1L | 1 | NA | <u>NO</u> |
| DOC * | HDPE | 250 ml | 1 | HCL | ↓ |
| Fecal Col. Bact. | HDPE | 250 ml | 1 | EDTA | |
| T. Phosphorous | HDPE | 250 ml | 1 | H ₂ SO ₄ | |
| T. Nitrogen | HDPE | 250 ml | 1 | H ₂ SO ₄ | |
| Diss. Cu and Zn * | HDPE | 250 ml | 1 | HNO ₃ | |
| Hardness, Total Cu and Zn | HDPE | 500 ml | 1 | HNO ₃ | |

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID:

Filter blank sample ID:

Transfer blank sample ID:

Visual and Olfactory Conditions:

Clarity:

clear

Color:

none

Odor:

none

Sheen:

none

Floatables:

none

LABORATORY DELIVERY

Date:

Time:

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

YSI Pro Plus (15D100020)

YSI Pro DSS 1

YSI Pro DSS 2

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft):

0.69

Reference Point (description):

SG

Water Quality Measurements

Temperature (°C)

17.3

Specific Conductivity (µs/cm)

313.2

Dissolved Oxygen (mg/L)

9.30

Quality Assurance

Checked By:

S. Van Lenth

Signature:

Date Checked:

10-16-18

Time:

Data Entered into Database?

YES

NO

initials:

Date Entered:

Time:

Notes:

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: AS + MM

Sample Date: 8.8.18

Sample Time: 15:40

SITE ID: TOSMO

Base Flow or Storm Event? Base Flow

Field Filtered Time: 15:45
(Must filter within 15 minutes of collection)

PDT:
PST:

Project Number: 14-05806-000



Project Name: Redmond Paired Watershed Study

Current Weather and Temp:

Water Quality Sampling

Sample ID: TOSMO-2018 0808

| Parameter | Bottle Type | Bottle Volume | # Bottles | Preservative | Duplicated? |
|---------------------------|-------------|---------------|-----------|--------------------------------|-------------|
| TSS and Turbidity | HDPE | 1L | 1 | NA | <u>NO</u> |
| DOC * | HDPE | 250 ml | 1 | HCL | ↓ |
| Fecal Col. Bact. | HDPE | 250 ml | 1 | EDTA | |
| T. Phosphorous | HDPE | 250 ml | 1 | H ₂ SO ₄ | |
| T. Nitrogen | HDPE | 250 ml | 1 | H ₂ SO ₄ | |
| Diss. Cu and Zn * | HDPE | 250 ml | 1 | HNO ₃ | |
| Hardness, Total Cu and Zn | HDPE | 500 ml | 1 | HNO ₃ | |

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID: _____
Filter blank sample ID: _____
Transfer blank sample ID: _____

Visual and Olfactory Conditions:

Clarity: clear
Color: none
Odor: none
Sheen: none
Floatables: none

LABORATORY DELIVERY

Date: _____ Time: _____

Quality Assurance

Checked By: Solan Lantz Signature: [Signature]
Date Checked: 10-16-18 Time: _____
Data Entered into Database? YES NO initials: _____
Date Entered: _____ Time: _____
Notes: _____

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

YSI Pro Plus (15D100020) _____
YSI Pro DSS 1 _____
YSI Pro DSS 2 _____

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): 0.53
Reference Point (description): SG

Water Quality Measurements

Temperature (°C) 16.2
Specific Conductivity (µs/cm) 272.2
Dissolved Oxygen (mg/L) 9.70

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: AS + MM

Sample Date: 8-8-18

Sample Time: 14:06

PDT:

SITE ID: TYLMI

Base Flow or Storm Event?

Field Filtered Time: 14:05

PST:

Project Number: 14-05806-000

(Must filter within 15 minutes of collection)

Project Name: Redmond Paired Watershed Study



HERRERA

Current Weather and Temp: 85° Sunny

Water Quality Sampling

Sample ID: TYLMI - 20180806

| Parameter | Bottle Type | Bottle Volume | # Bottles | Preservative | Duplicated? |
|---------------------------|-------------|---------------|-----------|--------------------------------|-------------|
| TSS and Turbidity | HDPE | 1L | 1 | NA | <u>NO</u> |
| DOC * | HDPE | 250 ml | 1 | HCL | <u> </u> |
| Fecal Col. Bact. | HDPE | 250 ml | 1 | EDTA | <u> </u> |
| T. Phosphorous | HDPE | 250 ml | 1 | H ₂ SO ₄ | <u> </u> |
| T. Nitrogen | HDPE | 250 ml | 1 | H ₂ SO ₄ | <u> </u> |
| Diss. Cu and Zn * | HDPE | 250 ml | 1 | HNO ₃ | <u> </u> |
| Hardness, Total Cu and Zn | HDPE | 500 ml | 1 | HNO ₃ | |

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID: _____
 Filter blank sample ID: _____
 Transfer blank sample ID: _____

Visual and Olfactory Conditions:

Clarity: clear
 Color: none
 Odor: none
 Sheen: none
 Floatables: none

LABORATORY DELIVERY

Date: _____ Time: _____

Quality Assurance

Checked By: Sohn Bentler Signature: [Signature]
 Date Checked: 10-16-18 Time: _____
 Data Entered into Database? YES NO initials: _____
 Date Entered: _____ Time: _____
 Notes: _____

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

YSI Pro Plus (15D100020) _____

YSI Pro DSS 1 _____

YSI Pro DSS 2 _____

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): 1.58

Reference Point (description): top of culvert

Water Quality Measurements

Temperature (°C) 18.6

Specific Conductivity (µs/cm) 259.2

Dissolved Oxygen (mg/L) 8.86

FIELD SAMPLING SHEET - Redmond Paired Watershed Study

Field Personnel: AS + MM

Sample Date: 8.8.18

Sample Time: 12:40

PDT:

SITE ID: TYLMO

Base Flow or Storm Event?

Field Filtered Time: 12:45

PST:

Project Number: 14-05806-000

(Must filter within 15 minutes of collection)

Project Name: Redmond Paired Watershed Study



Water Quality Sampling

Sample ID: TYLMO-20180808

Current Weather and Temp: 85° Sunny

| Parameter | Bottle Type | Bottle Volume | # Bottles | Preservative | Duplicated? |
|---------------------------|-------------|---------------|-----------|--------------------------------|-------------|
| TSS and Turbidity | HDPE | 1L | 1 | NA | <u>NO</u> |
| DOC * | HDPE | 250 ml | 1 | HCL | ↓ |
| Fecal Col. Bact. | HDPE | 250 ml | 1 | EDTA | |
| T. Phosphorous | HDPE | 250 ml | 1 | H ₂ SO ₄ | |
| T Nitrogen | HDPE | 250 ml | 1 | H ₂ SO ₄ | |
| Diss. Cu and Zn * | HDPE | 250 ml | 1 | HNO ₃ | |
| Hardness, Total Cu and Zn | HDPE | 500 ml | 1 | HNO ₃ | |

Field Meter Calibration

Check which field meter was used and complete the meter calibration form

YSI Pro Plus (15D100020)

YSI Pro DSS 1

YSI Pro DSS 2

Stream Stage Measurement

Indicate reference point for measurement (to nearest 100th of a foot)

Stream Stage (ft): 2.90

Reference Point (description): top of culvert

Water Quality Measurements

Temperature (°C) 17.0

Specific Conductivity (µs/cm) 233.9

Dissolved Oxygen (mg/L) 9.42

* - field filtered with Nalgene 250 ml SFCA 0.45 µm filter and vacuum hand pump

Duplicate sample ID: _____

Filter blank sample ID: _____

Transfer blank sample ID: _____

Visual and Olfactory Conditions:

Clarity: clear

Color: none

Odor: none

Sheen: none

Floatables: none

LABORATORY DELIVERY

Date: _____ Time: _____

Quality Assurance

Checked By: John Smith Signature: [Signature]

Date Checked: 10-10-18 Time: _____

Data Entered into Database? YES NO initials: _____

Date Entered: _____ Time: _____

Notes: _____



HERRERA

Data Quality Assurance Worksheet

Project Name/No./Client: Redmond Paired Watershed Study / 14-05806-000 / City of Redmond

Laboratory/Parameters: OnSite Environmental : TSS, turbidity, hardness, DOC, TP, Dissolved & Total Cu, Zn / AmTest: Total nitrogen, fecal coliform bacteria

Sample Date/Sample ID: 8/08/2018 / All locations, QA52 (MONM)

By G. Catarra

Date 10/10/2018 Page 1 of 2

Checked: initials JL

date 10/16/2018

| Parameter | Completeness/ Methodology | Pre-preservation Holding Times (minutes) | | Total Holding Times (days) | | Method Blanks Reporting Limit | Matrix Spikes/ Surrogate Recovery (%) | | Lab Control Samples Recovery (%) | | Lab Duplicates RPD (%) | | Field Duplicates RPD (%) | | Instrument Calibration/ Performance | ACTION |
|-------------------------------------|------------------------------|--|------|-------------------------------|------|--|---|-------------------|--|-------------------|---------------------------|-------------------|-----------------------------|-------------------|---|--|
| | | Reported | Goal | Reported | Goal | | Reported | Goal ¹ | Reported | Goal ¹ | Reported | Goal ¹ | Reported | Goal ¹ | | |
| TSS | OK / SM 2540D | NA | NA | 6 | ≤7 | ≤1.0 mg/L 1.0 mg/L | NA | NA | 93 | ±20 | 11 | ≤25 | 7.4 | ≤25 | OK | NONE |
| Turbidity | OK / EPA 180.1 | NA | NA | 1 | ≤2 | ≤0.1 NTU 0.1 NTU | NA | NA | NA | ±10 | 2 | ≤25 | 5.2 | ≤25 | OK | NONE |
| Hardness | OK / SM 2340B | NA | NA | 2 | ≤180 | ≤1.0 mg/L 1.0 mg/L | 102,100 | ±25 | 98 | ±15 | 0 | ≤20 | 9.5 | ≤20 | OK | NONE |
| DOC | OK / SM 5310B | <15 | ≤15 | 5 | ≤28 | ≤1.0 mg/L 1.0 mg/L | 114 | ±25 | 112 | ±15 | 2 | ≤20 | 17 | ≤20 | OK | NONE |
| Total Phosphorus | OK / EPA 365.1 | NA | NA | 8 | ≤28 | ≤0.01 mg/L 0.01 mg/L | 91 | ±25 | 83 | ±20 | 8 | ≤20 | 3.5 | ≤20 | OK | None |
| Total Nitrogen (TKN + N+N) | OK/ SM 4500 N-B | NA | NA | 5-14 | ≤28 | ≤0.1 mg/L 0.1 mg/L | 100,104 102,113 | ±25 | 90-110 | ±20 | NC,1.9 24,1.5 | ≤20 | D=0.001 32 | ≤20 | OK | FLAG N+N FOR COLM "J" DUE TO LAB DUP RPD. FLAG N+N FOR MONM "J" DUE TO FIELD DUP RPD. |

¹ If the sample or duplicate value is less than five times the reporting limit, the difference is calculated rather than the relative percent difference (RPD). The QA goal is a difference <2 times the detection limit instead of the number indicated in the goal column.

NA – not applicable or not available; NC – not calculable due to one or more values below the detection limit; NS – field duplicate not sampled.



Data Quality Assurance Worksheet

By G. Catarra

Project Name/No./Client: Redmond Paired Watershed Study / 14-05806-000 / City of Redmond

Date 10/10/2018 Page 2 of 2

Laboratory/Parameters: OnSite Environmental : TSS, turbidity, hardness, DOC, TP, Dissolved & Total Cu, Zn / AmTest: total nitrogen, fecal coliform bacteria

Checked: initials
JL

Sample Date/Sample ID: 8/08/2018 / All locations, QA52 (MONM)

date 10/16/2018

| Parameter | Completeness/ Methodology | Pre-preservation Holding Times (minutes) | | Total Holding Times (days) | | Method Blanks Reporting Limit | Matrix Spikes/ Surrogate Recovery (%) | | Lab Control Samples Recovery (%) | | Lab Duplicates RPD (%) | | Field Duplicates RPD (%) | | Instrument Calibration/ Performance | ACTION |
|---------------------|------------------------------|--|------|-------------------------------|------|--|---|-------------------|--|------|---------------------------|-------------------|-----------------------------|-------------------|---|--------|
| | | Reported | Goal | Reported | Goal | | Reported | Goal ¹ | Reported | Goal | Reported | Goal ¹ | Reported | Goal ¹ | | |
| Total Copper | OK/ EPA 200.8 | NA | NA | 2 | ≤180 | ≤1.0 µg/L 1.0 µg/L | 86,84 | ±25 | NR | ±15 | NC | ≤20 | NC | ≤20 | OK | NONE |
| Total Zinc | OK/ EPA 200.8 | NA | NA | 2 | ≤180 | ≤5.0 µg/L 5.0 µg/L | 109,109 | ±25 | NR | ±15 | NC | ≤20 | 15 | ≤20 | OK | NONE |
| Dissolved Copper | OK/ EPA 200.8 | <15 | ≤15 | 1 | ≤180 | ≤1.0 µg/L 1.0 µg/L | 92,93 | ±25 | NR | ±15 | NC | ≤20 | NC | ≤20 | OK | NONE |
| Dissolved Zinc | OK/ EPA 200.8 | <15 | ≤15 | 1 | ≤180 | ≤5.0 µg/L 5.0 µg/L | 108,109 | ±25 | NR | ±15 | NC | ≤20 | NC | ≤20 | OK | NONE |
| Fecal Coliform | OK/ SM 9222D | NA | NA | 1 | ≤1 | ≤1.0 cfu/ 100mL 10 cfu/ 100mL | NA | NA | NA | NA | 5.1,3.2 | ≤35 | 3.2 | ≤50 | OK | NONE |

¹ If the sample or duplicate value is less than five times the reporting limit, the difference is calculated rather than the relative percent difference (RPD). The QA goal is a difference <2 times the detection limit instead of the number indicated in the goal column.

NA – not applicable or not available; NC – not calculable due to one or more values below the detection limit; NS – field duplicate not sampled.

APPENDIX G

Data Validation Memorandum for Water Quality Monitoring

Herrera Environmental Consultants, Inc.

Internal Memorandum

Date: December 28, 2018
To: Project File 14-05806-019
Copy To:
From: Gina Catarra
Subject: Data Quality Assurance Review of the Redmond Paired Watershed Stormwater Retrofit Effectiveness Water Quality Monitoring Data

This memorandum presents a review of data quality for 247 water samples (including 18 field duplicates, 2 filter blanks, and 2 transfer blank) collected for the Redmond Paired Watershed Stormwater Retrofit Effectiveness Study between October 6, 2017 and August 8, 2018. Onsite Environmental, Inc., of Redmond, Washington analyzed the samples for:

- Total suspended solids (TSS) by Standard Method 2540D
- Turbidity by EPA method 180.1
- Hardness by Standard Method 2340B
- Dissolved organic carbon (DOC) by Standard Method 5310B
- Total phosphorus by EPA method 365.1
- Total and dissolved metals (copper and zinc) by EPA method 200.8.

In addition, AmTest Inc., of Kirkland, Washington analyzed the samples for:

- Total nitrogen (total Kjeldahl nitrogen [TKN] and nitrate + nitrite nitrogen) by Standard Method 4500-N and 4500-NO₃, respectively
- Fecal coliform by Standard Method 9222D.

Results for the following samples were validated.

| Date Collected | Lab SDG | Samples Collected | QC Samples Collected |
|----------------|----------|----------------------------------|---|
| 10/06/17 | 1710-089 | 13 stations (COLM not collected) | 1 field duplicate |
| 10/18/17 | 1710-249 | All 14 stations | 1 field duplicate |
| 11/12/17 | 1711-147 | All 14 stations | 1 field duplicate |
| 11/19/17 | 1711-240 | All 14 stations | 1 field duplicate |
| 12/11/17 | 1712-101 | COLM only | 1 field duplicate, 1 filter blank, 1 transfer blank |
| 12/19/17 | 1712-194 | All 14 stations | 1 field duplicate |
| 1/11/18 | 1801-103 | All 14 stations | 1 field duplicate |
| 1/17/18 | 1801-190 | All 14 stations | 1 field duplicate |
| 1/23/18 | 1801-229 | All 14 stations | 1 field duplicate |
| 1/29/18 | 1801-296 | All 14 stations | 1 field duplicate |
| 2/01/18 | 1802-016 | All 14 stations | 1 field duplicate |
| 2/12/18 | 1802-126 | All 14 stations | 1 field duplicate |
| 2/28/18 | 1802-298 | All 14 stations | 1 field duplicate |
| 3/08/18 | 1803-068 | All 14 stations | 1 field duplicate |
| 3/20/18 | 1803-183 | COLM only | 1 field duplicate, 1 filter blank, 1 transfer blank |
| 5/21/18 | 1805-207 | All 14 stations | 1 field duplicate |
| 6/08/18 | 1806-100 | All 14 stations | 1 field duplicate |
| 8/08/18 | 1808-097 | All 14 stations | 1 field duplicate |

The laboratory's performance was reviewed in accordance with quality control (QC) criteria established in the *Redmond Paired Watershed Study Quality Assurance Project Plan (QAPP)* (Herrera 2015), by the laboratory, and in the specified methods.

Quality control data summaries submitted by the laboratory were reviewed; raw data were not submitted by the laboratory. Data Quality Assurance Worksheets were completed for each laboratory report and are included as an Attachment to this memorandum. Data qualifiers (flags) were added to the sample results in the laboratory reports. Data validation results are summarized below, followed by definitions of data qualifiers.

Custody, Preservation, Holding Times, and Completeness—Acceptable with Qualification

The samples were properly preserved and sample custody was maintained from sample collection to receipt at the laboratory. Samples were analyzed within the required method holding times, with the exception noted below. The laboratory reports were complete and contained results for all samples and tests requested on the chain-of-custody (COC) forms.

The holding time (1 day) was exceeded by 2 days for all samples collected on 6/08/18 for fecal coliform bacteria analysis. Samples were qualified as estimated (flagged J) due to the holding time exceedance, as shown in the table below.

| Date Collected | Lab SDG | Sample Location | Parameter | Reason for Qualification | Flag |
|----------------|----------|-----------------|-------------------------|--------------------------|------|
| 6/08/18 | 1806-100 | All locations | Fecal coliform bacteria | Holding time exceedance | J |

Laboratory Reporting Limits—Acceptable

The laboratory reporting limits met those established in the QAPP. No data were qualified based on laboratory reporting limits.

Method Blank Analysis—Acceptable

Method blanks were analyzed at the required frequency. Method blanks did not contain levels of target analytes above the laboratory reporting limits.

Filter Blank Analysis—Acceptable with Qualification

Filter blanks were collected on 12/11/17 and 3/20/18, and analyzed for DOC and dissolved copper and zinc, as required by the QAPP. With the exceptions noted below, the filter blanks did not contain levels of target analytes above the laboratory reporting limits.

For the filter blank collected on 12/11/17, dissolved copper (4.1 µg/L) was detected above the reporting limit (1.0 µg/L). Dissolved copper was detected in the associated project sample (COLM) above the reporting limit but less than 5 times the filter blank result. The dissolved copper result for sample COLM collected on 12/11/17 was qualified as estimated (flagged J) due to filter blank exceedance, as shown in the table below.

| Date Collected | Lab SDG | Sample Location | Parameter | Reason for Qualification | Flag |
|----------------|----------|-----------------|------------------|--------------------------|------|
| 12/11/17 | 1712-101 | COLM | Dissolved copper | Filter blank exceedance | J |

For the filter blank collected on 3/20/18, dissolved copper (3.8 µg/L) was detected above the reporting limit (1.0 µg/L). However, no data were qualified because dissolved copper was not detected above the laboratory reporting limit in the associated project sample.

Transfer Blank Analysis—Acceptable with Qualification

Transfer blanks were collected on 12/11/17 and 3/20/18, and analyzed for all parameters, as required by the QAPP. With the exceptions noted below, the filter blanks did not contain levels of target analytes above the laboratory reporting limits.

For the transfer blank collected on 12/11/17, turbidity (0.14 NTU), TKN (0.31mg/L), total copper (5.8 µg/L), and dissolved copper (5.5 µg/L) were detected above the laboratory reporting limits. For the transfer blank collected on 3/20/18, nitrate + nitrite (0.051 mg/L), total copper (5.8 µg/L), and dissolved copper (5.0 µg/L) were detected above the laboratory reporting limits. Data were qualified as estimated (flagged J) for any of the parameters listed above when detected above the reporting limits but less than 5 times the transfer blank result, as shown in the table below.

| Date Collected | Lab SDG | Sample Location | Parameter | Reason for Qualification | Flag |
|----------------|----------|-----------------|-------------------|---------------------------|------|
| 12/11/17 | 1712-101 | COLM | Turbidity | Transfer blank exceedance | J |
| 12/11/17 | 1712-101 | COLM | TKN | Transfer blank exceedance | J |
| 12/11/17 | 1712-101 | COLM | Total copper | Transfer blank exceedance | J |
| 12/11/17 | 1712-101 | COLM | Dissolved copper | Transfer blank exceedance | J |
| 3/20/18 | 1803-183 | COLM | Nitrate + nitrite | Transfer blank exceedance | J |

Laboratory Control Sample Analysis—Acceptable

Laboratory control samples (LCS) were analyzed with project samples for TSS, hardness, DOC, total phosphorus, and total nitrogen at the required frequency. The percent recovery values for all parameters met the criteria established in the QAPP.

Matrix Spike Analysis—Acceptable

Matrix spike samples were analyzed for hardness, DOC, total phosphorus, total nitrogen, total copper and zinc, and dissolved copper and zinc. The percent recovery values for all parameters met the control limits established in the QAPP.

Laboratory Duplicate Analysis—Acceptable with Qualification

Laboratory duplicate samples were analyzed for all parameters. The relative percent difference (RPD) was calculated for each analyte where both duplicate values were greater than five times the reporting limit (RL). The difference between duplicate values was calculated if the detected compound concentration was less than five times the RL in either the sample or the duplicate. The RPD values or difference values met the control limits established by the laboratory or specified method, with the exceptions noted below.

As shown in the table below, several laboratory duplicate RPD values did not meet the criteria established in the QAPP. The sample was qualified as estimated (flagged J) due to the laboratory duplicate exceedance.

| Date Collected | Lab SDG | Sample Location | Parameter | Reason for Qualification | Flag |
|----------------|----------|-----------------|-------------------|---------------------------------|------|
| 10/06/17 | 1710-089 | COUMI | Fecal coliform | Laboratory duplicate exceedance | J |
| 1/11/18 | 1801-103 | COLM | Fecal coliform | Laboratory duplicate exceedance | J |
| 6/08/18 | 1806-100 | EVALSS | TSS | Laboratory duplicate exceedance | J |
| 8/08/18 | 1808-097 | COLM | Nitrate + nitrite | Laboratory duplicate exceedance | J |

Field Duplicate Analysis—Acceptable with Qualification

Field duplicates were analyzed for all parameters at the required frequency (18 field duplicates analyzed in total). The RPD was calculated for each analyte where both the values were greater than five times the RL. The difference between the duplicate values was calculated if the detected compound concentration was less than five times the RL in either the sample or the field duplicate. With the exceptions noted below, the RPD values or difference values met the control limits established in the QAPP.

As shown in the table below, several field duplicate values did not meet the criteria established in the QAPP. The sample and associated duplicate were qualified as estimated (flagged J) due to the field duplicate exceedance.

| Date Collected | Lab SDG | Sample Location | Duplicate ID | Parameter | Reason for Qualification | Flag |
|----------------|----------|-----------------|--------------|--|----------------------------|------|
| 10/06/17 | 1710-089 | SEIMS | QA33 | Nitrate + nitrite | Field duplicate exceedance | J |
| 10/18/17 | 1710-249 | COUMI | QA34 | Turbidity and TKN | Field duplicate exceedance | J |
| 11/12/17 | 1711-147 | COUMO | QA35 | Nitrate + nitrite | Field duplicate exceedance | J |
| 11/19/17 | 1711-240 | TYLMO | QA36 | TSS, turbidity, TKN, nitrate + nitrite, total copper, and total zinc | Field duplicate exceedance | J |
| 12/19/17 | 1712-194 | EVAMS | QA39 | Turbidity and TP | Field duplicate exceedance | J |
| 1/23/18 | 1801-229 | SEIMN | QA42 | Nitrate + nitrite | Field duplicate exceedance | J |
| 1/29/18 | 1801-296 | MONMN | QA43 | TSS and turbidity | Field duplicate exceedance | J |
| 2/01/18 | 1802-016 | MONMS | QA44 | Nitrate + nitrite and fecal coliform | Field duplicate exceedance | J |
| 2/12/18 | 1802-126 | TYLMI | QA45 | TSS and turbidity | Field duplicate exceedance | J |
| 2/28/18 | 1802-298 | TOSMO | QA46 | TP and TKN | Field duplicate exceedance | J |
| 5/21/18 | 1805-207 | SEIMS | QA48 | Fecal coliform | Field duplicate exceedance | J |
| 6/08/18 | 1806-100 | COLM | QA51 | TKN | Field duplicate exceedance | J |
| 8/08/18 | 1808-097 | MONM | QA52 | Nitrate + nitrite | Field duplicate exceedance | J |

DEFINITION OF DATA QUALIFIERS

The following are data qualifier definitions applied for this project.

| Data Qualifier | Definition |
|-----------------------|---|
| J | Value is an estimate based on analytical results |
| R | Value is rejected based on analytical results |
| U | Value is below the reporting limit |
| UJ | Value is below the reporting limit and is an estimate based on analytical results |

REFERENCES

Herrera. 2015. Redmond Paired Watershed Study Quality Assurance Project Plan. Prepared by Herrera Environmental Consultants, Inc., Seattle, Washington. December 31.

APPENDIX H

Summary Statistics for Pollutant Concentrations Measured in Storm Event and Base Flow Samples

Table H-1. Summary Statistics for Total Suspended Solids Concentrations Measured in Storm Event and Base Flow Samples.

| Station | n | Minimum (mg/L) | 25th Percentile (mg/L) | Median (mg/L) | 75th Percentile (mg/L) | Maximum (mg/L) | Interquartile Range (mg/L) | Percent Detected | Percent Exceeding Standard |
|----------------------------|----|-------------------|---------------------------|------------------|---------------------------|-------------------|-------------------------------|---------------------|----------------------------------|
| Base Flow Samples | | | | | | | | | |
| EVALSS | 4 | 2.8 | 4.5 | 7.4 | 8.6 | 8.6 | 4.1 | 100% | NA |
| EVAMS | 4 | 3.4 | 4.7 | 7.1 | 8.9 | 9.6 | 4.2 | 100% | NA |
| MONM | 4 | 1.6 | 2.0 | 6.7 | 12 | 13 | 10 | 100% | NA |
| MONMN | 4 | 1.0 | 1.5 | 3.1 | 15 | 26 | 14 | 100% | NA |
| MONMS | 4 | 2.0 | 2.1 | 2.2 | 2.3 | 2.4 | 0.2 | 100% | NA |
| TOSMO | 4 | 0.5 | 1.6 | 2.7 | 2.8 | 2.8 | 1.3 | 75% | NA |
| TOSMI | 4 | 1.6 | 2.6 | 4.9 | 13 | 20 | 11 | 100% | NA |
| COLM | 5 | 0.5 | 0.5 | 0.5 | 1.6 | 17 | 1.1 | 40% | NA |
| SEIMN | 4 | 3.8 | 4.2 | 4.9 | 12 | 19 | 7.9 | 100% | NA |
| SEIMS | 4 | 4.2 | 4.9 | 5.9 | 7.3 | 8.4 | 2.4 | 100% | NA |
| COUMO | 4 | 2.2 | 2.5 | 3.5 | 4.3 | 4.4 | 1.8 | 100% | NA |
| COUMI | 4 | 3.4 | 7.7 | 14 | 108 | 200 | 100 | 100% | NA |
| TYLMO | 4 | 1.2 | 1.5 | 3.6 | 7.6 | 9.8 | 6.1 | 100% | NA |
| TYLMI | 4 | 5.4 | 5.8 | 8.6 | 16 | 20 | 9.7 | 100% | NA |
| Storm Event Samples | | | | | | | | | |
| EVALSS | 12 | 4.4 | 7.3 | 15 | 32 | 130 | 24 | 100% | NA |
| EVAMS | 12 | 2.8 | 8.8 | 11 | 17 | 40 | 8.2 | 100% | NA |
| MONM | 12 | 3.4 | 9.6 | 20 | 33 | 51 | 23 | 100% | NA |
| MONMN | 12 | 2.4 | 6.0 | 12 | 34 | 71 | 28 | 100% | NA |
| MONMS | 12 | 2.0 | 4.7 | 6.0 | 13 | 27 | 7.8 | 100% | NA |
| TOSMO | 12 | 21 | 32 | 72 | 165 | 370 | 133 | 100% | NA |
| TOSMI | 12 | 31 | 45 | 77 | 173 | 610 | 128 | 100% | NA |
| COLM | 12 | 0.5 | 1.0 | 1.7 | 3.4 | 17 | 2.5 | 75% | NA |
| SEIMN | 12 | 6.2 | 11 | 20 | 80 | 180 | 69 | 100% | NA |
| SEIMS | 12 | 2.4 | 22 | 27 | 36 | 49 | 15 | 100% | NA |
| COUMO | 12 | 11 | 17 | 25 | 56 | 99 | 39 | 100% | NA |
| COUMI | 12 | 11 | 23 | 39 | 79 | 140 | 57 | 100% | NA |
| TYLMO | 12 | 8.8 | 15 | 23 | 53 | 80 | 38 | 100% | NA |
| TYLMI | 12 | 3.00 | 6.5 | 8.7 | 34 | 68 | 27 | 100% | NA |

mg/L: milligrams per liter

All summary statistics were calculated using values of half the reporting limit for non-detect values.

Table H-2. Summary Statistics for Total Turbidity Concentrations Measured in Storm Event and Base Flow Samples.

| Station | n | Minimum (NTU) | 25th Percentile (NTU) | Median (NTU) | 75th Percentile (NTU) | Maximum (NTU) | Interquartile Range (NTU) | Percent Detected | Percent Exceeding Standard |
|----------------------------|----|---------------|-----------------------|--------------|-----------------------|---------------|---------------------------|------------------|----------------------------|
| Base Flow Samples | | | | | | | | | |
| EVALSS | 4 | 2.0 | 2.0 | 2.5 | 3.2 | 3.5 | 1.2 | 100% | NA |
| EVAMS | 4 | 1.3 | 1.9 | 2.7 | 3.0 | 3.1 | 1.1 | 100% | NA |
| MONM | 4 | 1.2 | 1.8 | 2.4 | 5.2 | 7.9 | 3.5 | 100% | NA |
| MONMN | 4 | 1.0 | 1.1 | 1.6 | 4.2 | 6.4 | 3.1 | 100% | NA |
| MONMS | 4 | 0.7 | 0.8 | 1.2 | 1.6 | 1.6 | 0.8 | 100% | NA |
| TOSMO | 4 | 0.7 | 0.7 | 1.0 | 1.7 | 2.1 | 0.9 | 100% | NA |
| TOSMI | 4 | 0.5 | 0.8 | 1.6 | 3.0 | 4.0 | 2.2 | 100% | NA |
| COLM | 5 | 0.4 | 0.5 | 1.0 | 1.3 | 2.0 | 0.8 | 100% | NA |
| SEIMN | 4 | 1.2 | 1.6 | 2.0 | 2.4 | 2.7 | 0.8 | 100% | NA |
| SEIMS | 4 | 1.7 | 1.9 | 2.5 | 3.1 | 3.1 | 1.2 | 100% | NA |
| COUMO | 4 | 0.9 | 1.2 | 1.7 | 2.8 | 3.6 | 1.5 | 100% | NA |
| COUMI | 4 | 1.8 | 3.7 | 5.7 | 16.0 | 26.0 | 12.3 | 100% | NA |
| TYLMO | 4 | 1.4 | 1.4 | 1.5 | 1.8 | 2.0 | 0.4 | 100% | NA |
| TYLMI | 4 | 1.2 | 2.0 | 3.6 | 6.5 | 8.4 | 4.5 | 100% | NA |
| Storm Event Samples | | | | | | | | | |
| EVALSS | 12 | 1.2 | 2.8 | 4.7 | 8.0 | 39.0 | 5.2 | 100% | NA |
| EVAMS | 12 | 0.7 | 2.4 | 3.4 | 5.5 | 14.0 | 3.1 | 100% | NA |
| MONM | 12 | 2.4 | 5.3 | 9.7 | 12.5 | 18.0 | 7.2 | 100% | NA |
| MONMN | 12 | 2.1 | 3.4 | 9.3 | 14.5 | 24.0 | 11.1 | 100% | NA |
| MONMS | 12 | 1.6 | 2.4 | 4.2 | 5.8 | 8.3 | 3.4 | 100% | NA |
| TOSMO | 12 | 8.7 | 12.5 | 23.0 | 45.0 | 52.0 | 32.5 | 100% | NA |
| TOSMI | 12 | 1.8 | 11.8 | 24.0 | 49.0 | 73.0 | 37.2 | 100% | NA |
| COLM | 12 | 0.4 | 0.5 | 0.7 | 1.2 | 2.0 | 0.7 | 100% | NA |
| SEIMN | 12 | 1.6 | 3.7 | 7.5 | 22.0 | 49.0 | 18.4 | 100% | NA |
| SEIMS | 12 | 1.7 | 4.5 | 6.7 | 9.6 | 16.0 | 5.2 | 100% | NA |
| COUMO | 12 | 6.3 | 8.3 | 10.0 | 17.0 | 34.0 | 8.8 | 100% | NA |
| COUMI | 12 | 5.2 | 6.1 | 11.0 | 16.5 | 51.0 | 10.4 | 100% | NA |
| TYLMO | 12 | 3.5 | 5.1 | 10.5 | 16.5 | 28.0 | 11.4 | 100% | NA |
| TYLMI | 12 | 3.3 | 4.8 | 6.0 | 9.0 | 18.0 | 4.2 | 100% | NA |

NTU: Nephelometric Turbidity Unit

All summary statistics were calculated using values of half the reporting limit for non-detect values.

Table H-3. Summary Statistics for Total Hardness Concentrations Measured in Storm Event and Base Flow Samples.

| Station | n | Minimum (mg/L) | 25th Percentile (mg/L) | Median (mg/L) | 75th Percentile (mg/L) | Maximum (mg/L) | Interquartile Range (mg/L) | Percent Detected | Percent Exceeding Standard |
|----------------------------|----|-------------------|---------------------------|------------------|---------------------------|-------------------|-------------------------------|---------------------|----------------------------------|
| Base Flow Samples | | | | | | | | | |
| EVALSS | 4 | 76 | 83 | 90 | 91 | 91 | 9 | 100% | NA |
| EVAMS | 4 | 81 | 91 | 100 | 105 | 110 | 15 | 100% | NA |
| MONM | 4 | 78 | 88 | 99 | 100 | 100 | 12 | 100% | NA |
| MONMN | 4 | 59 | 71 | 86 | 94 | 99 | 23 | 100% | NA |
| MONMS | 4 | 120 | 135 | 160 | 175 | 180 | 40 | 100% | NA |
| TOSMO | 4 | 110 | 115 | 120 | 120 | 120 | 5 | 100% | NA |
| TOSMI | 4 | 120 | 125 | 135 | 140 | 140 | 15 | 100% | NA |
| COLM | 5 | 8 | 9 | 10 | 13 | 27 | 4 | 100% | NA |
| SEIMN | 4 | 22 | 29 | 42 | 47 | 47 | 18 | 100% | NA |
| SEIMS | 4 | 40 | 45 | 51 | 54 | 55 | 9 | 100% | NA |
| COUMO | 4 | 110 | 115 | 120 | 130 | 140 | 15 | 100% | NA |
| COUMI | 4 | 120 | 135 | 155 | 160 | 160 | 25 | 100% | NA |
| TYLMO | 4 | 75 | 81 | 92 | 97 | 98 | 16 | 100% | NA |
| TYLMI | 4 | 75 | 93 | 110 | 115 | 120 | 23 | 100% | NA |
| Storm Event Samples | | | | | | | | | |
| EVALSS | 12 | 53 | 64 | 71 | 77 | 99 | 13 | 100% | NA |
| EVAMS | 12 | 55 | 66 | 76 | 85 | 110 | 19 | 100% | NA |
| MONM | 12 | 19 | 50 | 60 | 74 | 100 | 24 | 100% | NA |
| MONMN | 12 | 32 | 45 | 47 | 55 | 110 | 10 | 100% | NA |
| MONMS | 12 | 48 | 61 | 84 | 104 | 170 | 43 | 100% | NA |
| TOSMO | 12 | 41 | 48 | 70 | 87 | 120 | 39 | 100% | NA |
| TOSMI | 12 | 30 | 39 | 49 | 70 | 130 | 31 | 100% | NA |
| COLM | 12 | 7 | 8 | 8 | 12 | 14 | 4 | 100% | NA |
| SEIMN | 12 | 18 | 19 | 21 | 31 | 45 | 12 | 100% | NA |
| SEIMS | 12 | 9 | 31 | 36 | 46 | 52 | 15 | 100% | NA |
| COUMO | 12 | 35 | 52 | 56 | 71 | 120 | 20 | 100% | NA |
| COUMI | 12 | 52 | 57 | 63 | 85 | 150 | 28 | 100% | NA |
| TYLMO | 12 | 21 | 27 | 30 | 41 | 100 | 14 | 100% | NA |
| TYLMI | 12 | 34 | 47 | 58 | 67 | 110 | 20 | 100% | NA |

mg/L: milligrams per liter

All summary statistics were calculated using values of half the reporting limit for non-detect values.

Table H-4. Summary Statistics for Dissolved Organic Carbon Concentrations Measured in Storm Event and Base Flow Samples.

| Station | n | Minimum (mg/L) | 25th Percentile (mg/L) | Median (mg/L) | 75th Percentile (mg/L) | Maximum (mg/L) | Interquartile Range (mg/L) | Percent Detected | Percent Exceeding Standard |
|----------------------------|----|-------------------|---------------------------|------------------|---------------------------|-------------------|-------------------------------|---------------------|----------------------------------|
| Base Flow Samples | | | | | | | | | |
| EVALSS | 4 | 1.6 | 1.8 | 2.2 | 3.0 | 3.5 | 1.3 | 100% | NA |
| EVAMS | 4 | 1.9 | 2.2 | 2.9 | 3.7 | 4.2 | 1.5 | 100% | NA |
| MONM | 4 | 2.7 | 2.8 | 3.0 | 3.5 | 3.8 | 0.8 | 100% | NA |
| MONMN | 4 | 3.3 | 3.4 | 3.5 | 3.7 | 3.8 | 0.3 | 100% | NA |
| MONMS | 4 | 3.5 | 3.5 | 3.8 | 4.4 | 4.7 | 0.9 | 100% | NA |
| TOSMO | 4 | 1.5 | 1.9 | 2.3 | 2.8 | 3.3 | 1.0 | 100% | NA |
| TOSMI | 4 | 2.5 | 2.5 | 2.5 | 3.1 | 3.7 | 0.6 | 100% | NA |
| COLM | 5 | 7.2 | 9.2 | 9.6 | 13.0 | 13.0 | 3.8 | 100% | NA |
| SEIMN | 4 | 1.3 | 1.4 | 2.3 | 4.8 | 6.4 | 3.5 | 100% | NA |
| SEIMS | 4 | 2.6 | 2.8 | 3.1 | 3.8 | 4.3 | 1.0 | 100% | NA |
| COUMO | 4 | 2.1 | 2.3 | 3.1 | 3.8 | 3.9 | 1.5 | 100% | NA |
| COUMI | 4 | 2.4 | 2.5 | 2.7 | 3.1 | 3.3 | 0.7 | 100% | NA |
| TYLMO | 4 | 3.1 | 3.2 | 3.3 | 3.7 | 4.0 | 0.5 | 100% | NA |
| TYLMI | 4 | 1.8 | 1.9 | 2.3 | 4.0 | 5.3 | 2.1 | 100% | NA |
| Storm Event Samples | | | | | | | | | |
| EVALSS | 12 | 2.4 | 4.3 | 4.7 | 6.1 | 13.0 | 1.8 | 100% | NA |
| EVAMS | 12 | 2.8 | 4.5 | 4.9 | 6.3 | 12.0 | 1.9 | 100% | NA |
| MONM | 12 | 3.4 | 4.7 | 5.3 | 6.2 | 10.0 | 1.6 | 100% | NA |
| MONMN | 12 | 3.9 | 4.5 | 4.9 | 6.1 | 10.0 | 1.7 | 100% | NA |
| MONMS | 12 | 3.4 | 5.3 | 5.6 | 6.7 | 8.1 | 1.4 | 100% | NA |
| TOSMO | 12 | 4.1 | 4.5 | 5.0 | 6.8 | 10.0 | 2.3 | 100% | NA |
| TOSMI | 12 | 3.5 | 4.1 | 5.0 | 7.6 | 15.0 | 3.5 | 100% | NA |
| COLM | 12 | 8.8 | 9.4 | 10.0 | 12.5 | 15.0 | 3.1 | 100% | NA |
| SEIMN | 12 | 2.2 | 6.7 | 7.2 | 7.8 | 12.0 | 1.1 | 100% | NA |
| SEIMS | 12 | 3.6 | 5.7 | 6.9 | 8.9 | 15.0 | 3.2 | 100% | NA |
| COUMO | 12 | 3.7 | 4.0 | 4.2 | 7.2 | 9.4 | 3.3 | 100% | NA |
| COUMI | 12 | 3.4 | 3.7 | 3.9 | 8.9 | 12.0 | 5.2 | 100% | NA |
| TYLMO | 12 | 3.1 | 3.3 | 3.9 | 5.2 | 6.1 | 1.9 | 100% | NA |
| TYLMI | 12 | 2.8 | 5.2 | 5.9 | 6.3 | 8.9 | 1.1 | 100% | NA |

mg/L: milligrams per liter

All summary statistics were calculated using values of half the reporting limit for non-detect values.

Table H-5. Summary Statistics for Fecal Coliform Concentrations Measured in Storm Event and Base Flow Samples.

| Station | n | Minimum (CFU/100 mL) | 25th Percentile (CFU/100 mL) | Median (CFU/100 mL) | 75th Percentile (CFU/100 mL) | Maximum (CFU/100 mL) | Interquartile Range (CFU/100 mL) | Percent Detected | Percent Exceeding Standard ^a |
|----------------------------|----|----------------------------|---------------------------------|------------------------|---------------------------------|-------------------------|-------------------------------------|---------------------|---|
| Base Flow Samples | | | | | | | | | |
| EVALSS | 4 | 14 | 17 | 50 | 130 | 180 | 113 | 100% | 0% |
| EVAMS | 4 | 22 | 56 | 155 | 710 | 1,200 | 654 | 100% | 50% |
| MONM | 4 | 2 | 36 | 175 | 1,690 | 3,100 | 1,654 | 100% | 50% |
| MONMN | 4 | 2 | 31 | 60 | 120 | 180 | 89 | 100% | 0% |
| MONMS | 4 | 1 | 1 | 13 | 27 | 30 | 26 | 75% | 0% |
| TOSMO | 4 | 2 | 46 | 120 | 1,325 | 2,500 | 1,279 | 100% | 25% |
| TOSMI | 4 | 6 | 26 | 88 | 145 | 160 | 120 | 100% | 0% |
| COLM | 5 | 1 | 2 | 18 | 38 | 50 | 36 | 80% | 0% |
| SEIMN | 4 | 2 | 4 | 24 | 201 | 360 | 198 | 100% | 25% |
| SEIMS | 4 | 1 | 3 | 43 | 100 | 120 | 97 | 75% | 0% |
| COUMO | 4 | 150 | 175 | 310 | 655 | 890 | 480 | 100% | 50% |
| COUMI | 4 | 2 | 9 | 68 | 190 | 260 | 182 | 100% | 25% |
| TYLMO | 4 | 7 | 84 | 165 | 295 | 420 | 212 | 100% | 25% |
| TYLMI | 4 | 1 | 4 | 9 | 44 | 78 | 40 | 75% | 0% |
| Storm Event Samples | | | | | | | | | |
| EVALSS | 12 | 10 | 33 | 60 | 170 | 1,100 | 138 | 100% | 25% |
| EVAMS | 12 | 2 | 21 | 33 | 76 | 1,800 | 55 | 100% | 17% |
| MONM | 12 | 10 | 55 | 130 | 335 | 1,500 | 280 | 100% | 33% |
| MONMN | 12 | 6 | 18 | 53 | 215 | 730 | 198 | 100% | 25% |
| MONMS | 12 | 1 | 50 | 144 | 390 | 2,300 | 340 | 92% | 42% |
| TOSMO | 12 | 120 | 385 | 790 | 2,250 | 190,000 | 1,865 | 100% | 83% |
| TOSMI | 12 | 98 | 380 | 870 | 1,800 | 62,000 | 1,420 | 100% | 83% |
| COLM | 12 | 1 | 8 | 18 | 49 | 380 | 42 | 92% | 8% |
| SEIMN | 12 | 1 | 8 | 19 | 60 | 300 | 53 | 83% | 8% |
| SEIMS | 12 | 1 | 8 | 135 | 270 | 760 | 263 | 92% | 25% |
| COUMO | 12 | 56 | 335 | 420 | 735 | 3,000 | 400 | 100% | 92% |
| COUMI | 12 | 76 | 94 | 345 | 695 | 1,600 | 601 | 100% | 67% |
| TYLMO | 12 | 90 | 180 | 465 | 805 | 2,400 | 625 | 100% | 75% |
| TYLMI | 12 | 5 | 55 | 85 | 315 | 1,100 | 260 | 100% | 25% |

CFU/100 mL: Coliform forming units per 100 milliliters

All summary statistics were calculated using values of half the reporting limit for non-detect values.

^a Percentage of samples exceeding recreational use criteria for bacteria from Washington Administrative Code 173-201A.

Table H-6. Summary Statistics for Total Phosphorus Concentrations Measured in Storm Event and Base Flow Samples.

| Station | n | Minimum (mg/L) | 25th Percentile (mg/L) | Median (mg/L) | 75th Percentile (mg/L) | Maximum (mg/L) | Interquartile Range (mg/L) | Percent Detected | Percent Exceeding Standard |
|----------------------------|----|-------------------|---------------------------|------------------|---------------------------|-------------------|-------------------------------|---------------------|----------------------------------|
| Base Flow Samples | | | | | | | | | |
| EVALSS | 4 | 0.005 | 0.011 | 0.029 | 0.042 | 0.042 | 0.031 | 75% | NA |
| EVAMS | 4 | 0.005 | 0.009 | 0.021 | 0.037 | 0.043 | 0.028 | 75% | NA |
| MONM | 4 | 0.005 | 0.024 | 0.043 | 0.066 | 0.088 | 0.042 | 75% | NA |
| MONMN | 4 | 0.011 | 0.031 | 0.059 | 0.109 | 0.150 | 0.079 | 100% | NA |
| MONMS | 4 | 0.023 | 0.025 | 0.028 | 0.030 | 0.030 | 0.005 | 100% | NA |
| TOSMO | 4 | 0.042 | 0.054 | 0.068 | 0.077 | 0.083 | 0.023 | 100% | NA |
| TOSMI | 4 | 0.031 | 0.049 | 0.068 | 0.078 | 0.086 | 0.030 | 100% | NA |
| COLM | 5 | 0.005 | 0.010 | 0.014 | 0.035 | 0.041 | 0.025 | 80% | NA |
| SEIMN | 4 | 0.005 | 0.020 | 0.043 | 0.052 | 0.053 | 0.032 | 75% | NA |
| SEIMS | 4 | 0.013 | 0.025 | 0.041 | 0.052 | 0.059 | 0.027 | 100% | NA |
| COUMO | 4 | 0.035 | 0.053 | 0.073 | 0.078 | 0.080 | 0.026 | 100% | NA |
| COUMI | 4 | 0.056 | 0.088 | 0.125 | 0.140 | 0.150 | 0.052 | 100% | NA |
| TYLMO | 4 | 0.019 | 0.038 | 0.061 | 0.082 | 0.099 | 0.045 | 100% | NA |
| TYLMI | 4 | 0.013 | 0.021 | 0.038 | 0.048 | 0.048 | 0.027 | 100% | NA |
| Storm Event Samples | | | | | | | | | |
| EVALSS | 12 | 0.005 | 0.016 | 0.023 | 0.040 | 0.130 | 0.024 | 92% | NA |
| EVAMS | 12 | 0.005 | 0.013 | 0.019 | 0.030 | 0.068 | 0.018 | 83% | NA |
| MONM | 12 | 0.017 | 0.034 | 0.043 | 0.057 | 0.120 | 0.023 | 100% | NA |
| MONMN | 12 | 0.014 | 0.025 | 0.035 | 0.062 | 0.190 | 0.037 | 100% | NA |
| MONMS | 12 | 0.017 | 0.026 | 0.032 | 0.043 | 0.058 | 0.018 | 100% | NA |
| TOSMO | 12 | 0.045 | 0.077 | 0.108 | 0.155 | 0.340 | 0.078 | 100% | NA |
| TOSMI | 12 | 0.048 | 0.053 | 0.091 | 0.180 | 0.430 | 0.127 | 100% | NA |
| COLM | 12 | 0.005 | 0.005 | 0.012 | 0.014 | 0.037 | 0.009 | 58% | NA |
| SEIMN | 12 | 0.014 | 0.022 | 0.035 | 0.072 | 0.250 | 0.050 | 100% | NA |
| SEIMS | 12 | 0.034 | 0.038 | 0.050 | 0.060 | 0.075 | 0.023 | 100% | NA |
| COUMO | 12 | 0.039 | 0.045 | 0.064 | 0.108 | 0.170 | 0.063 | 100% | NA |
| COUMI | 12 | 0.038 | 0.060 | 0.105 | 0.140 | 0.320 | 0.080 | 100% | NA |
| TYLMO | 12 | 0.024 | 0.037 | 0.083 | 0.100 | 0.140 | 0.063 | 100% | NA |
| TYLMI | 12 | 0.020 | 0.027 | 0.037 | 0.059 | 0.110 | 0.032 | 100% | NA |

mg/L: milligrams per liter

All summary statistics were calculated using values of half the reporting limit for non-detect values.

Table H-7. Summary Statistics for Total Nitrogen (NOX & TKN) Concentrations Measured in Storm Event and Base Flow Samples.

| Station | n | Minimum (mg/L) | 25th Percentile (mg/L) | Median (mg/L) | 75th Percentile (mg/L) | Maximum (mg/L) | Interquartile Range (mg/L) | Percent Detected | Percent Exceeding Standard |
|----------------------------|----|-------------------|---------------------------|------------------|---------------------------|-------------------|-------------------------------|---------------------|----------------------------------|
| Base Flow Samples | | | | | | | | | |
| | 4 | 1.20 | 1.30 | 1.56 | 1.82 | 1.92 | 0.52 | 100% | NA |
| EVAMS | 4 | 1.78 | 1.96 | 2.25 | 2.39 | 2.41 | 0.43 | 100% | NA |
| MONM | 4 | 0.32 | 0.35 | 0.40 | 0.59 | 0.76 | 0.25 | 100% | NA |
| MONMN | 4 | 0.31 | 0.36 | 0.42 | 0.46 | 0.47 | 0.10 | 100% | NA |
| MONMS | 4 | 0.11 | 0.19 | 0.32 | 0.73 | 1.09 | 0.54 | 100% | NA |
| TOSMO | 4 | 0.57 | 0.60 | 0.68 | 0.79 | 0.84 | 0.19 | 100% | NA |
| TOSMI | 4 | 0.80 | 0.81 | 0.82 | 0.93 | 1.04 | 0.12 | 100% | NA |
| COLM | 5 | 0.17 | 0.55 | 0.68 | 1.17 | 3.80 | 0.62 | 100% | NA |
| SEIMN | 4 | 0.24 | 0.32 | 0.43 | 0.52 | 0.57 | 0.20 | 100% | NA |
| SEIMS | 4 | 0.23 | 0.24 | 0.31 | 0.54 | 0.70 | 0.31 | 100% | NA |
| COUMO | 4 | 0.40 | 0.45 | 0.54 | 0.71 | 0.84 | 0.27 | 100% | NA |
| COUMI | 4 | 0.35 | 0.53 | 0.74 | 0.81 | 0.84 | 0.29 | 100% | NA |
| TYLMO | 4 | 0.38 | 0.42 | 0.47 | 0.82 | 1.15 | 0.41 | 100% | NA |
| TYLMI | 4 | 1.06 | 1.08 | 1.18 | 1.32 | 1.39 | 0.24 | 100% | NA |
| Storm Event Samples | | | | | | | | | |
| EVALSS | 12 | 1.52 | 1.75 | 1.89 | 2.09 | 2.60 | 0.34 | 100% | NA |
| EVAMS | 12 | 1.77 | 2.05 | 2.23 | 2.38 | 2.78 | 0.33 | 100% | NA |
| MONM | 12 | 0.56 | 0.70 | 0.94 | 1.01 | 1.31 | 0.31 | 100% | NA |
| MONMN | 12 | 0.36 | 0.57 | 0.78 | 1.19 | 1.34 | 0.63 | 100% | NA |
| MONMS | 12 | 0.37 | 0.77 | 0.90 | 1.09 | 1.34 | 0.33 | 100% | NA |
| TOSMO | 12 | 0.80 | 0.94 | 1.21 | 1.37 | 1.89 | 0.43 | 100% | NA |
| TOSMI | 12 | 0.67 | 0.92 | 1.12 | 1.43 | 2.33 | 0.51 | 100% | NA |
| COLM | 12 | 0.26 | 0.49 | 0.62 | 0.89 | 2.73 | 0.40 | 100% | NA |
| SEIMN | 12 | 0.37 | 0.63 | 0.72 | 0.87 | 3.70 | 0.24 | 100% | NA |
| SEIMS | 12 | 0.65 | 0.72 | 0.77 | 0.98 | 1.28 | 0.26 | 100% | NA |
| COUMO | 12 | 0.73 | 0.88 | 0.99 | 1.15 | 1.61 | 0.27 | 100% | NA |
| COUMI | 12 | 0.42 | 0.78 | 0.89 | 1.12 | 2.25 | 0.34 | 100% | NA |
| TYLMO | 12 | 0.59 | 0.69 | 0.78 | 1.05 | 1.74 | 0.36 | 100% | NA |
| TYLMI | 12 | 0.66 | 0.96 | 1.04 | 1.40 | 1.44 | 0.44 | 100% | NA |

mg/L: milligrams per liter

All summary statistics were calculated using values of half the reporting limit for non-detect values.

Table H-8. Summary Statistics for Nitrate + Nitrite Concentrations Measured in Storm Event and Base Flow Samples.

| Station | n | Minimum (mg/L) | 25th Percentile (mg/L) | Median (mg/L) | 75th Percentile (mg/L) | Maximum (mg/L) | Interquartile Range (mg/L) | Percent Detected | Percent Exceeding Standard |
|----------------------------|----|-------------------|---------------------------|------------------|---------------------------|-------------------|-------------------------------|---------------------|----------------------------------|
| Base Flow Samples | | | | | | | | | |
| EVALSS | 4 | 1.20 | 1.30 | 1.45 | 1.55 | 1.60 | 0.25 | 100% | NA |
| EVAMS | 4 | 1.60 | 1.70 | 1.85 | 1.95 | 2.00 | 0.25 | 100% | NA |
| MONM | 4 | 0.18 | 0.19 | 0.26 | 0.35 | 0.38 | 0.16 | 100% | NA |
| MONMN | 4 | 0.07 | 0.13 | 0.25 | 0.32 | 0.33 | 0.19 | 100% | NA |
| MONMS | 4 | 0.01 | 0.01 | 0.14 | 0.45 | 0.62 | 0.43 | 75% | NA |
| TOSMO | 4 | 0.54 | 0.56 | 0.60 | 0.63 | 0.63 | 0.07 | 100% | NA |
| TOSMI | 4 | 0.65 | 0.66 | 0.75 | 0.82 | 0.82 | 0.16 | 100% | NA |
| COLM | 5 | 0.03 | 0.04 | 0.23 | 0.28 | 2.70 | 0.24 | 100% | NA |
| SEIMN | 4 | 0.12 | 0.18 | 0.24 | 0.27 | 0.29 | 0.09 | 100% | NA |
| SEIMS | 4 | 0.17 | 0.20 | 0.24 | 0.26 | 0.28 | 0.06 | 100% | NA |
| COUMO | 4 | 0.26 | 0.33 | 0.44 | 0.49 | 0.49 | 0.16 | 100% | NA |
| COUMI | 4 | 0.26 | 0.28 | 0.33 | 0.47 | 0.59 | 0.19 | 100% | NA |
| TYLMO | 4 | 0.32 | 0.33 | 0.36 | 0.51 | 0.64 | 0.18 | 100% | NA |
| TYLMI | 4 | 0.61 | 0.86 | 1.10 | 1.10 | 1.10 | 0.25 | 100% | NA |
| Storm Event Samples | | | | | | | | | |
| EVALSS | 12 | 1.00 | 1.20 | 1.30 | 1.50 | 1.90 | 0.30 | 100% | NA |
| EVAMS | 12 | 1.20 | 1.40 | 1.60 | 1.90 | 2.30 | 0.50 | 100% | NA |
| MONM | 12 | 0.19 | 0.28 | 0.36 | 0.42 | 0.55 | 0.14 | 100% | NA |
| MONMN | 12 | 0.12 | 0.22 | 0.26 | 0.38 | 0.81 | 0.16 | 100% | NA |
| MONMS | 12 | 0.22 | 0.25 | 0.48 | 0.54 | 0.87 | 0.29 | 100% | NA |
| TOSMO | 12 | 0.12 | 0.37 | 0.44 | 0.56 | 0.93 | 0.19 | 100% | NA |
| TOSMI | 12 | 0.14 | 0.29 | 0.46 | 0.61 | 0.87 | 0.32 | 100% | NA |
| COLM | 12 | 0.01 | 0.03 | 0.06 | 0.11 | 0.29 | 0.08 | 92% | NA |
| SEIMN | 12 | 0.13 | 0.16 | 0.19 | 0.36 | 2.60 | 0.21 | 100% | NA |
| SEIMS | 12 | 0.07 | 0.17 | 0.21 | 0.23 | 0.39 | 0.06 | 100% | NA |
| COUMO | 12 | 0.22 | 0.30 | 0.36 | 0.51 | 0.52 | 0.21 | 100% | NA |
| COUMI | 12 | 0.08 | 0.21 | 0.28 | 0.39 | 0.62 | 0.19 | 100% | NA |
| TYLMO | 12 | 0.01 | 0.22 | 0.34 | 0.38 | 0.46 | 0.16 | 92% | NA |
| TYLMI | 12 | 0.07 | 0.43 | 0.47 | 0.59 | 1.10 | 0.16 | 100% | NA |

mg/L: milligrams per liter

All summary statistics were calculated using values of half the reporting limit for non-detect values.

Table H-9. Summary Statistics for Total Nitrogen (TKN) Concentrations Measured in Storm Event and Base Flow Samples.

| Station | n | Minimum (mg/L) | 25th Percentile (mg/L) | Median (mg/L) | 75th Percentile (mg/L) | Maximum (mg/L) | Interquartile Range (mg/L) | Percent Detected | Percent Exceeding Standard |
|----------------------------|----|-------------------|---------------------------|------------------|---------------------------|-------------------|-------------------------------|---------------------|----------------------------------|
| Base Flow Samples | | | | | | | | | |
| EVALSS | 4 | 0.05 | 0.05 | 0.09 | 0.27 | 0.42 | 0.22 | 50% | NA |
| EVAMS | 4 | 0.14 | 0.16 | 0.35 | 0.54 | 0.56 | 0.38 | 100% | NA |
| MONM | 4 | 0.05 | 0.12 | 0.20 | 0.30 | 0.38 | 0.18 | 75% | NA |
| MONMN | 4 | 0.05 | 0.09 | 0.17 | 0.29 | 0.37 | 0.20 | 75% | NA |
| MONMS | 4 | 0.05 | 0.08 | 0.23 | 0.41 | 0.47 | 0.34 | 75% | NA |
| TOSMO | 4 | 0.05 | 0.05 | 0.08 | 0.21 | 0.30 | 0.16 | 50% | NA |
| TOSMI | 4 | 0.05 | 0.05 | 0.09 | 0.26 | 0.40 | 0.21 | 50% | NA |
| COLM | 5 | 0.13 | 0.45 | 0.52 | 0.89 | 1.10 | 0.44 | 100% | NA |
| SEIMN | 4 | 0.05 | 0.08 | 0.17 | 0.34 | 0.45 | 0.26 | 75% | NA |
| SEIMS | 4 | 0.05 | 0.05 | 0.08 | 0.32 | 0.53 | 0.27 | 50% | NA |
| COUMO | 4 | 0.05 | 0.05 | 0.18 | 0.34 | 0.36 | 0.29 | 50% | NA |
| COUMI | 4 | 0.05 | 0.15 | 0.33 | 0.46 | 0.52 | 0.31 | 75% | NA |
| TYLMO | 4 | 0.05 | 0.08 | 0.14 | 0.34 | 0.51 | 0.26 | 75% | NA |
| TYLMI | 4 | 0.05 | 0.10 | 0.22 | 0.37 | 0.45 | 0.27 | 75% | NA |
| Storm Event Samples | | | | | | | | | |
| EVALSS | 12 | 0.22 | 0.42 | 0.53 | 0.71 | 1.50 | 0.29 | 100% | NA |
| EVAMS | 12 | 0.30 | 0.45 | 0.55 | 0.65 | 1.20 | 0.20 | 100% | NA |
| MONM | 12 | 0.21 | 0.42 | 0.55 | 0.66 | 0.90 | 0.25 | 100% | NA |
| MONMN | 12 | 0.21 | 0.35 | 0.50 | 0.68 | 1.10 | 0.33 | 100% | NA |
| MONMS | 12 | 0.14 | 0.37 | 0.47 | 0.53 | 0.71 | 0.16 | 100% | NA |
| TOSMO | 12 | 0.38 | 0.59 | 0.69 | 0.84 | 1.40 | 0.25 | 100% | NA |
| TOSMI | 12 | 0.36 | 0.62 | 0.76 | 0.86 | 1.50 | 0.24 | 100% | NA |
| COLM | 12 | 0.23 | 0.42 | 0.57 | 0.75 | 2.60 | 0.33 | 100% | NA |
| SEIMN | 12 | 0.19 | 0.42 | 0.54 | 0.59 | 1.10 | 0.17 | 100% | NA |
| SEIMS | 12 | 0.39 | 0.52 | 0.58 | 0.88 | 1.00 | 0.37 | 100% | NA |
| COUMO | 12 | 0.37 | 0.47 | 0.59 | 0.79 | 1.10 | 0.32 | 100% | NA |
| COUMI | 12 | 0.16 | 0.45 | 0.65 | 0.93 | 1.90 | 0.48 | 100% | NA |
| TYLMO | 12 | 0.26 | 0.43 | 0.51 | 0.72 | 1.40 | 0.29 | 100% | NA |
| TYLMI | 12 | 0.26 | 0.48 | 0.59 | 0.70 | 0.97 | 0.22 | 100% | NA |

mg/L: milligrams per liter

All summary statistics were calculated using values of half the reporting limit for non-detect values.

Table H-10. Summary Statistics for Dissolved Copper Concentrations Measured in Storm Event and Base Flow Samples.

| Station | n | Minimum (ug/L) | 25th Percentile (ug/L) | Median (ug/L) | 75th Percentile (ug/L) | Maximum (ug/L) | Interquartile Range (ug/L) | Percent Detected | Percent Exceeding Standard ^a |
|----------------------------|----|-------------------|---------------------------|------------------|---------------------------|-------------------|-------------------------------|---------------------|---|
| Base Flow Samples | | | | | | | | | |
| EVALSS | 4 | 0.5 | 0.5 | 0.5 | 0.5 | 0.5 | 0.0 | 0% | 0% |
| EVAMS | 4 | 0.5 | 0.5 | 0.5 | 0.5 | 0.5 | 0.0 | 0% | 0% |
| MONNM | 4 | 0.5 | 0.5 | 0.5 | 0.5 | 0.5 | 0.0 | 0% | 0% |
| MONMN | 4 | 0.5 | 0.5 | 0.5 | 0.5 | 0.5 | 0.0 | 0% | 0% |
| MONMS | 4 | 0.5 | 0.5 | 0.5 | 0.5 | 0.5 | 0.0 | 0% | 0% |
| TOSMO | 4 | 0.5 | 0.5 | 0.5 | 0.5 | 0.5 | 0.0 | 0% | 0% |
| TOSMI | 4 | 0.5 | 0.5 | 0.9 | 1.4 | 1.5 | 0.9 | 50% | 0% |
| COLM | 5 | 0.5 | 0.5 | 0.5 | 0.5 | 1.9 | 0.0 | 20% | 20% |
| SEIMN | 4 | 0.5 | 0.5 | 0.5 | 0.5 | 0.5 | 0.0 | 0% | 0% |
| SEIMS | 4 | 0.5 | 0.5 | 0.5 | 0.5 | 0.5 | 0.0 | 0% | 0% |
| COUMO | 4 | 0.5 | 0.5 | 0.5 | 0.5 | 0.5 | 0.0 | 0% | 0% |
| COUMI | 4 | 0.5 | 0.5 | 0.5 | 0.5 | 0.5 | 0.0 | 0% | 0% |
| TYLMO | 4 | 0.5 | 0.5 | 0.8 | 1.1 | 1.1 | 0.6 | 50% | 0% |
| TYLMI | 4 | 0.5 | 0.5 | 1.0 | 2.0 | 2.6 | 1.5 | 50% | 0% |
| Storm Event Samples | | | | | | | | | |
| EVALSS | 12 | 0.5 | 0.5 | 0.5 | 1.4 | 5.6 | 0.9 | 33% | 0% |
| EVAMS | 12 | 0.5 | 0.5 | 0.5 | 0.5 | 1.3 | 0.0 | 8% | 0% |
| MONNM | 12 | 0.5 | 0.8 | 1.1 | 1.4 | 1.7 | 0.6 | 75% | 0% |
| MONMN | 12 | 0.5 | 0.5 | 1.1 | 1.5 | 8.8 | 1.0 | 58% | 8% |
| MONMS | 12 | 0.5 | 1.5 | 1.7 | 1.9 | 2.3 | 0.4 | 92% | 0% |
| TOSMO | 12 | 2.3 | 2.6 | 2.9 | 3.2 | 3.9 | 0.6 | 100% | 0% |
| TOSMI | 12 | 2.7 | 3.3 | 4.3 | 4.7 | 6.4 | 1.4 | 100% | 0% |
| COLM | 12 | 0.5 | 0.5 | 0.5 | 0.5 | 11.0 | 0.0 | 17% | 8% |
| SEIMN | 12 | 0.5 | 0.5 | 0.5 | 0.5 | 1.3 | 0.0 | 17% | 0% |
| SEIMS | 12 | 0.5 | 0.5 | 0.5 | 0.5 | 23.0 | 0.0 | 17% | 8% |
| COUMO | 12 | 1.5 | 2.0 | 2.3 | 2.9 | 3.3 | 0.9 | 100% | 0% |
| COUMI | 12 | 1.1 | 1.3 | 1.5 | 2.2 | 4.1 | 0.9 | 100% | 0% |
| TYLMO | 12 | 1.7 | 2.0 | 2.4 | 3.1 | 4.4 | 1.1 | 100% | 0% |
| TYLMI | 12 | 1.2 | 2.4 | 2.5 | 4.1 | 14.0 | 1.7 | 100% | 8% |

µg/L: micrograms per liter

All summary statistics were calculated using values of half the reporting limit for non-detect values.

^a Percentage of base flow and storm event samples exceeding acute and chronic freshwater aquatic life protection criteria, respectively, for dissolved copper from Ecology (2016). Criterion were derived using measured hardness at each station (see Table H-3).

Table H-11. Summary Statistics for Total Copper Concentrations Measured in Storm Event and Base Flow Samples.

| Station | n | Minimum (ug/L) | 25th Percentile (ug/L) | Median (ug/L) | 75th Percentile (ug/L) | Maximum (ug/L) | Interquartile Range (ug/L) | Percent Detected | Percent Exceeding Standard |
|----------------------------|----|-------------------|---------------------------|------------------|---------------------------|-------------------|-------------------------------|---------------------|----------------------------------|
| Base Flow Samples | | | | | | | | | |
| EVALSS | 4 | 0.5 | 0.5 | 0.5 | 0.5 | 0.5 | 0.0 | 0% | NA |
| EVAMS | 4 | 0.5 | 0.5 | 0.5 | 0.5 | 0.5 | 0.0 | 0% | NA |
| MONM | 4 | 0.5 | 0.5 | 0.5 | 0.5 | 0.5 | 0.0 | 0% | NA |
| MONMN | 4 | 0.5 | 0.5 | 0.5 | 0.5 | 0.5 | 0.0 | 0% | NA |
| MONMS | 4 | 0.5 | 0.5 | 0.5 | 0.8 | 1.1 | 0.3 | 25% | NA |
| TOSMO | 4 | 0.5 | 0.5 | 0.8 | 1.0 | 1.0 | 0.5 | 50% | NA |
| TOSMI | 4 | 0.5 | 0.9 | 1.4 | 1.7 | 1.9 | 0.8 | 75% | NA |
| COLM | 5 | 0.5 | 0.5 | 0.5 | 0.5 | 1.2 | 0.0 | 20% | NA |
| SEIMN | 4 | 0.5 | 0.5 | 0.5 | 1.1 | 1.7 | 0.6 | 25% | NA |
| SEIMS | 4 | 0.5 | 0.5 | 0.5 | 0.5 | 0.5 | 0.0 | 0% | NA |
| COUMO | 4 | 0.5 | 0.5 | 0.5 | 0.5 | 0.5 | 0.0 | 0% | NA |
| COUMI | 4 | 0.5 | 0.5 | 0.5 | 0.8 | 1.1 | 0.3 | 25% | NA |
| TYLMO | 4 | 0.5 | 0.9 | 1.4 | 1.8 | 2.1 | 0.9 | 75% | NA |
| TYLMI | 4 | 1.5 | 1.8 | 2.1 | 2.1 | 2.1 | 0.3 | 100% | NA |
| Storm Event Samples | | | | | | | | | |
| EVALSS | 12 | 0.5 | 0.5 | 0.5 | 1.3 | 5.2 | 0.8 | 33% | NA |
| EVAMS | 12 | 0.5 | 0.5 | 0.5 | 0.9 | 3.7 | 0.4 | 25% | NA |
| MONM | 12 | 0.5 | 1.6 | 2.2 | 2.8 | 3.0 | 1.2 | 92% | NA |
| MONMN | 12 | 0.5 | 1.3 | 1.7 | 2.3 | 3.8 | 1.1 | 92% | NA |
| MONMS | 12 | 0.5 | 1.7 | 2.2 | 2.6 | 3.1 | 0.9 | 92% | NA |
| TOSMO | 12 | 4.2 | 4.8 | 8.1 | 10.5 | 14.0 | 5.7 | 100% | NA |
| TOSMI | 12 | 4.1 | 8.1 | 9.5 | 14.5 | 17.0 | 6.4 | 100% | NA |
| COLM | 12 | 0.5 | 0.5 | 0.5 | 0.5 | 1.4 | 0.0 | 8% | NA |
| SEIMN | 12 | 0.5 | 0.5 | 1.3 | 2.3 | 6.1 | 1.8 | 67% | NA |
| SEIMS | 12 | 0.5 | 0.5 | 1.1 | 1.7 | 3.1 | 1.2 | 58% | NA |
| COUMO | 12 | 2.3 | 4.0 | 4.8 | 5.5 | 9.3 | 1.5 | 100% | NA |
| COUMI | 12 | 1.7 | 2.6 | 3.7 | 5.5 | 8.8 | 2.9 | 100% | NA |
| TYLMO | 12 | 3.2 | 3.6 | 5.6 | 7.5 | 11.0 | 3.9 | 100% | NA |
| TYLMI | 12 | 1.8 | 2.9 | 3.5 | 4.5 | 11.0 | 1.6 | 100% | NA |

µg/L: micrograms per liter

All summary statistics were calculated using values of half the reporting limit for non-detect values.

Table H-12. Summary Statistics for Dissolved Zinc Concentrations Measured in Storm Event and Base Flow Samples.

| Station | n | Minimum (ug/L) | 25th Percentile (ug/L) | Median (ug/L) | 75th Percentile (ug/L) | Maximum (ug/L) | Interquartile Range (ug/L) | Percent Detected | Percent Exceeding Standard ^a |
|----------------------------|----|-------------------|---------------------------|------------------|---------------------------|-------------------|-------------------------------|---------------------|---|
| Base Flow Samples | | | | | | | | | |
| IVALSS | 4 | 2.5 | 2.5 | 2.5 | 2.5 | 2.5 | 0.0 | 0% | 0% |
| EVAMS | 4 | 2.5 | 2.5 | 2.5 | 2.5 | 2.5 | 0.0 | 0% | 0% |
| MONM | 4 | 2.5 | 2.5 | 4.0 | 6.2 | 6.9 | 3.7 | 50% | 0% |
| MONMN | 4 | 2.5 | 2.5 | 2.5 | 2.5 | 2.5 | 0.0 | 0% | 0% |
| MONMS | 4 | 2.5 | 2.5 | 2.5 | 2.5 | 2.5 | 0.0 | 0% | 0% |
| TOSMO | 4 | 2.5 | 2.5 | 4.9 | 10.7 | 14.0 | 8.2 | 50% | 0% |
| TOSMI | 4 | 6.2 | 7.0 | 13.9 | 22.0 | 24.0 | 15.0 | 100% | 0% |
| COLM | 5 | 2.5 | 2.5 | 2.5 | 2.5 | 2.5 | 0.0 | 0% | 0% |
| SEIMN | 4 | 2.5 | 2.5 | 2.5 | 2.5 | 2.5 | 0.0 | 0% | 0% |
| SEIMS | 4 | 2.5 | 2.5 | 2.5 | 2.5 | 2.5 | 0.0 | 0% | 0% |
| COUMO | 4 | 2.5 | 2.5 | 2.5 | 2.5 | 2.5 | 0.0 | 0% | 0% |
| COUMI | 4 | 2.5 | 2.5 | 2.5 | 2.5 | 2.5 | 0.0 | 0% | 0% |
| TYLMO | 4 | 2.5 | 2.5 | 4.5 | 6.7 | 6.8 | 4.2 | 50% | 0% |
| TYLMI | 4 | 2.5 | 2.5 | 2.5 | 4.2 | 5.8 | 1.7 | 25% | 0% |
| Storm Event Samples | | | | | | | | | |
| IVALSS | 12 | 2.5 | 2.5 | 2.5 | 3.9 | 8.2 | 1.4 | 25% | 0% |
| EVAMS | 12 | 2.5 | 2.5 | 2.5 | 2.5 | 2.5 | 0.0 | 0% | 0% |
| MONM | 12 | 5.7 | 6.3 | 6.6 | 7.2 | 11.0 | 0.9 | 100% | 0% |
| MONMN | 12 | 2.5 | 2.5 | 4.0 | 6.2 | 9.4 | 3.7 | 50% | 0% |
| MONMS | 12 | 2.5 | 2.5 | 2.5 | 2.5 | 5.3 | 0.0 | 8% | 0% |
| TOSMO | 12 | 7.4 | 11.0 | 16.0 | 18.0 | 110.0 | 7.0 | 100% | 8% |
| TOSMI | 12 | 17.0 | 21.0 | 24.5 | 27.0 | 35.0 | 6.0 | 100% | 0% |
| COLM | 12 | 2.5 | 2.5 | 2.5 | 2.5 | 9.1 | 0.0 | 8% | 0% |
| SEIMN | 12 | 2.5 | 2.5 | 2.5 | 2.5 | 2.5 | 0.0 | 0% | 0% |
| SEIMS | 12 | 2.5 | 2.5 | 2.5 | 2.5 | 17.0 | 0.0 | 8% | 0% |
| COUMO | 12 | 8.7 | 9.5 | 11.5 | 19.0 | 52.0 | 9.6 | 100% | 8% |
| COUMI | 12 | 2.5 | 2.5 | 2.5 | 9.8 | 20.0 | 7.3 | 42% | 0% |
| TYLMO | 12 | 2.5 | 2.5 | 5.6 | 7.3 | 10.0 | 4.8 | 67% | 0% |
| TYLMI | 12 | 2.5 | 7.0 | 9.1 | 12.0 | 240.0 | 5.1 | 92% | 8% |

µg/L: micrograms per liter

All summary statistics were calculated using values of half the reporting limit for non-detect values.

^a Percentage of base flow and storm event samples exceeding acute and chronic freshwater aquatic life protection criteria, respectively, for dissolved zinc from Ecology (2016). Criteria were derived using measured hardness at each station (see Table H-3).

Table H-13. Summary Statistics for Total Zinc Concentrations Measured in Storm Event and Base Flow Samples.

| Station | n | Minimum (ug/L) | 25th Percentile (ug/L) | Median (ug/L) | 75th Percentile (ug/L) | Maximum (ug/L) | Interquartile Range (ug/L) | Percent Detected | Percent Exceeding Standard |
|----------------------------|----|-------------------|---------------------------|------------------|---------------------------|-------------------|-------------------------------|---------------------|----------------------------------|
| Base Flow Samples | | | | | | | | | |
| EVALSS | 4 | 2.5 | 2.5 | 2.5 | 2.5 | 2.5 | 0.0 | 0% | NA |
| EVAMS | 4 | 2.5 | 2.5 | 2.5 | 2.5 | 2.5 | 0.0 | 0% | NA |
| MONM | 4 | 5.8 | 6.4 | 7.0 | 9.6 | 12.0 | 3.2 | 100% | NA |
| MONMN | 4 | 2.5 | 2.5 | 4.2 | 9.9 | 14.0 | 7.4 | 50% | NA |
| MONMS | 4 | 2.5 | 2.5 | 2.5 | 2.5 | 2.5 | 0.0 | 0% | NA |
| TOSMO | 4 | 2.5 | 2.5 | 6.8 | 13.0 | 15.0 | 10.5 | 50% | NA |
| TOSMI | 4 | 7.5 | 10.8 | 20.5 | 28.0 | 29.0 | 17.3 | 100% | NA |
| COLM | 5 | 2.5 | 2.5 | 2.5 | 2.5 | 6.3 | 0.0 | 20% | NA |
| SEIMN | 4 | 2.5 | 2.5 | 2.5 | 2.5 | 2.5 | 0.0 | 0% | NA |
| SEIMS | 4 | 2.5 | 2.5 | 2.5 | 2.5 | 2.5 | 0.0 | 0% | NA |
| COUMO | 4 | 2.5 | 3.8 | 5.4 | 5.9 | 6.1 | 2.1 | 75% | NA |
| COUMI | 4 | 2.5 | 2.5 | 3.9 | 5.7 | 6.1 | 3.2 | 50% | NA |
| TYLMO | 4 | 2.5 | 4.4 | 8.1 | 11.0 | 12.0 | 6.6 | 75% | NA |
| TYLMI | 4 | 5.3 | 5.5 | 7.0 | 10.7 | 13.0 | 5.2 | 100% | NA |
| Storm Event Samples | | | | | | | | | |
| EVALSS | 12 | 2.5 | 2.5 | 2.5 | 3.8 | 15.0 | 1.3 | 25% | NA |
| EVAMS | 12 | 2.5 | 2.5 | 2.5 | 2.5 | 6.7 | 0.0 | 17% | NA |
| MONM | 12 | 7.5 | 12.5 | 15.0 | 18.5 | 34.0 | 6.0 | 100% | NA |
| MONMN | 12 | 2.5 | 5.3 | 7.8 | 11.5 | 29.0 | 6.2 | 83% | NA |
| MONMS | 12 | 2.5 | 2.5 | 2.5 | 6.4 | 8.6 | 3.9 | 42% | NA |
| TOSMO | 12 | 18.0 | 44.0 | 58.5 | 86.5 | 250.0 | 42.5 | 100% | NA |
| TOSMI | 12 | 38.0 | 51.5 | 65.5 | 125.0 | 210.0 | 73.5 | 100% | NA |
| COLM | 12 | 2.5 | 2.5 | 2.5 | 2.5 | 2.5 | 0.0 | 0% | NA |
| SEIMN | 12 | 2.5 | 2.5 | 2.5 | 2.5 | 10.0 | 0.0 | 17% | NA |
| SEIMS | 12 | 2.5 | 2.5 | 2.5 | 2.5 | 9.6 | 0.0 | 8% | NA |
| COUMO | 12 | 16.0 | 19.0 | 28.5 | 37.5 | 110.0 | 18.5 | 100% | NA |
| COUMI | 12 | 7.3 | 12.0 | 20.5 | 38.0 | 42.0 | 26.0 | 100% | NA |
| TYLMO | 12 | 11.0 | 14.0 | 23.0 | 35.5 | 52.0 | 21.5 | 100% | NA |
| TYLMI | 12 | 5.5 | 10.4 | 13.0 | 23.5 | 300.0 | 13.1 | 100% | NA |

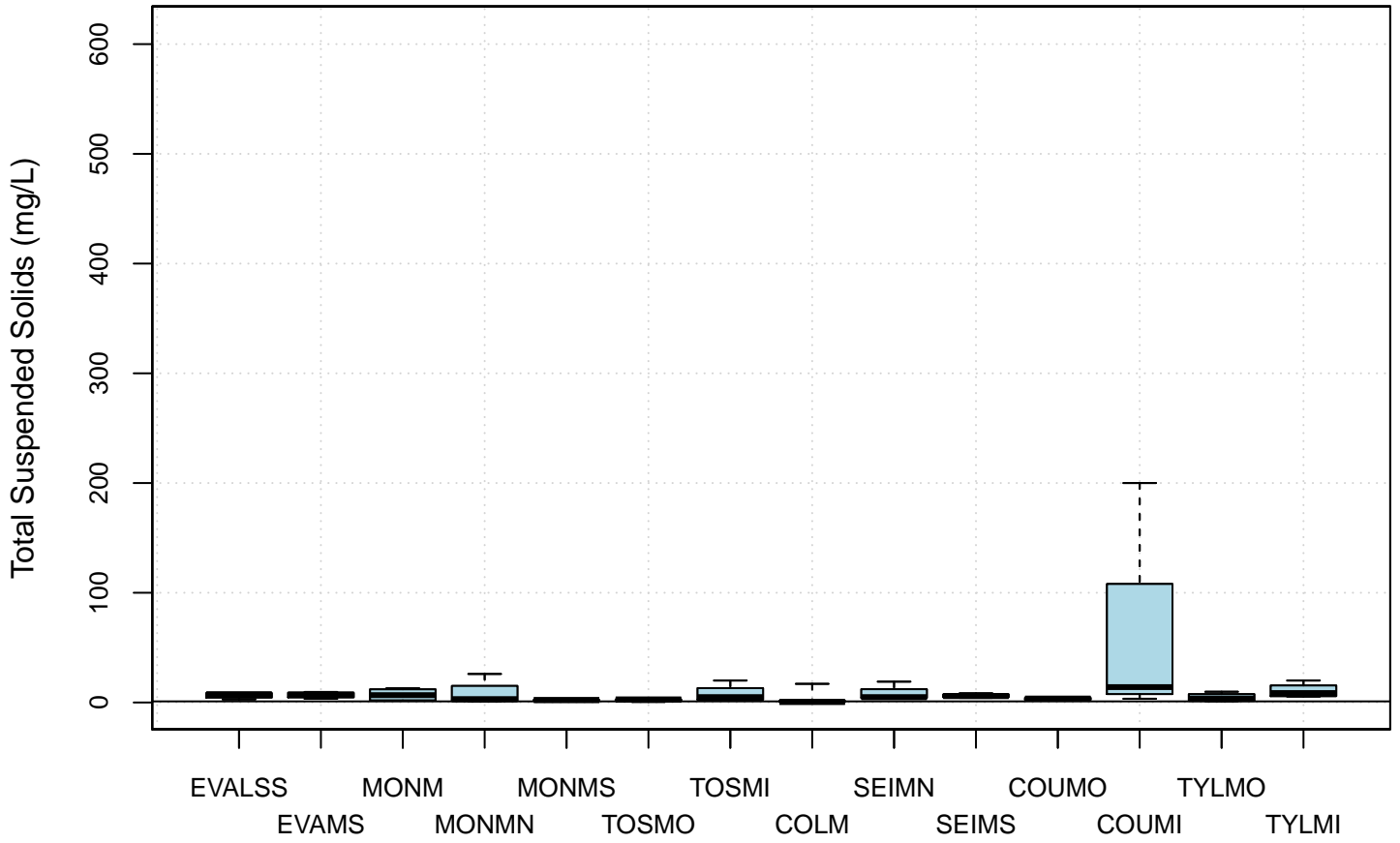
µg/L: micrograms per liter

All summary statistics were calculated using values of half the reporting limit for non-detect values.

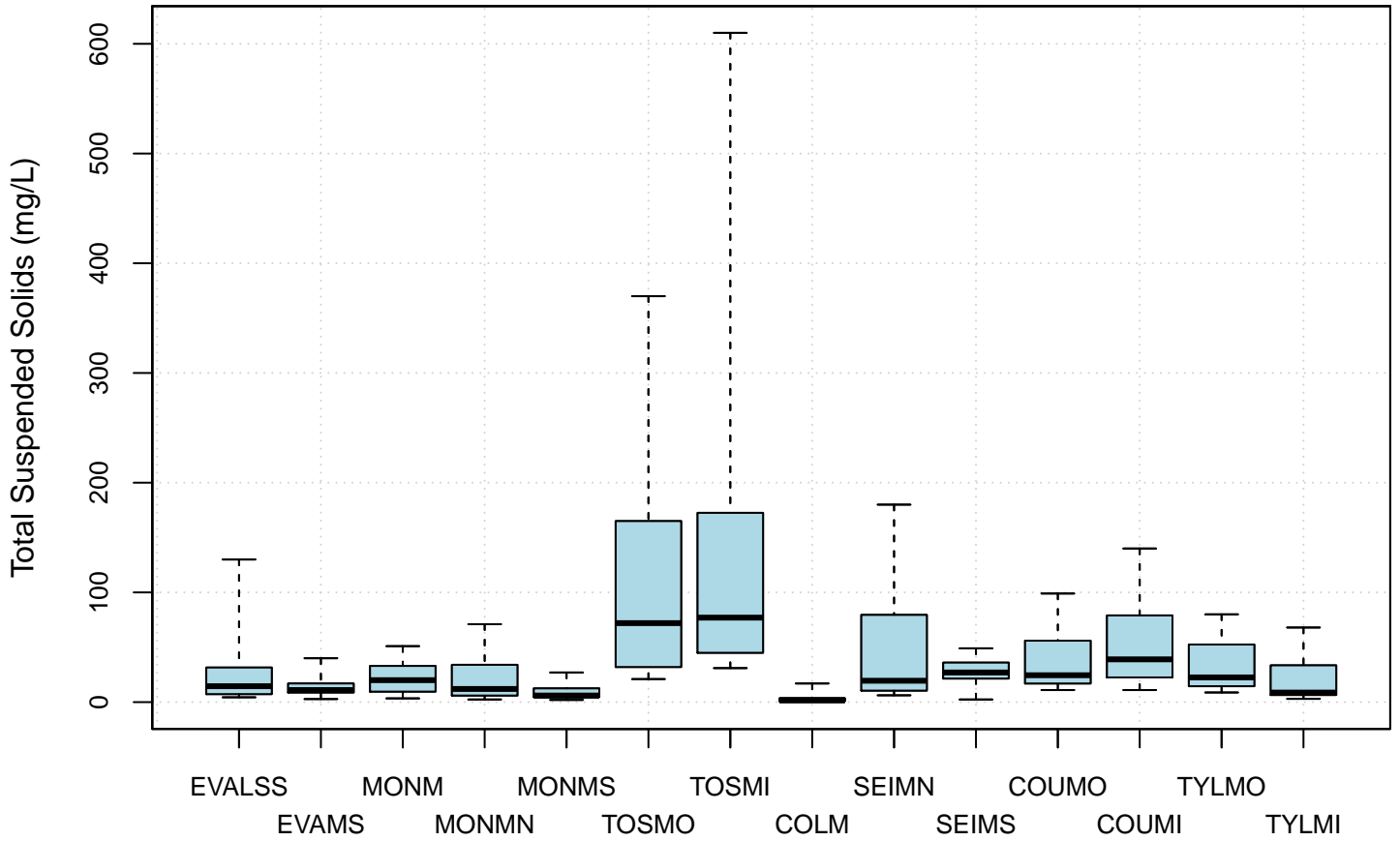
APPENDIX I

Box and Whisker Plots Showing Pollutant Concentrations Measured in Storm Event and Base Flow Samples

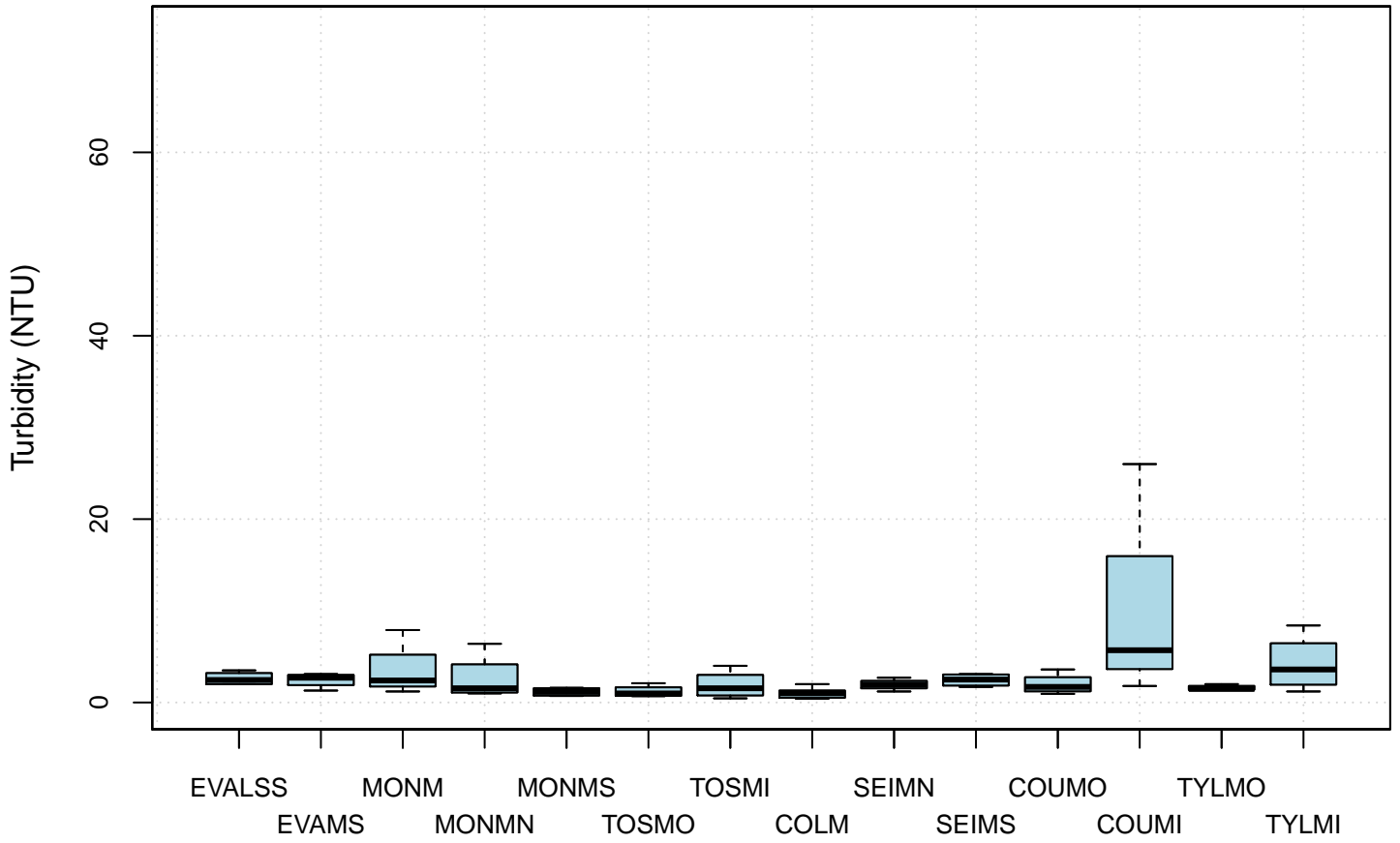
Base Flow



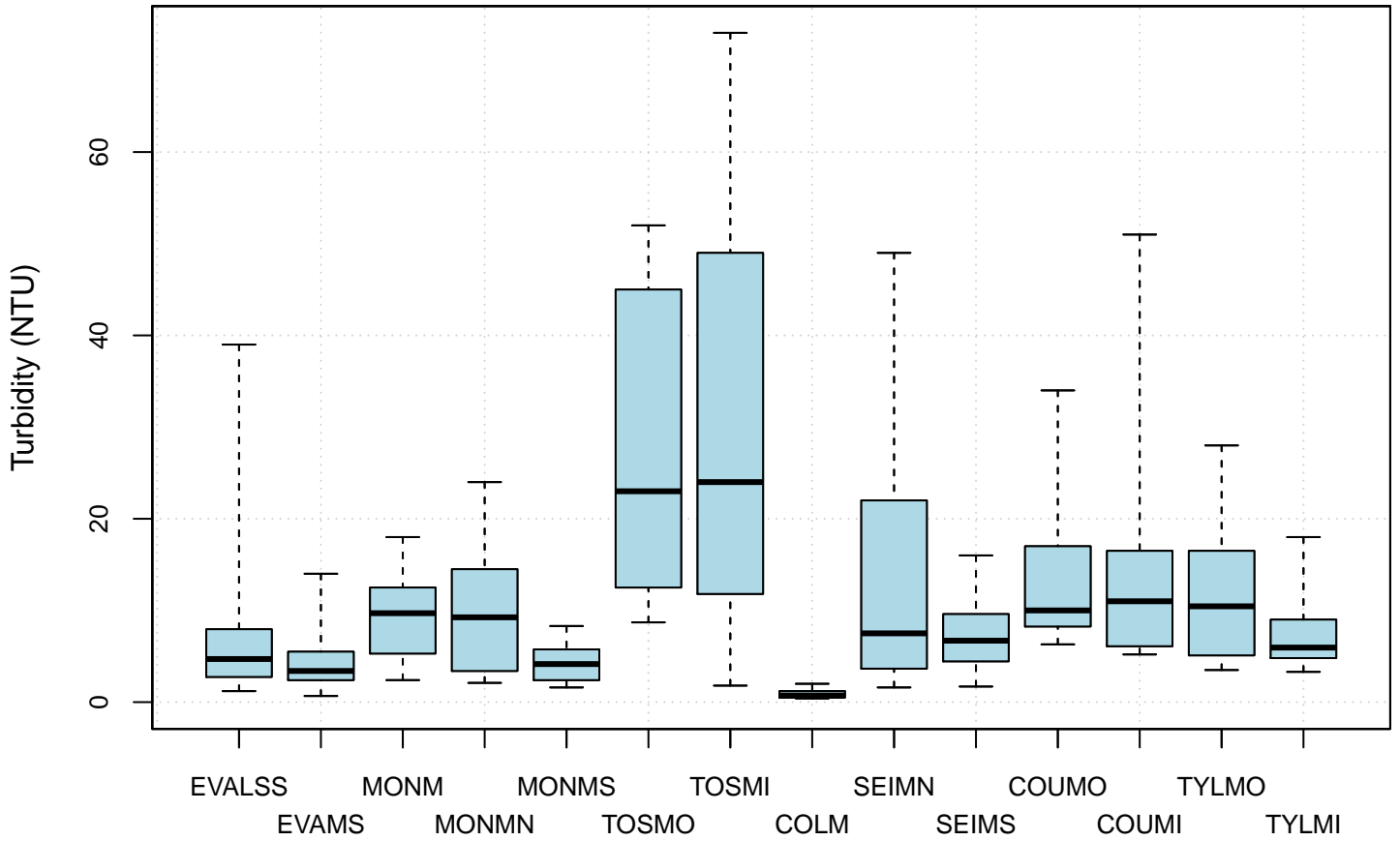
Storm Events



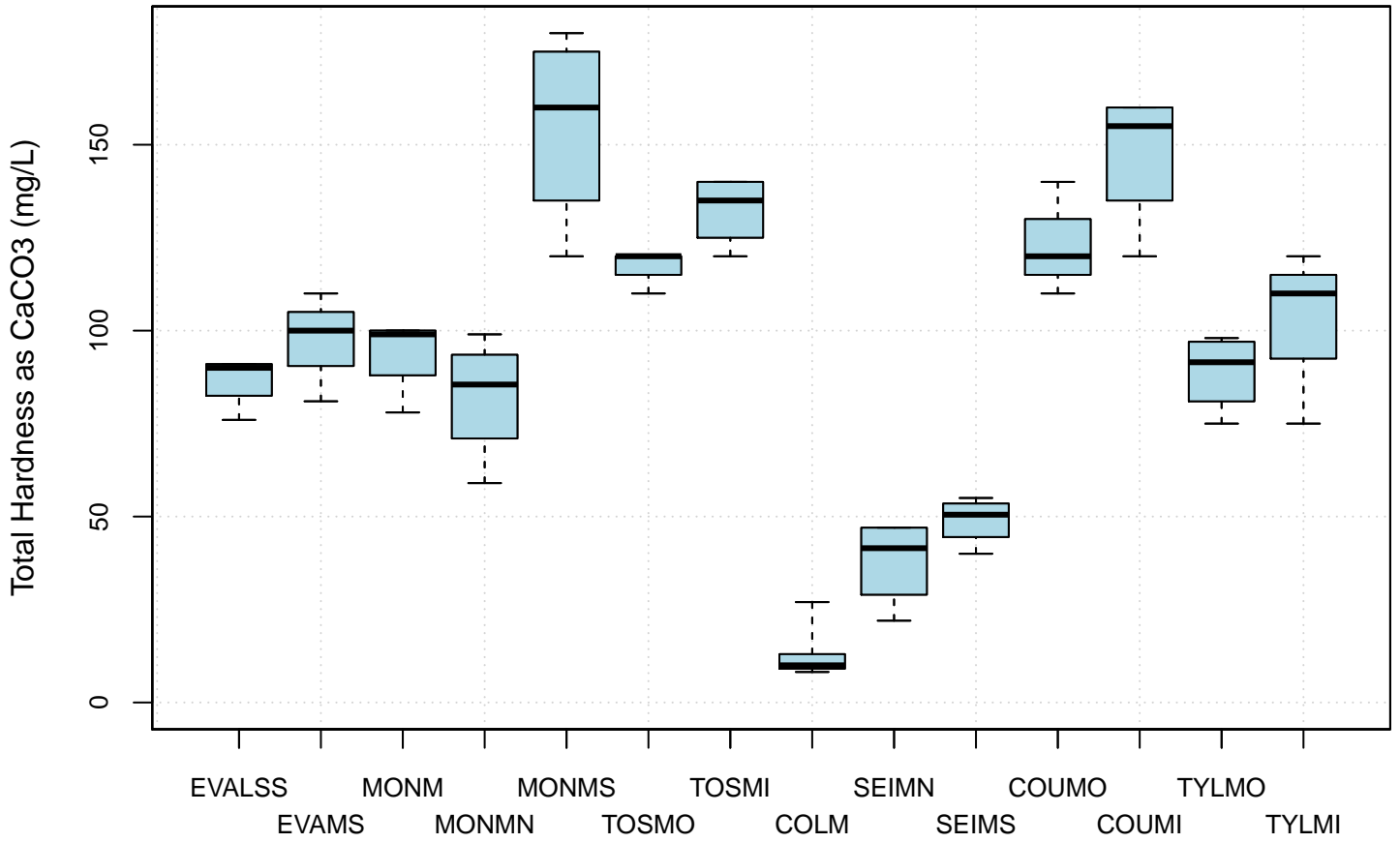
Base Flow



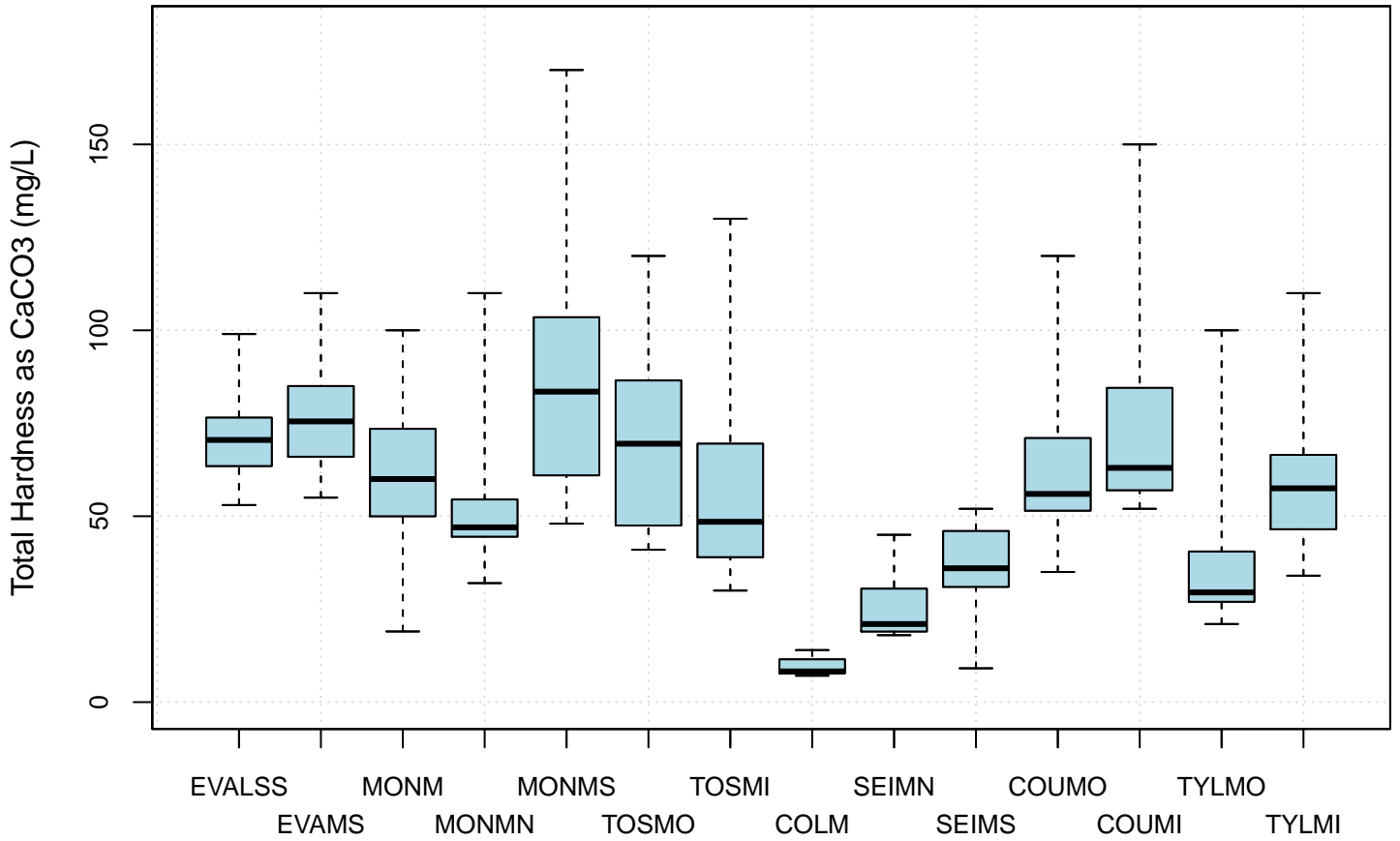
Storm Events



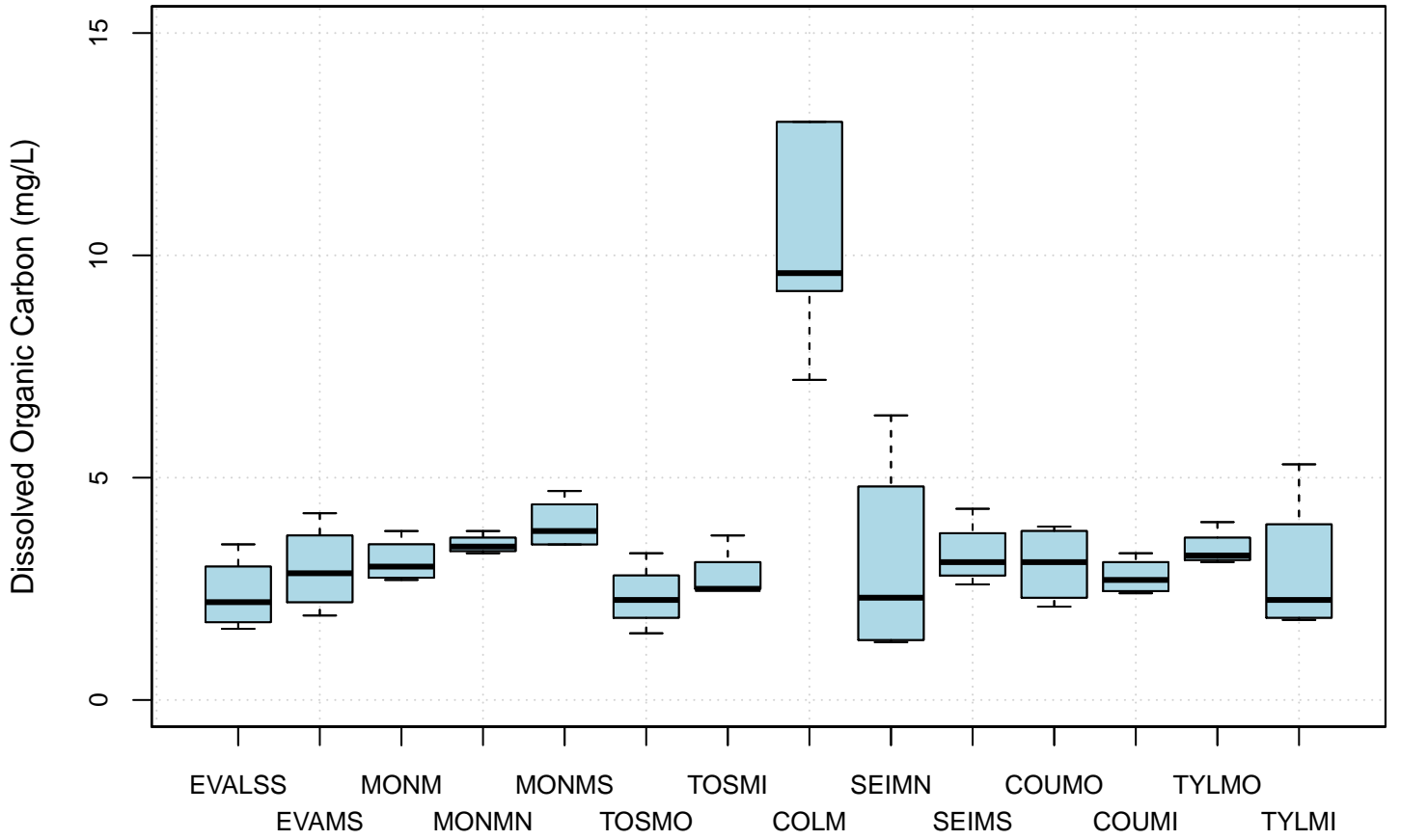
Base Flow



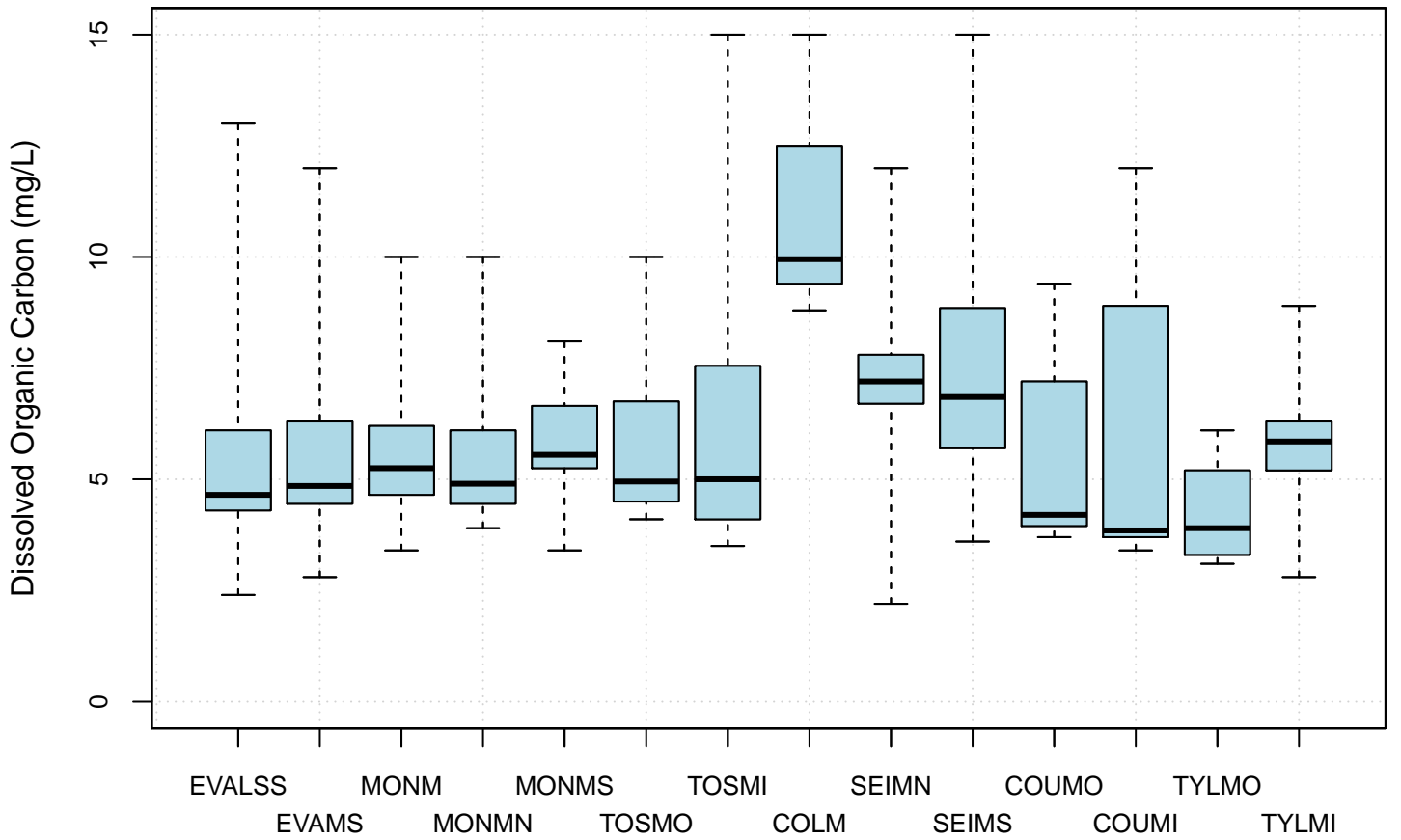
Storm Events



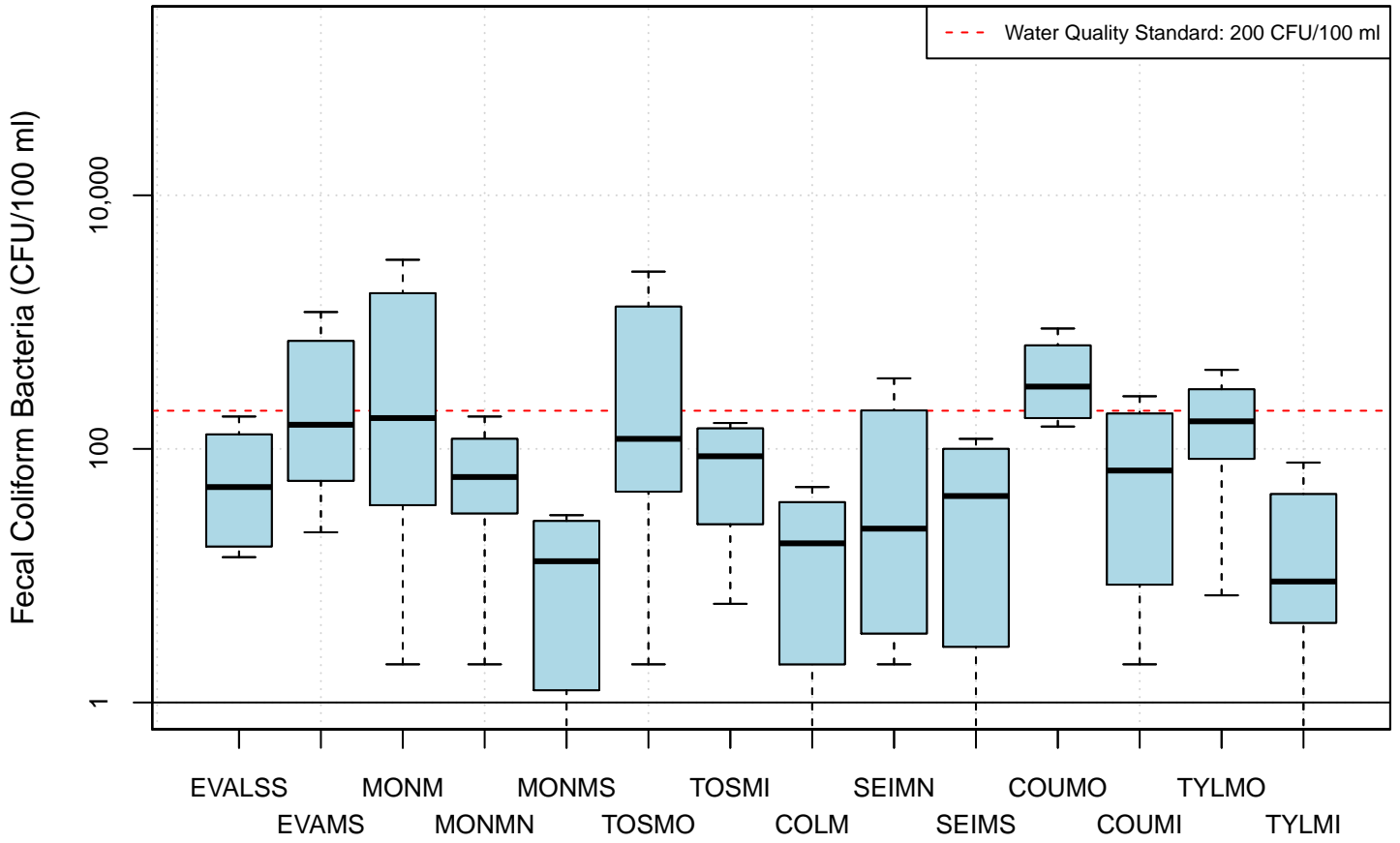
Base Flow



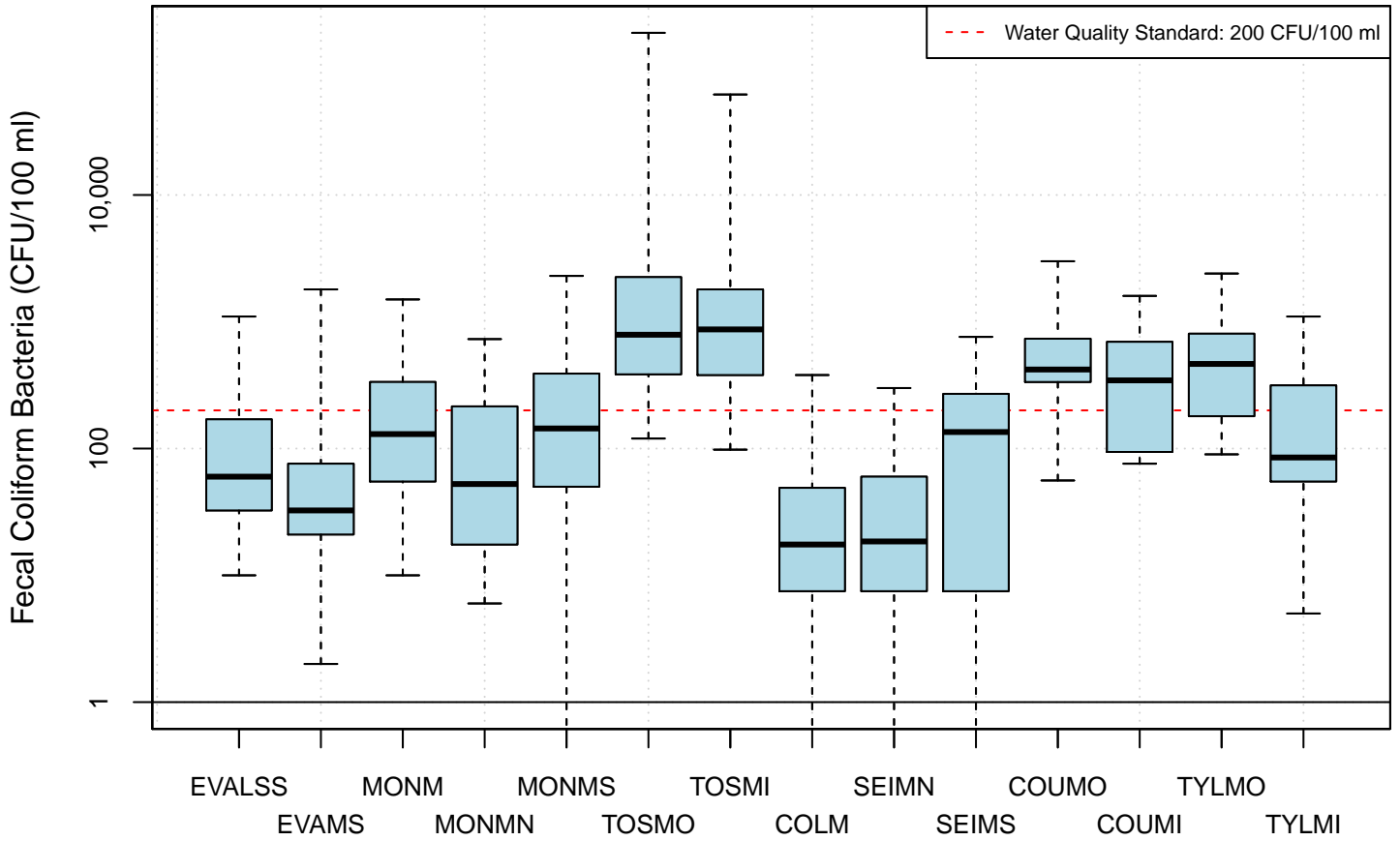
Storm Events



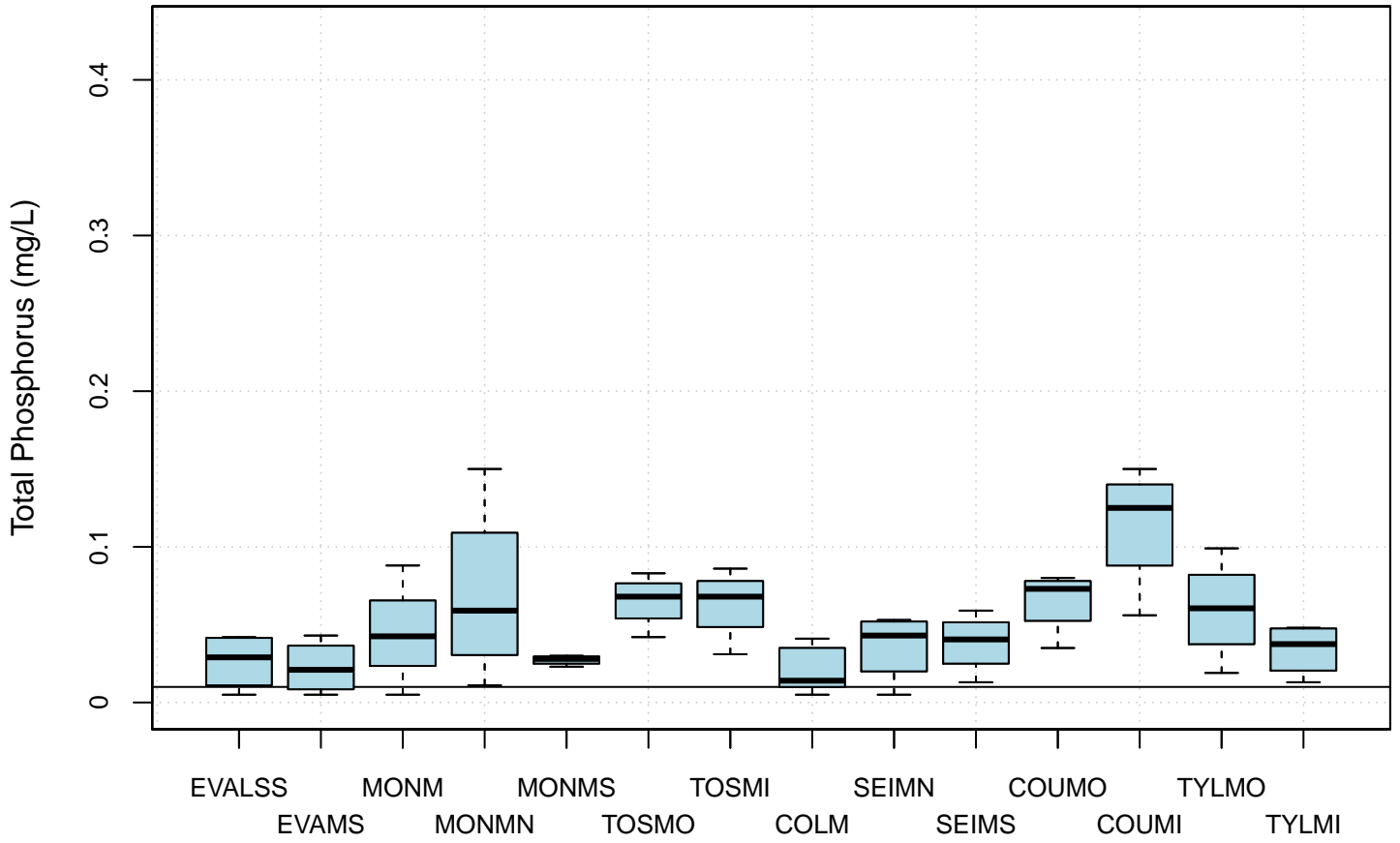
Base Flow



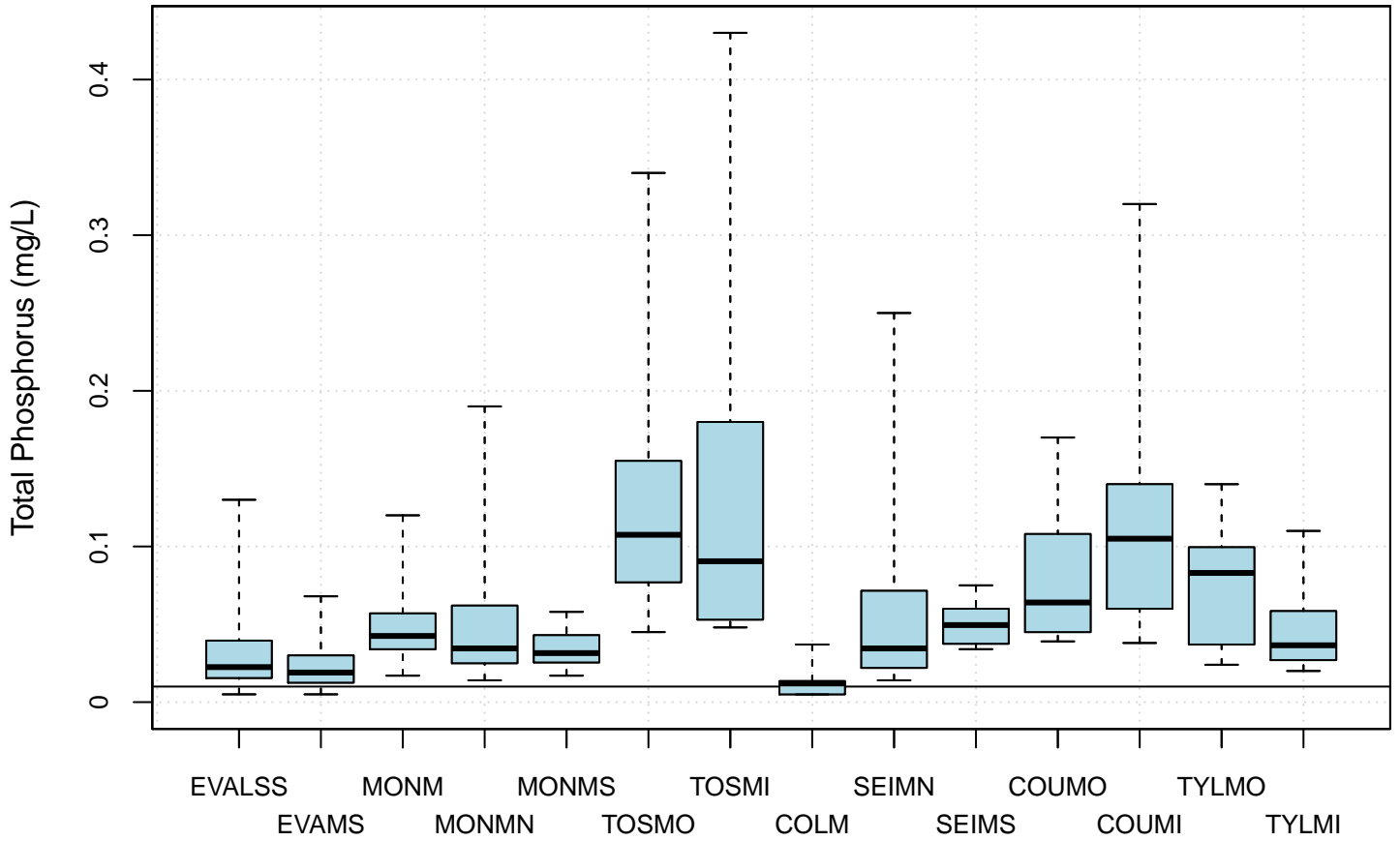
Storm Events



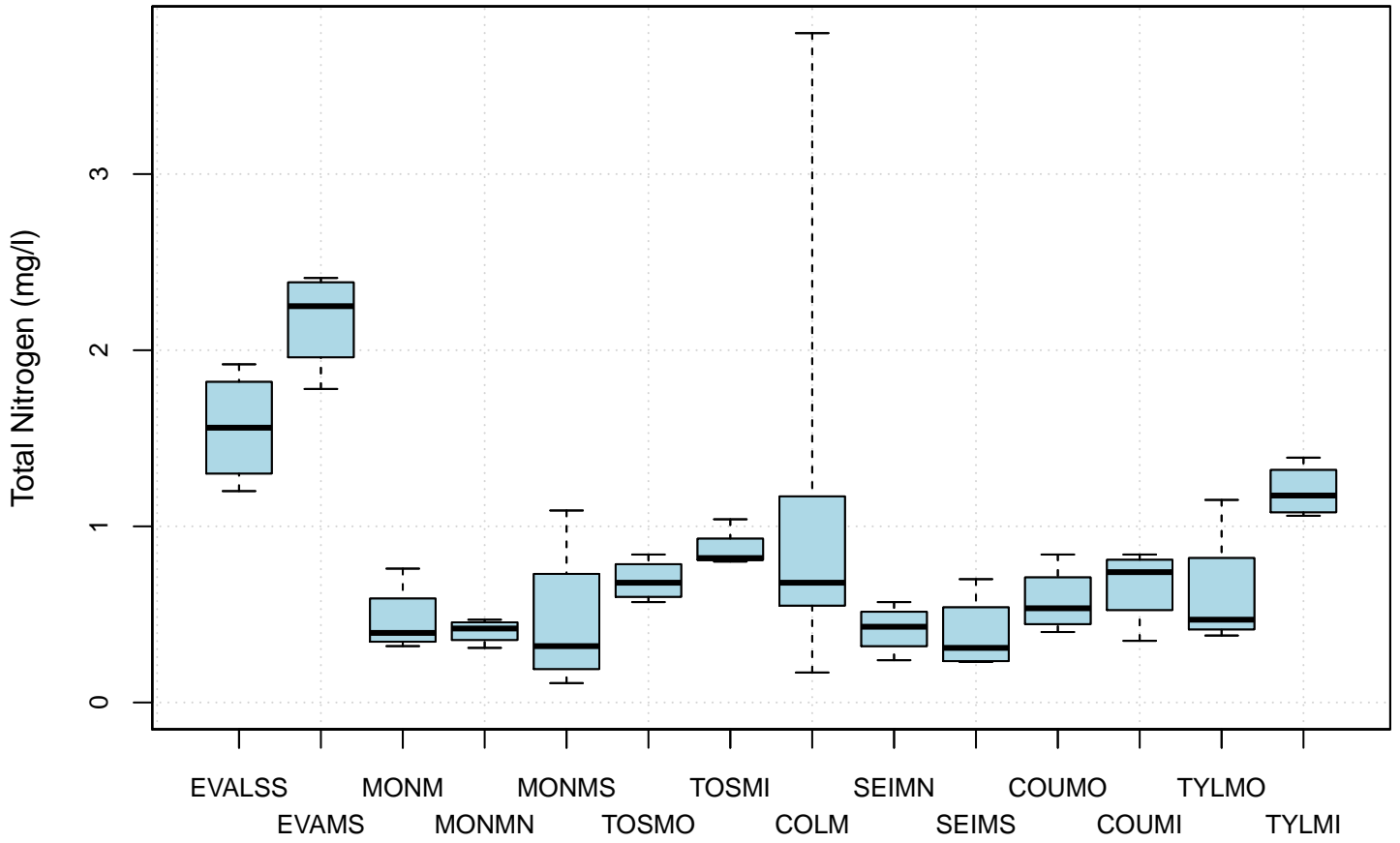
Base Flow



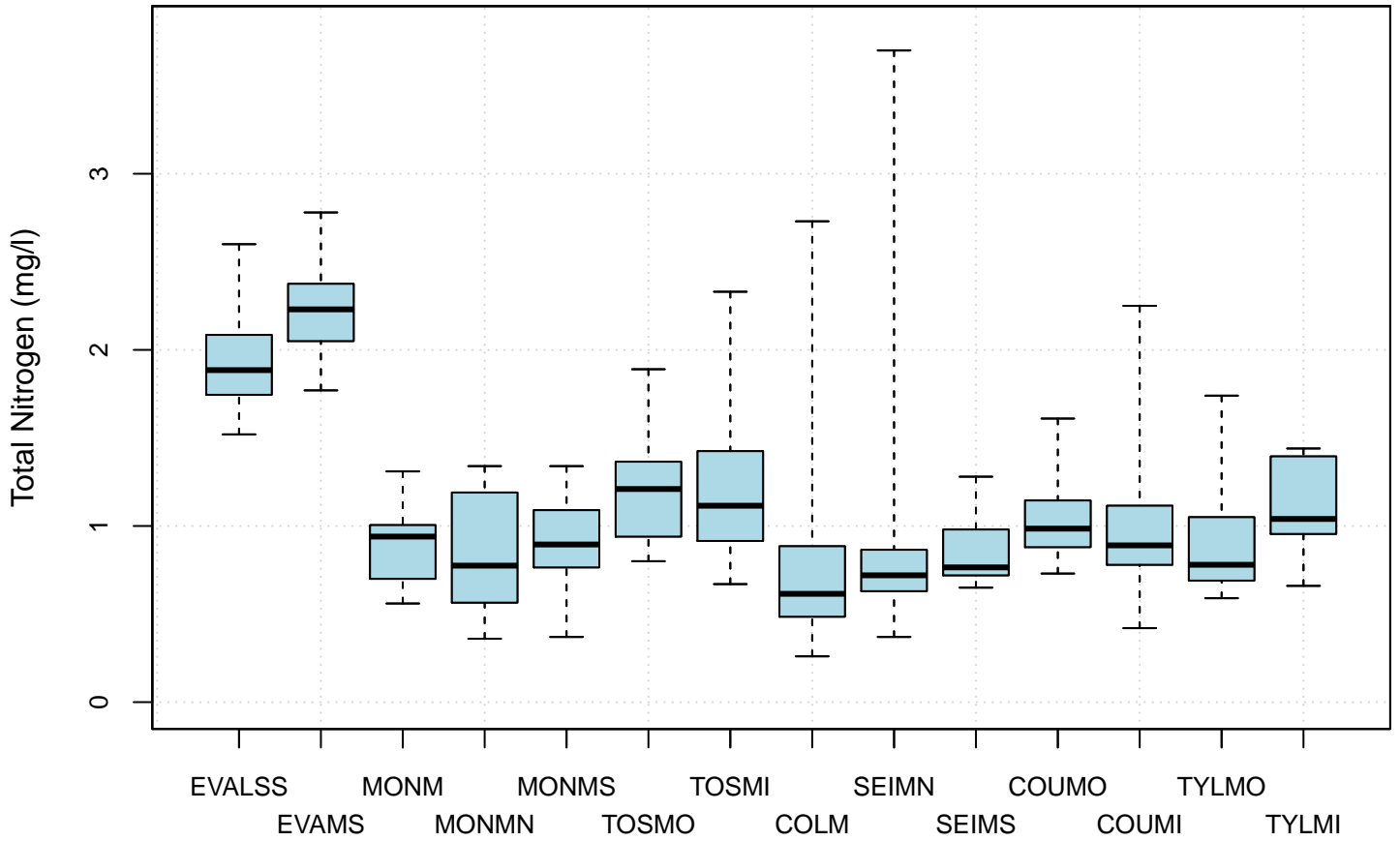
Storm Events



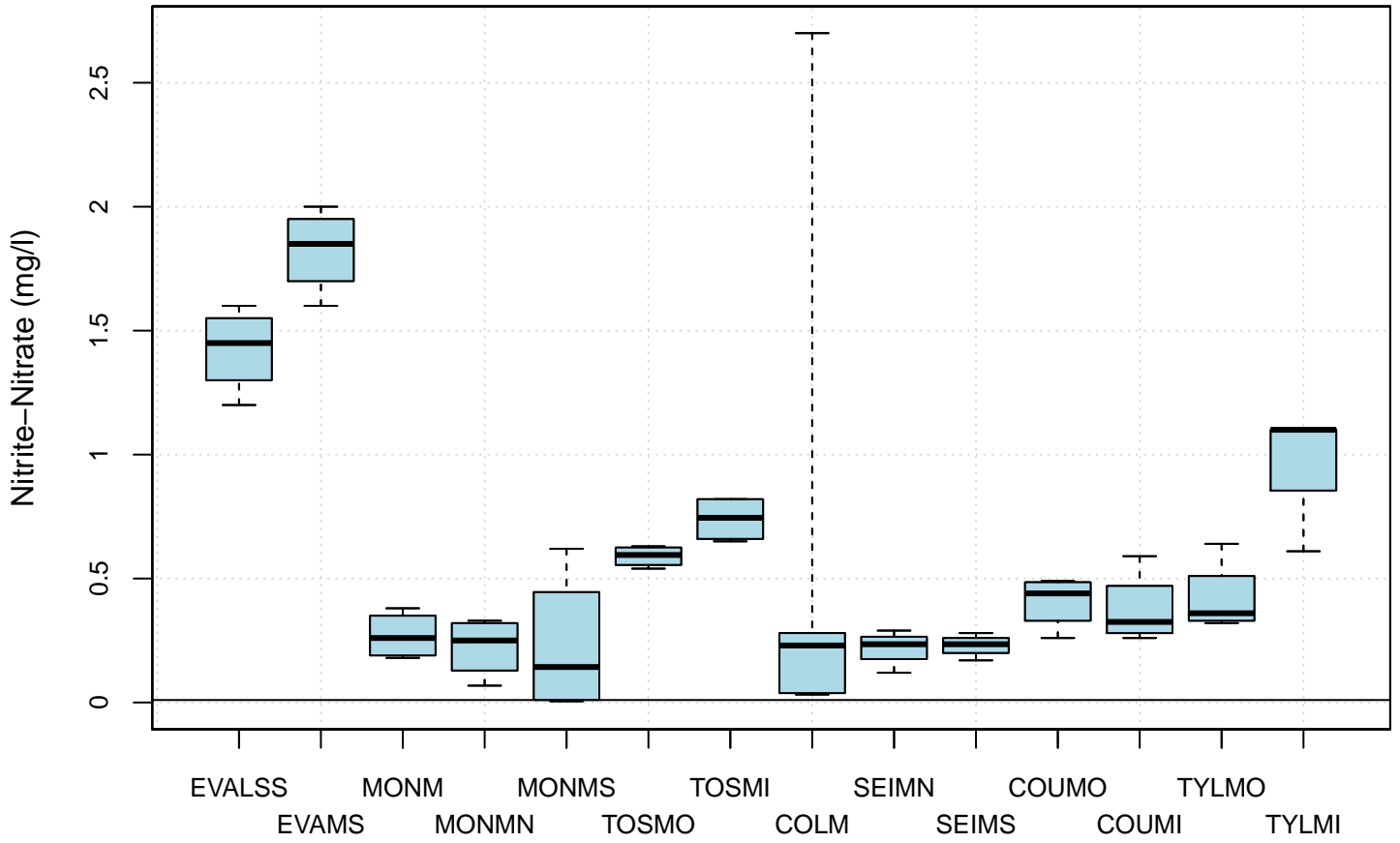
Base Flow



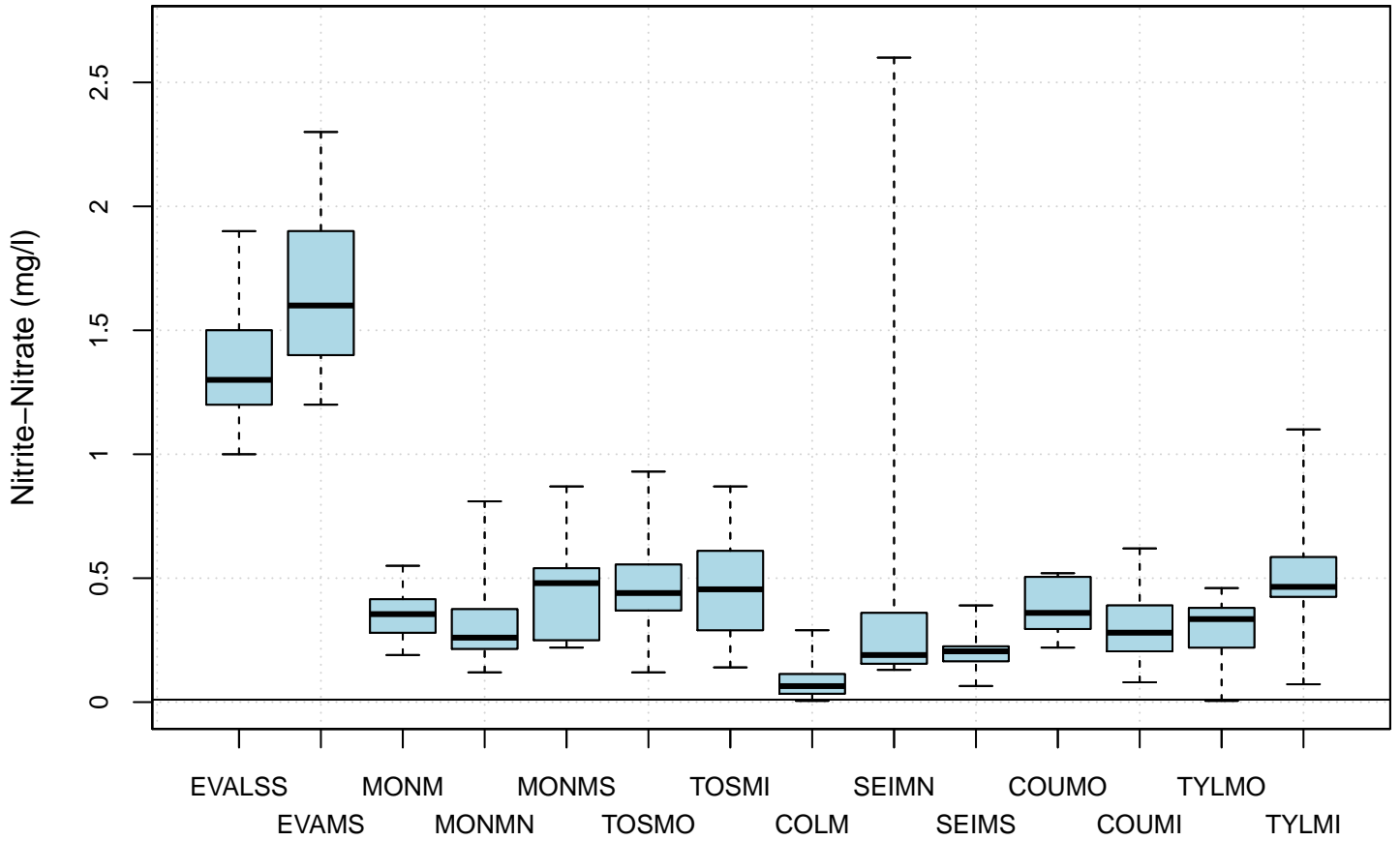
Storm Events



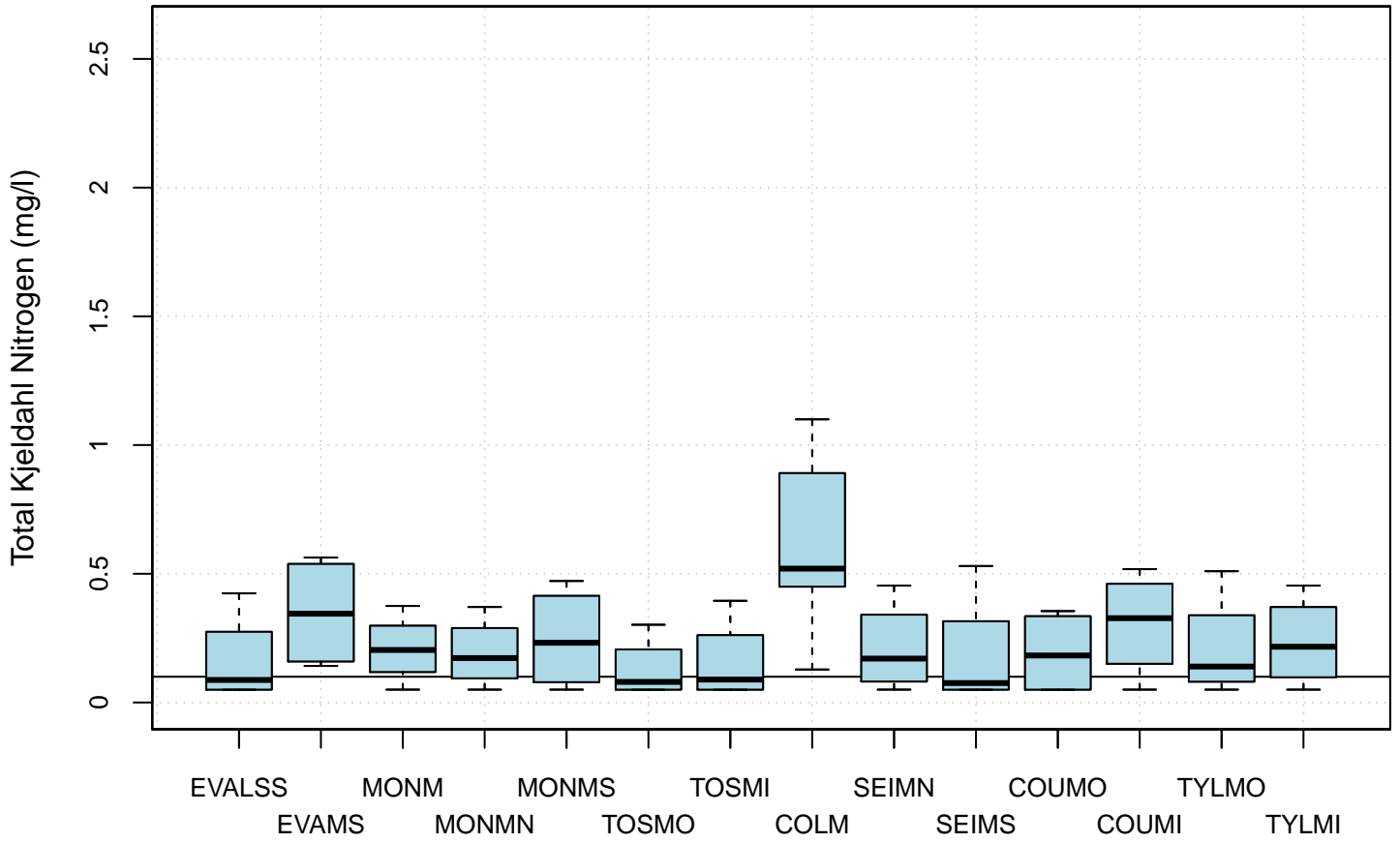
Base Flow



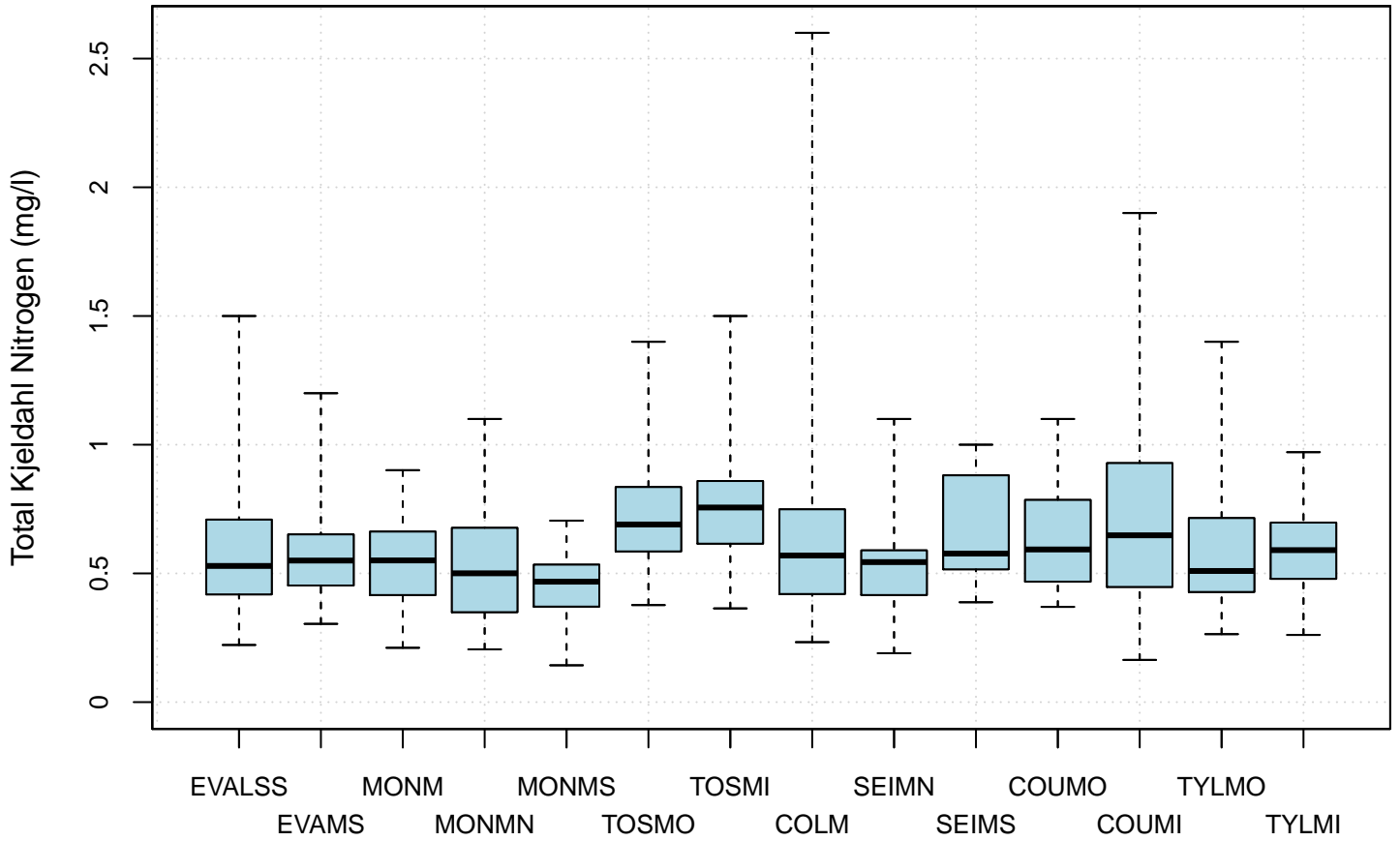
Storm Events



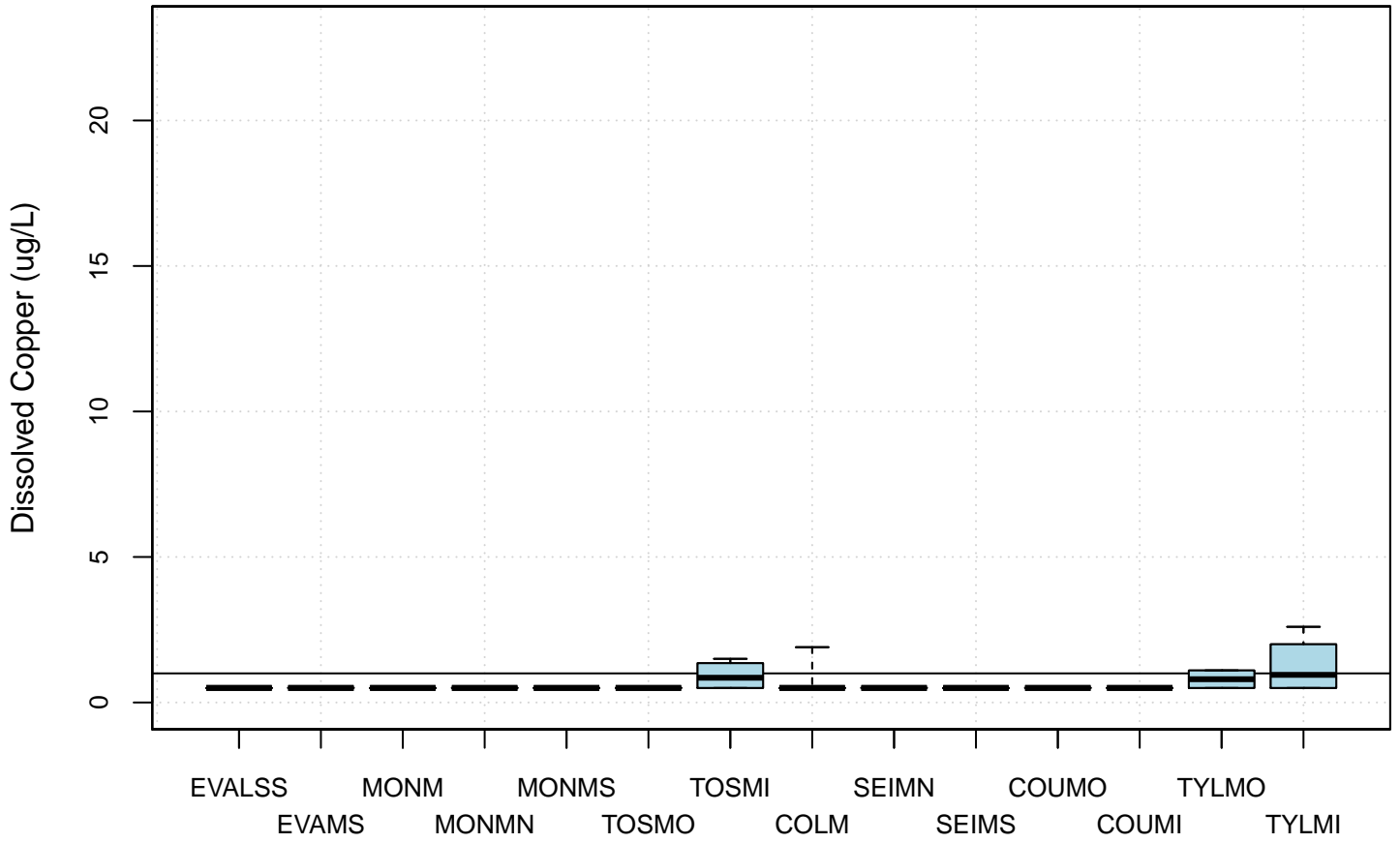
Base Flow



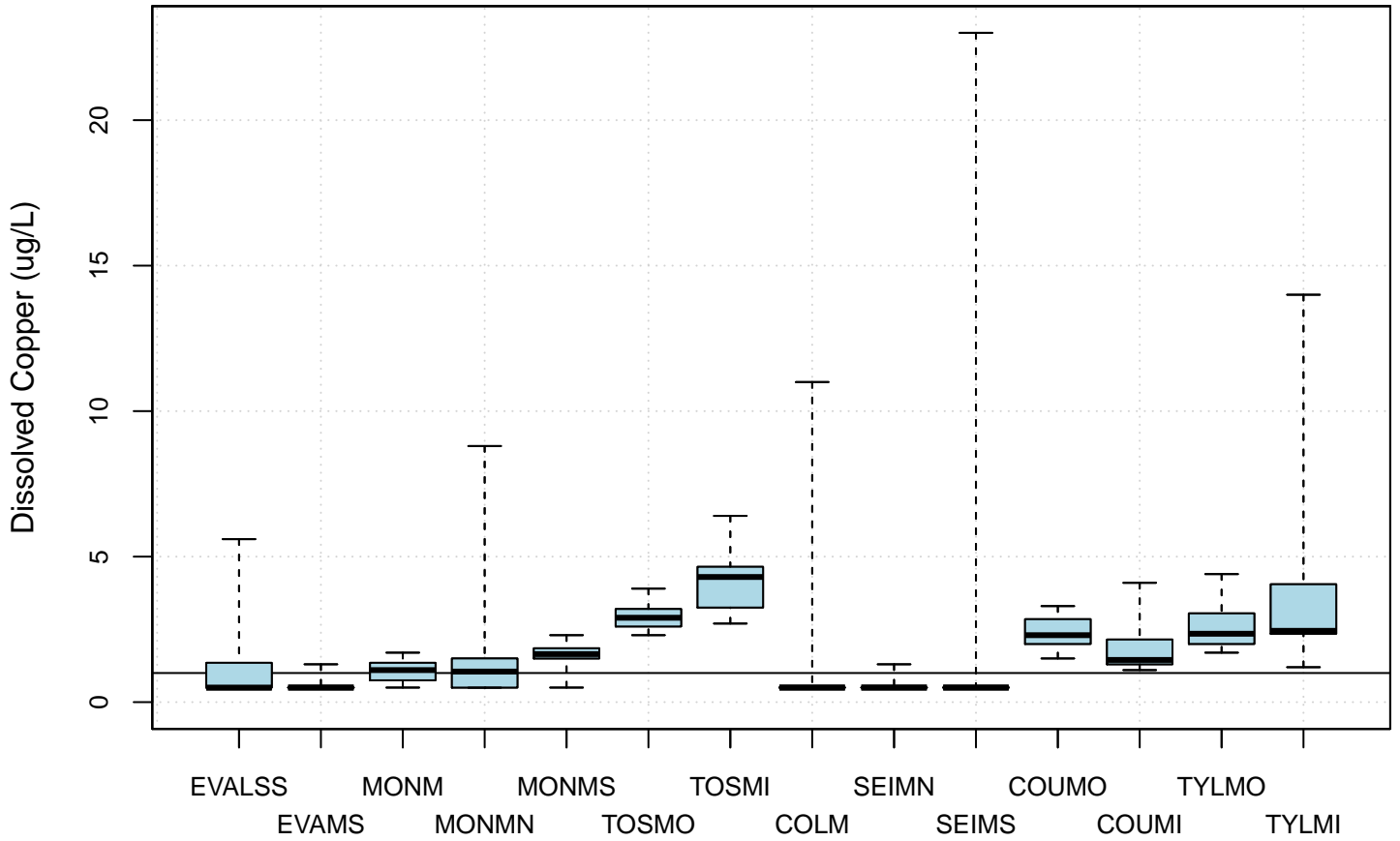
Storm Events



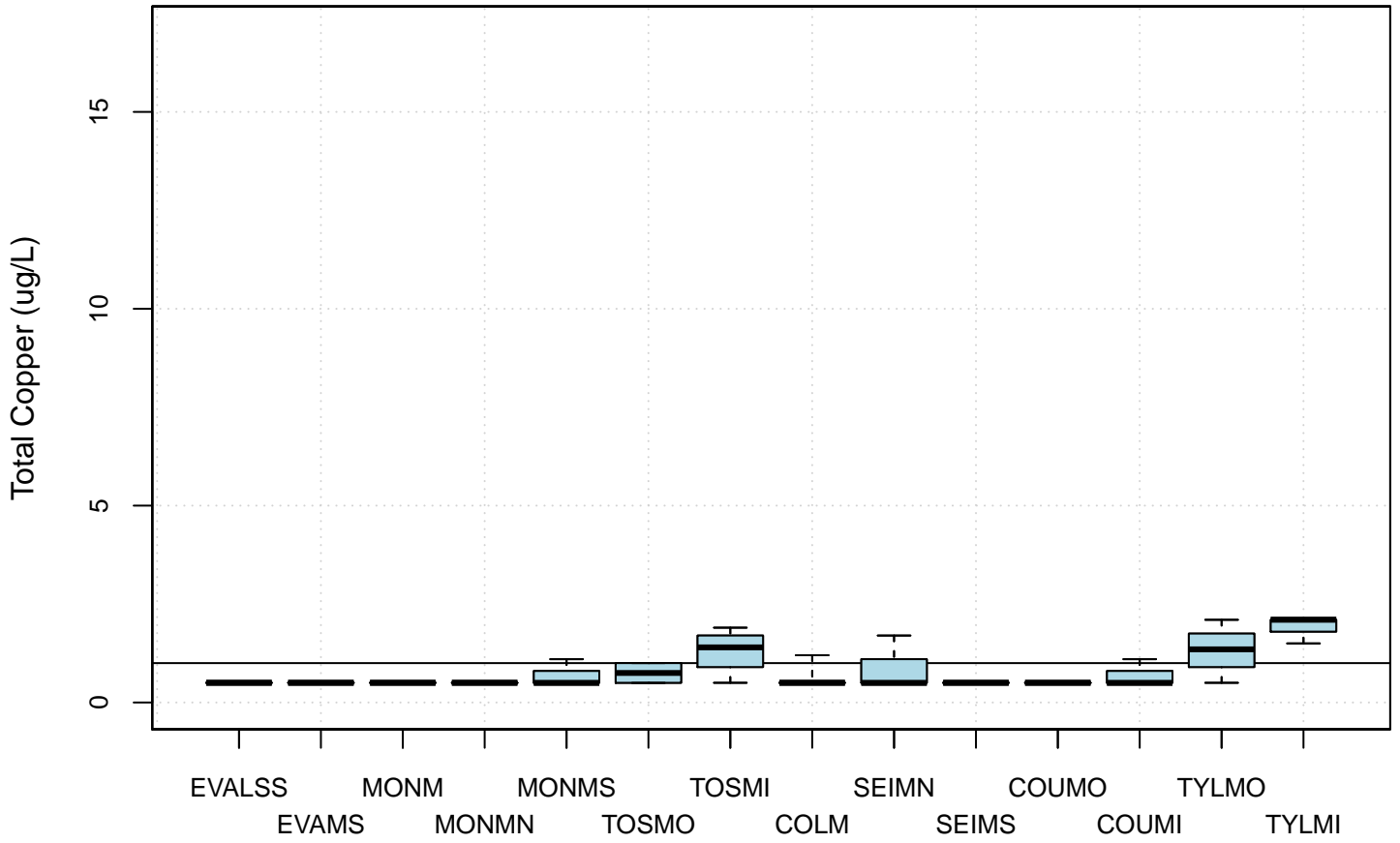
Base Flow



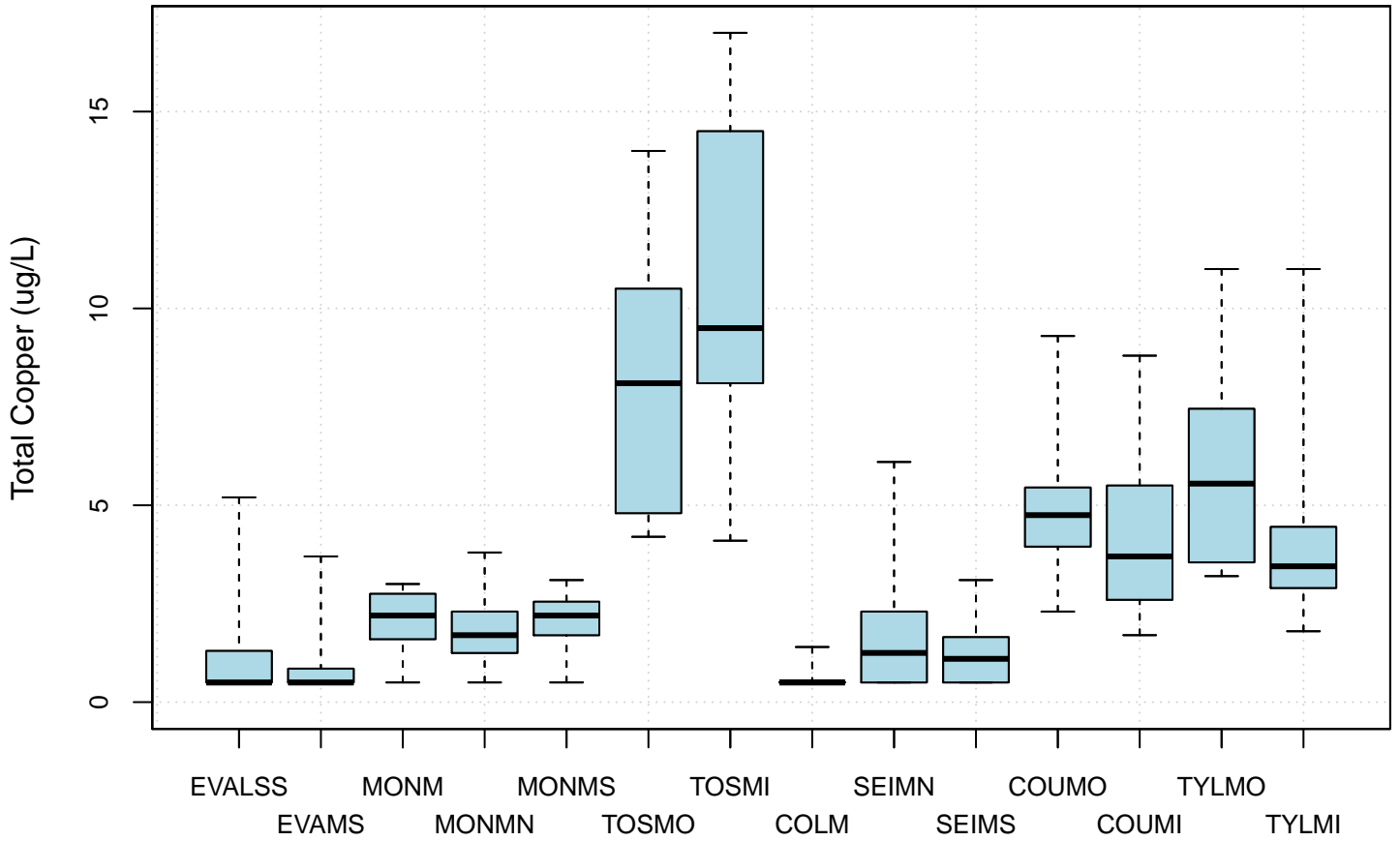
Storm Events



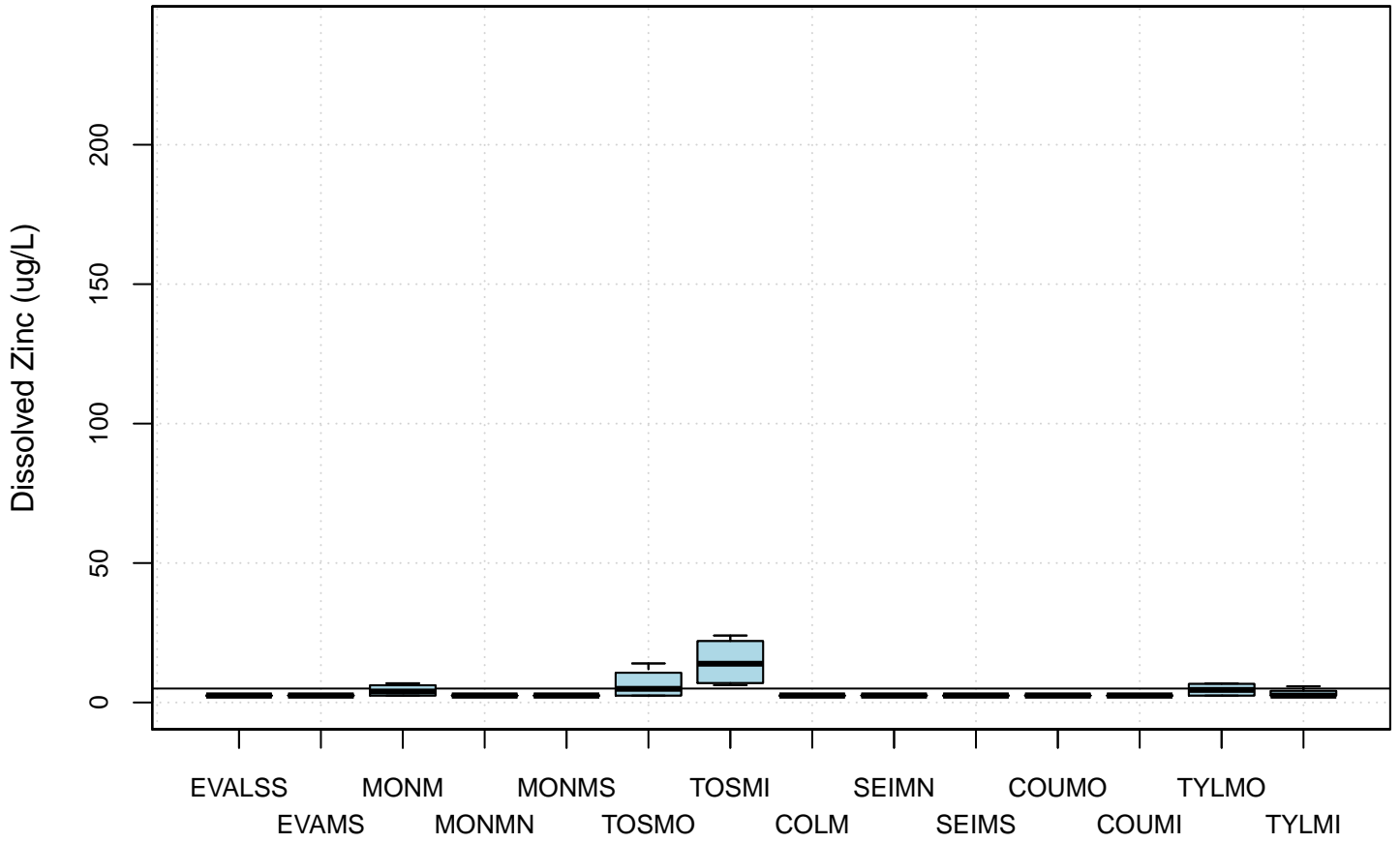
Base Flow



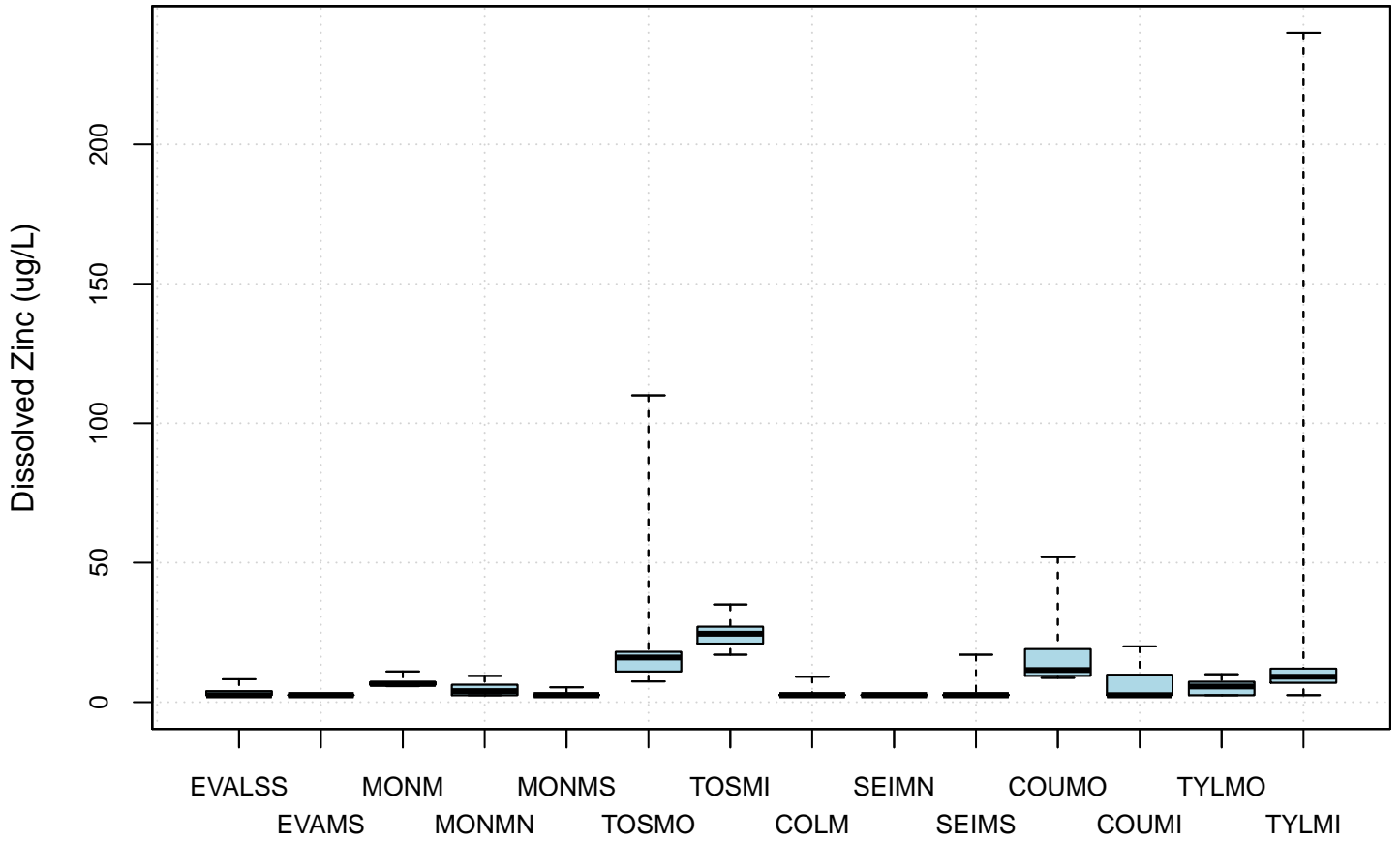
Storm Events



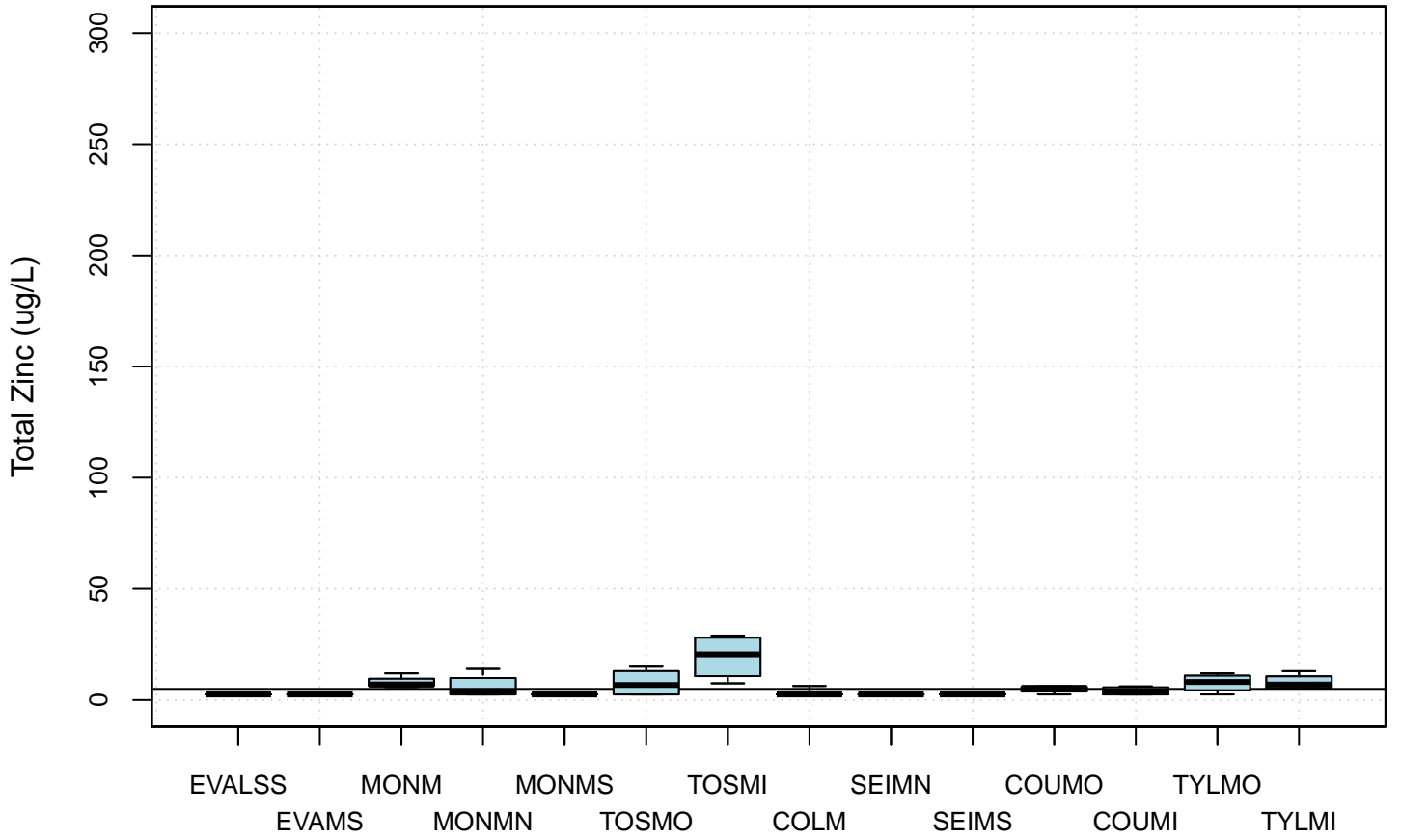
Base Flow



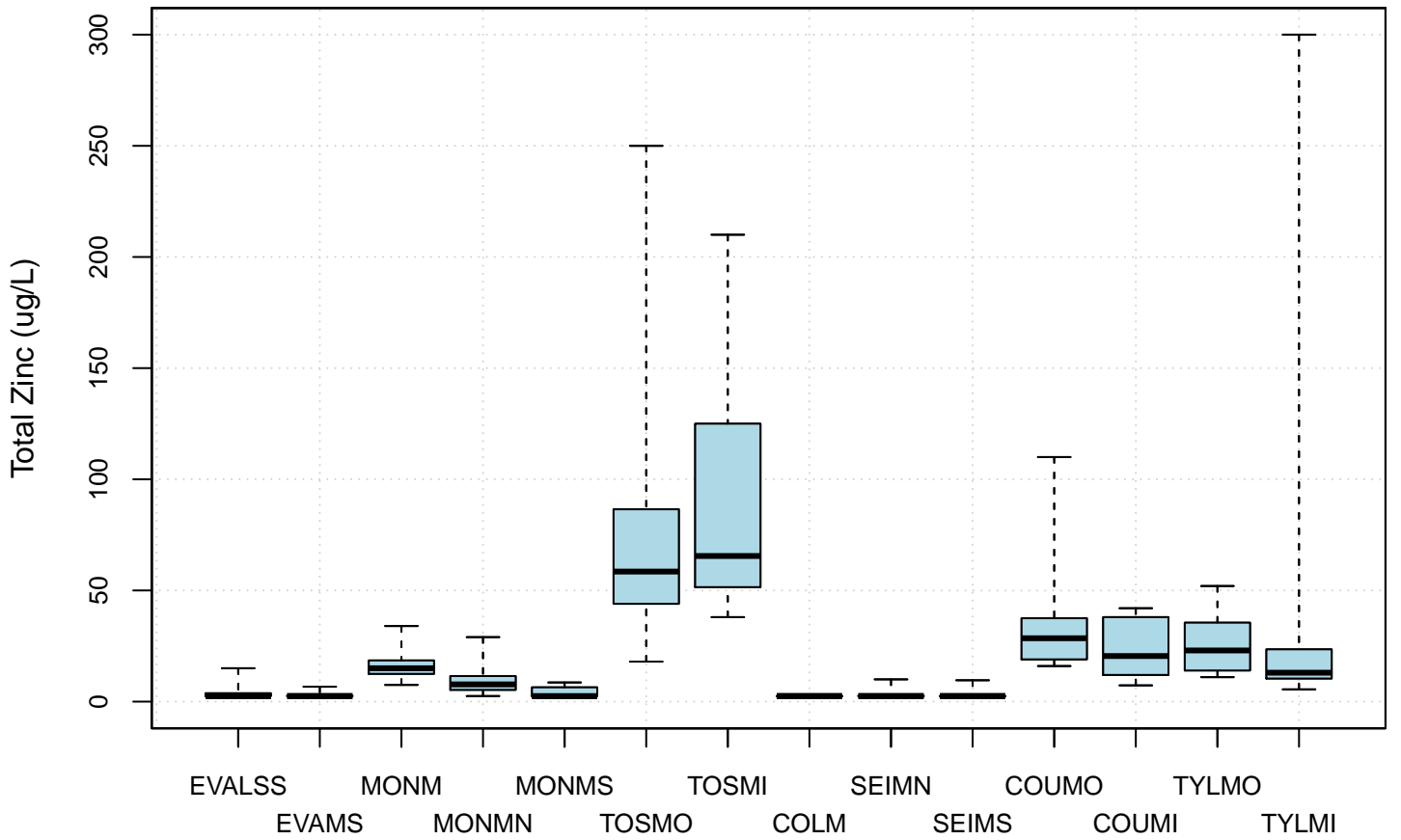
Storm Events



Base Flow



Storm Events



APPENDIX J

Line Plots Showing Continuous Temperature Data

EVALSS

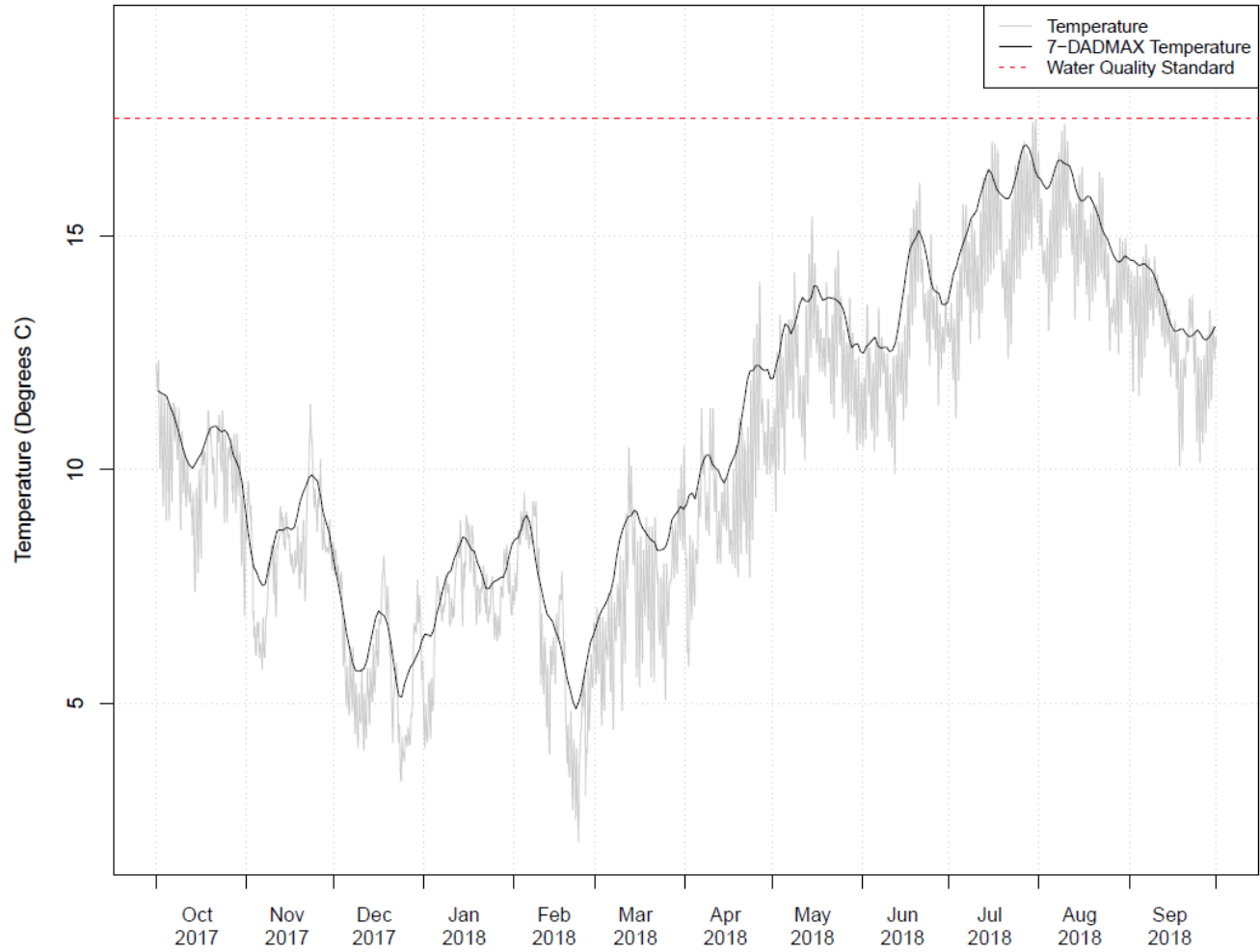


Figure J-1. Continuous Temperature and 7-DADMAX Measured at the EVALSS Station.

EVAMS

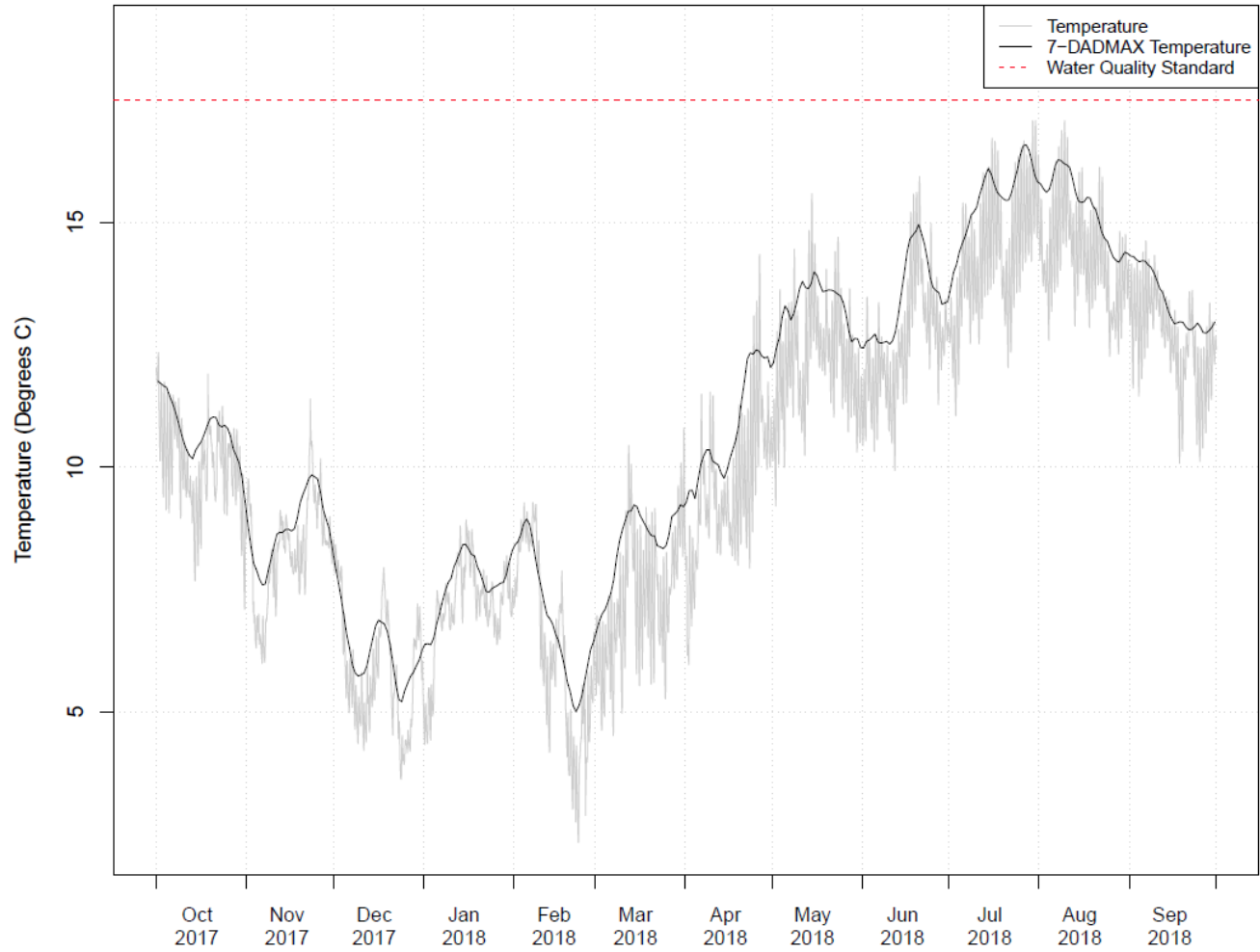


Figure J-2. Continuous Temperature and 7-DADMAX Measured at the EVAMS Station.

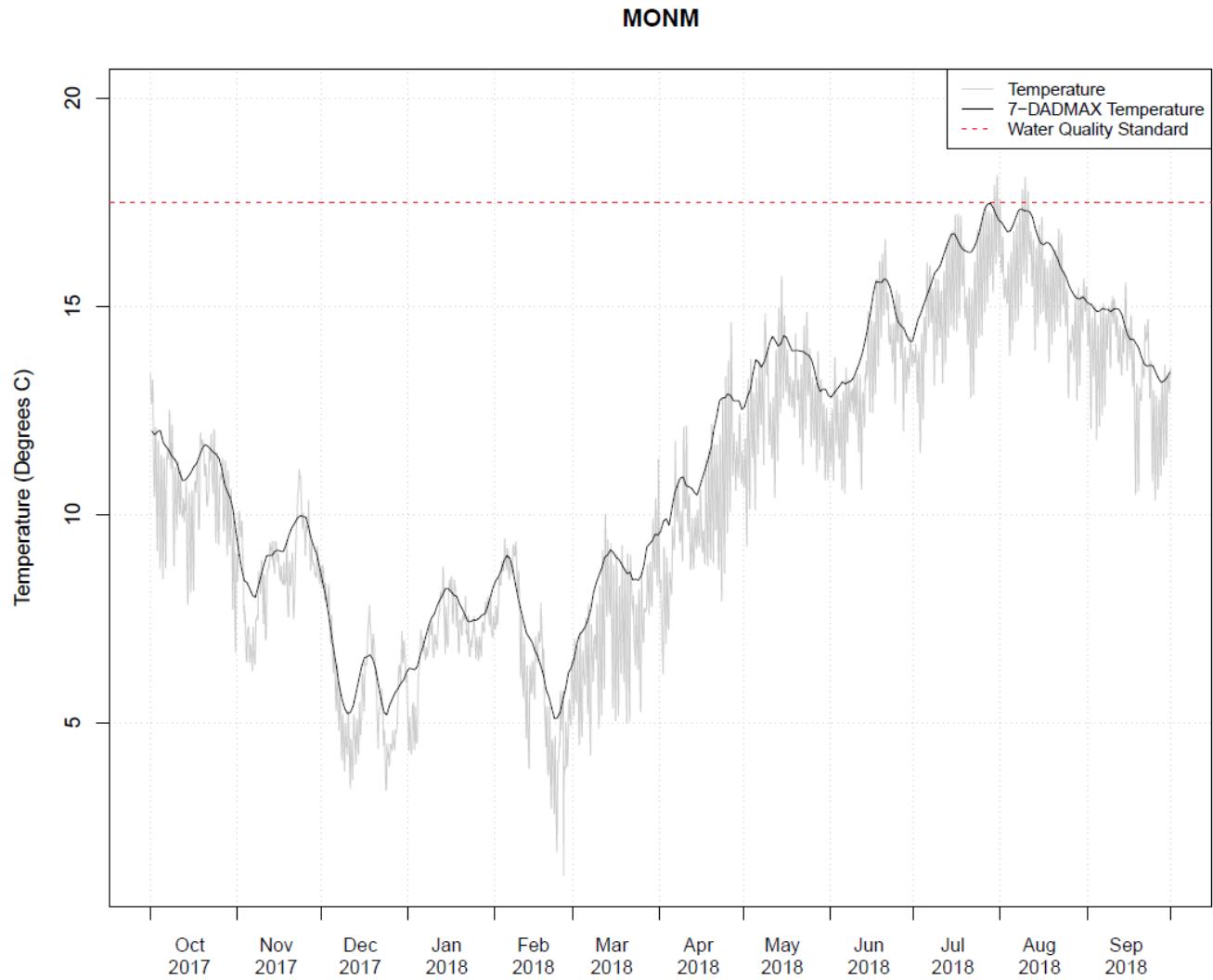


Figure J-3. Continuous Temperature and 7-DADMAX Measured at the MONM Station.

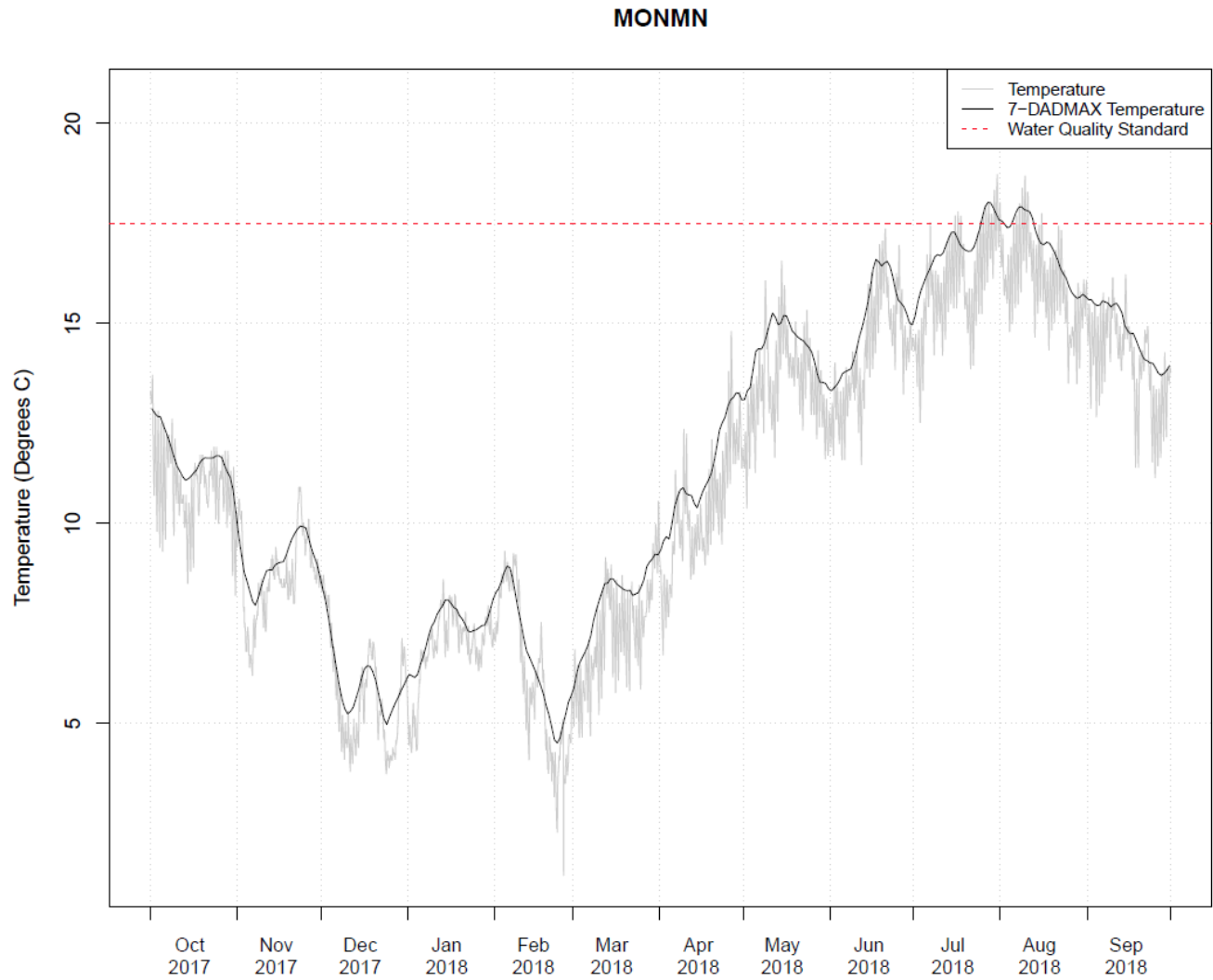


Figure J-4. Continuous Temperature and 7-DADMAX Measured at the MONMN Station.

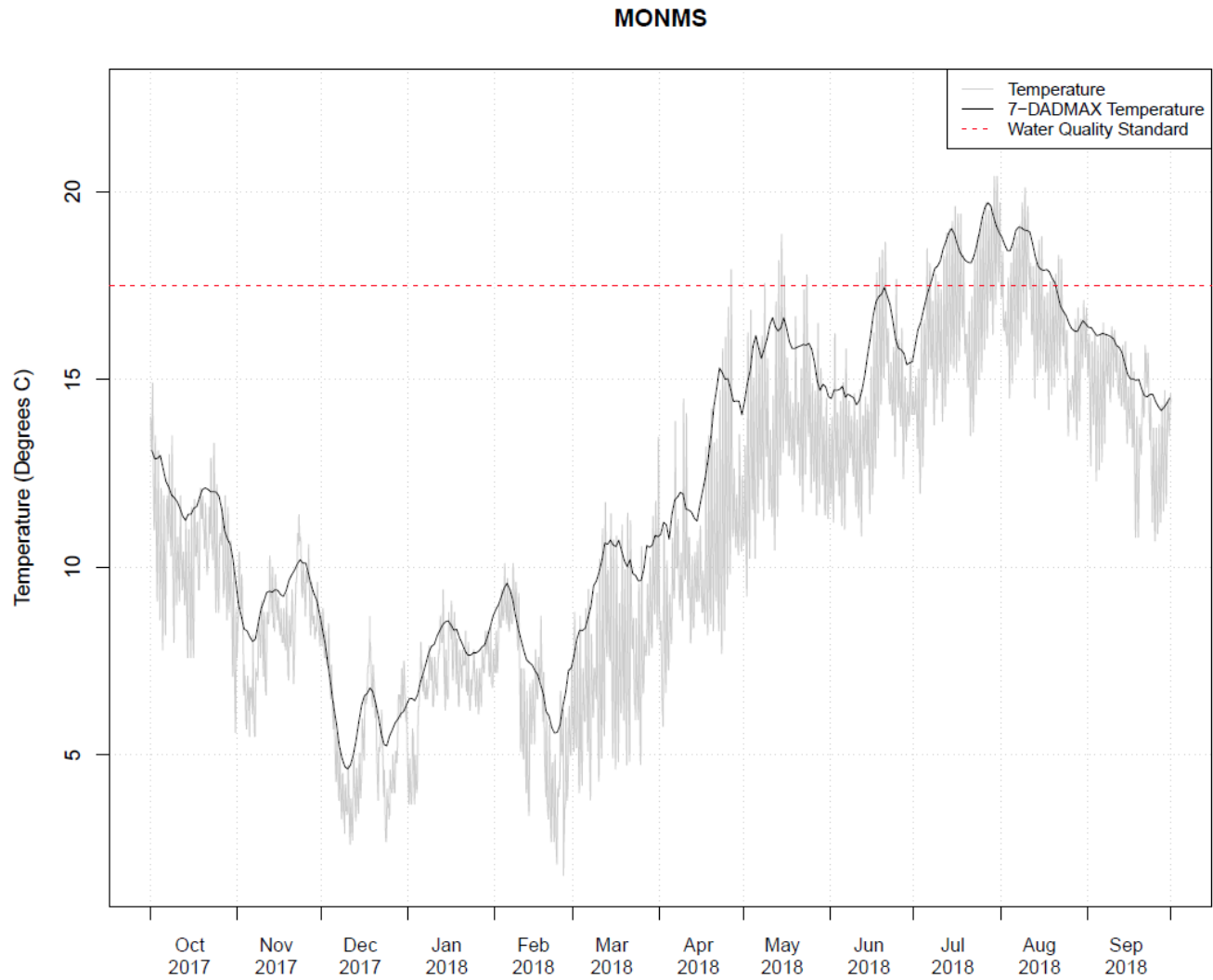


Figure J-5. Continuous Temperature and 7-DADMAX Measured at the MONMS Station.

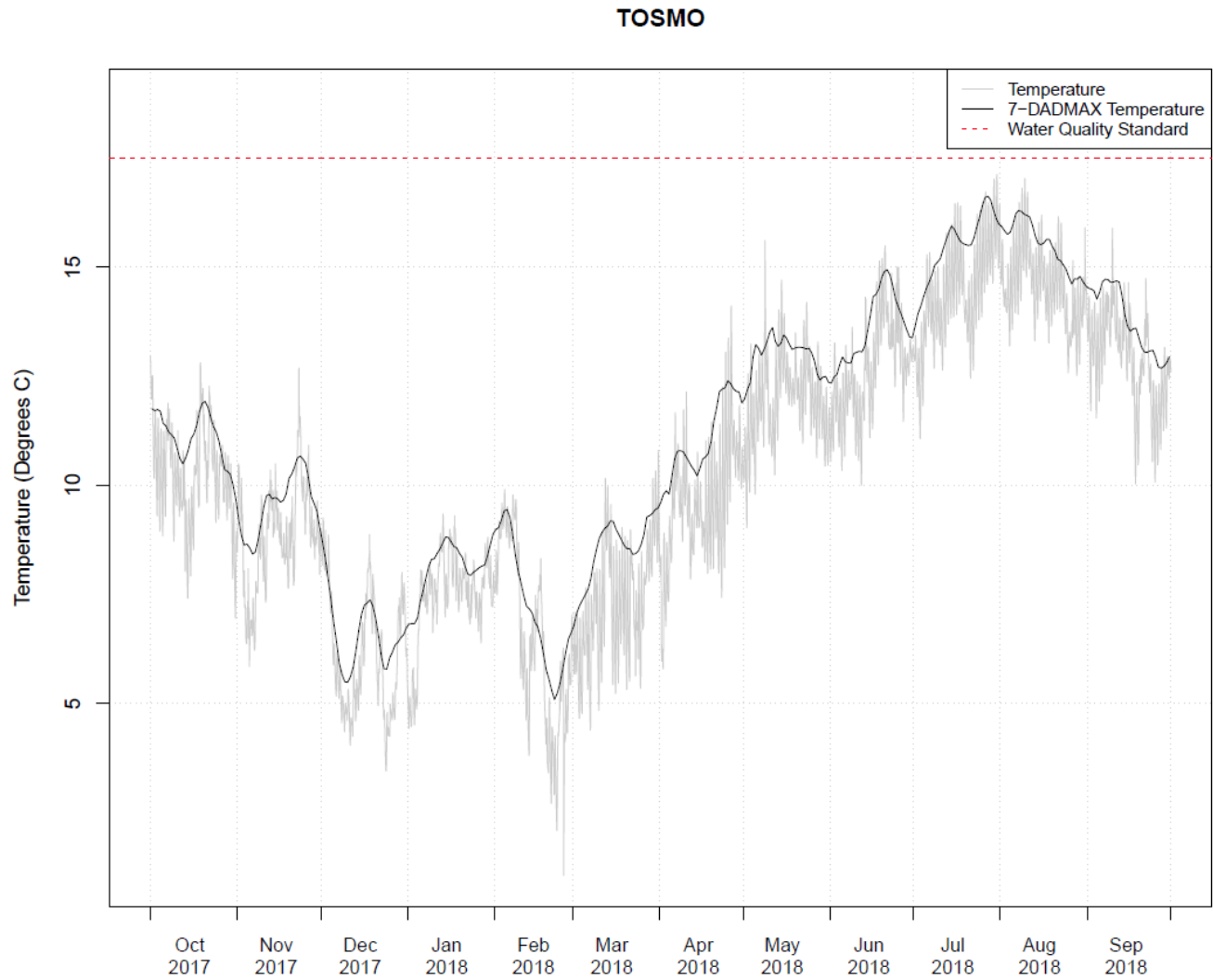


Figure J-6. Continuous Temperature and 7-DADMAX Measured at the TOSMO Station.

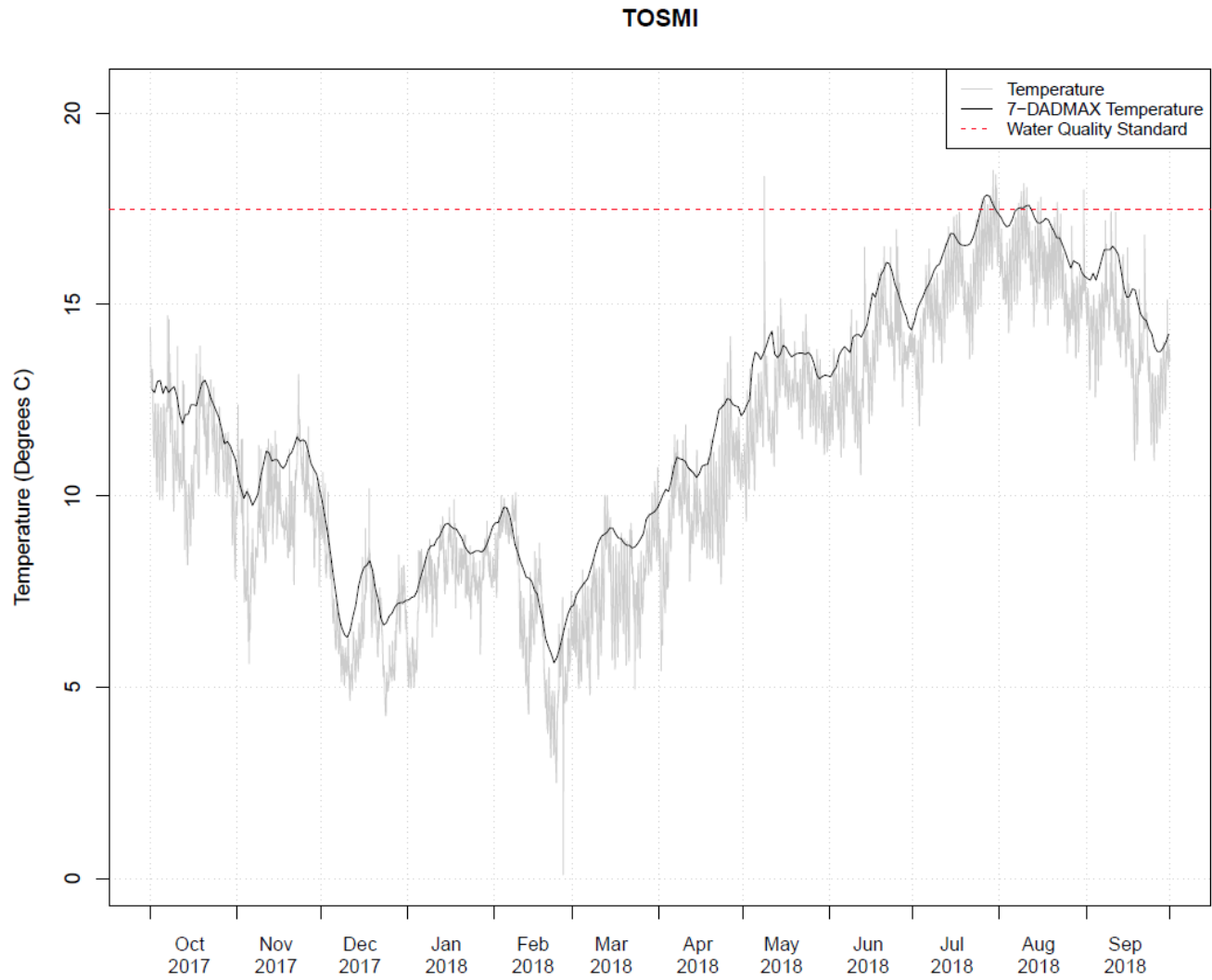


Figure J-7. Continuous Temperature and 7-DADMAX Measured at the TOSMI Station.

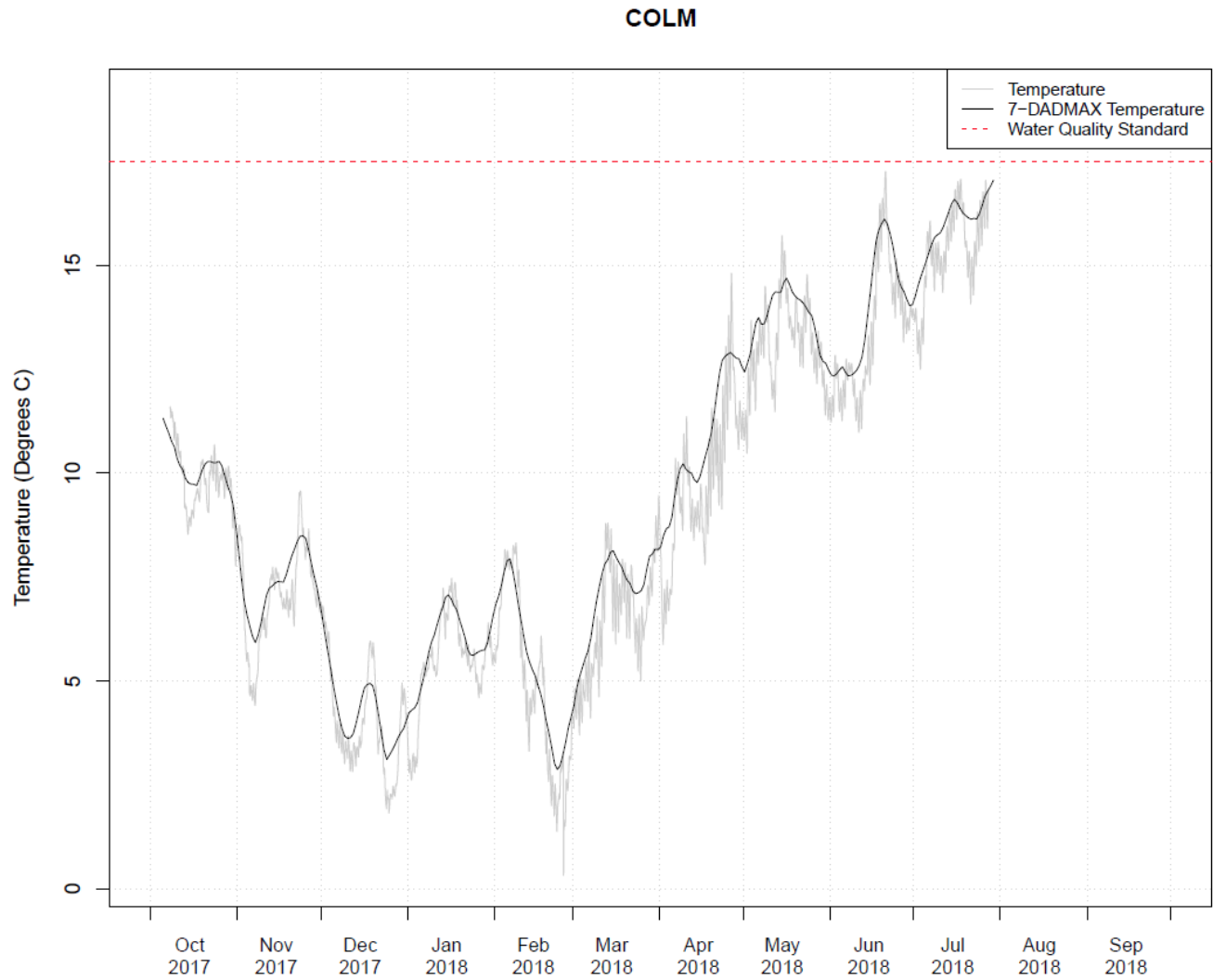


Figure J-8. Continuous Temperature and 7-DADMAX Measured at the COLM Station.

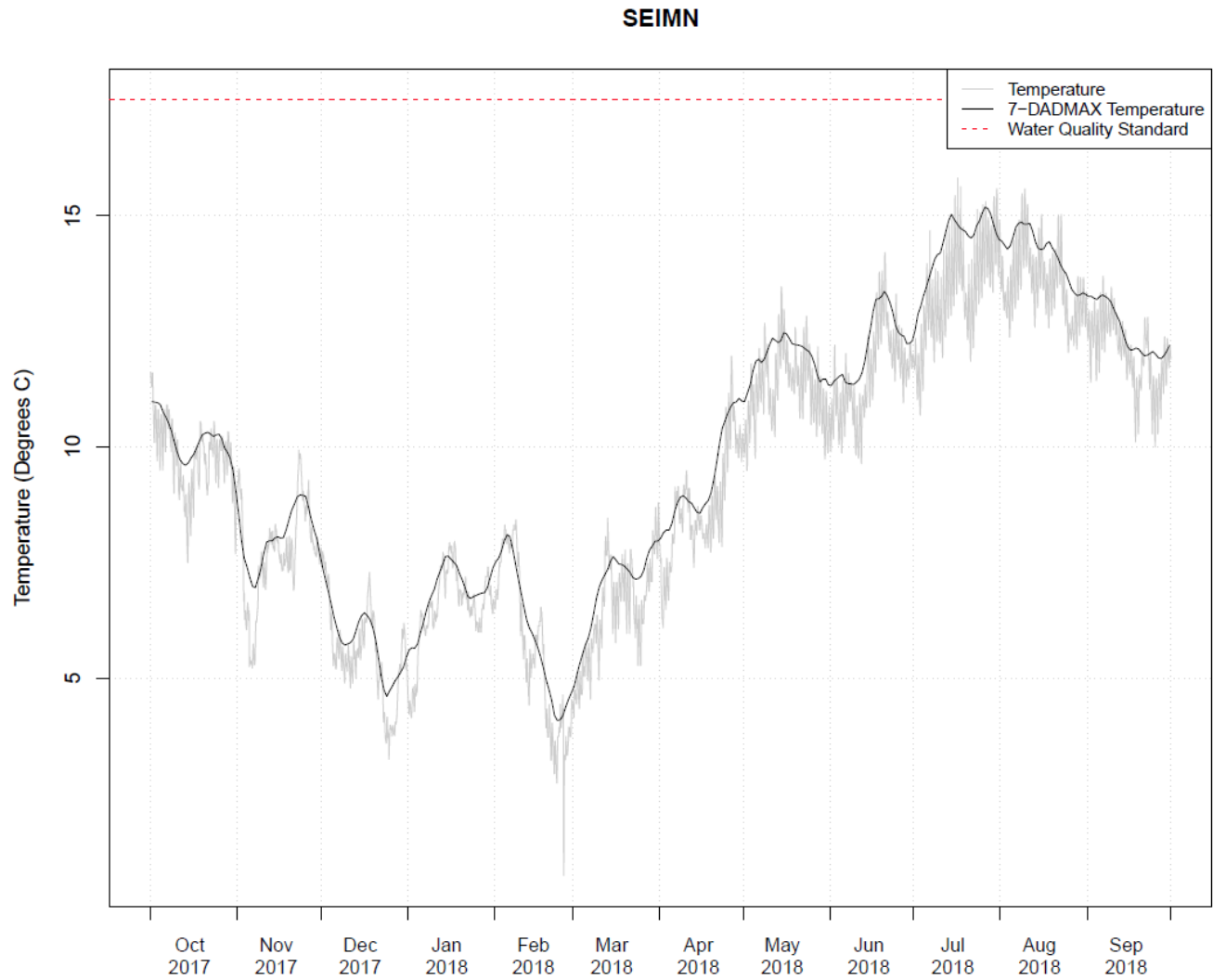


Figure J-9. Continuous Temperature and 7-DADMAX Measured at the SEIMN Station.

SEIMS

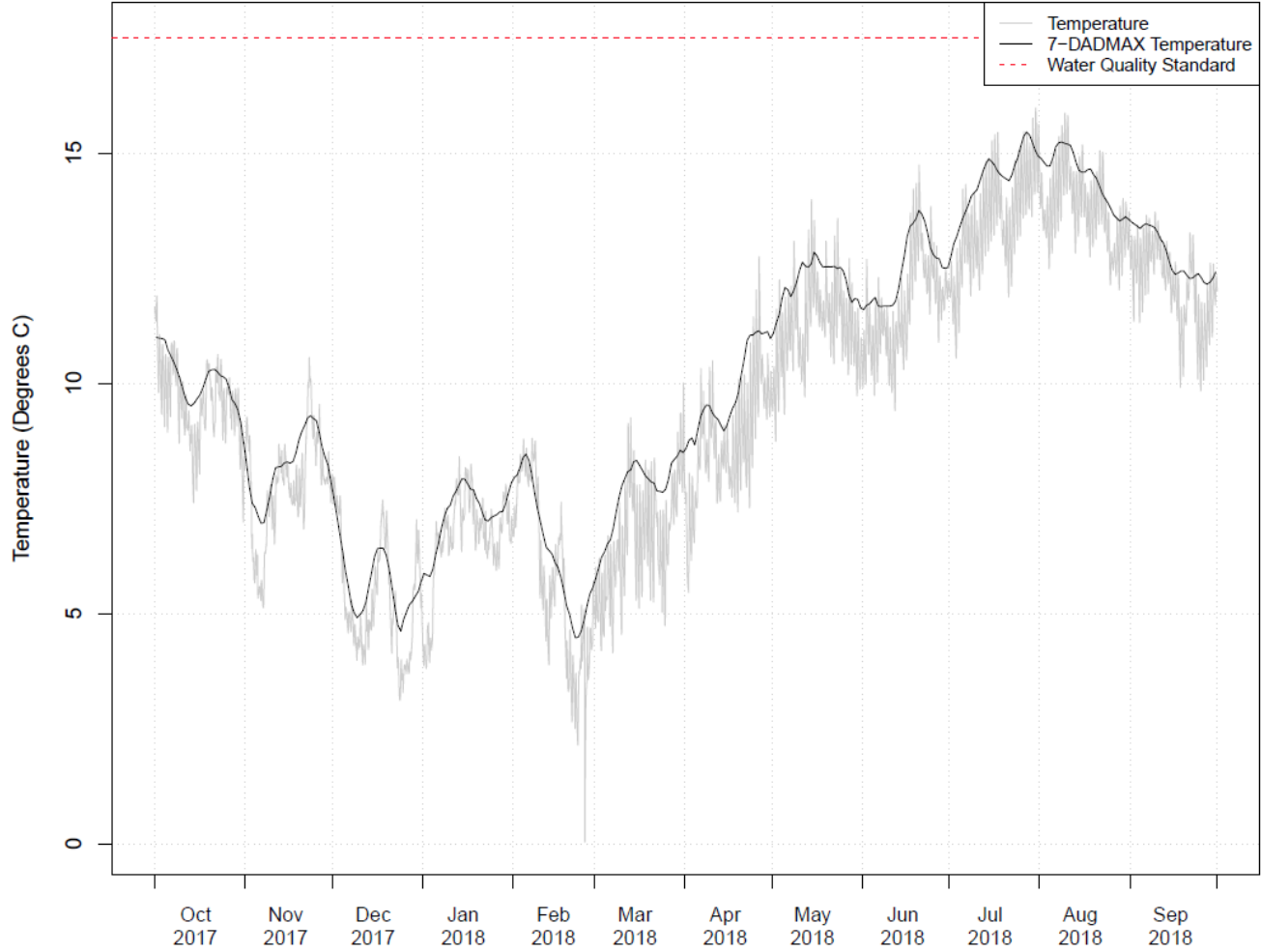


Figure J-10. Continuous Temperature and 7-DADMAX Measured at the SEIMS Station.

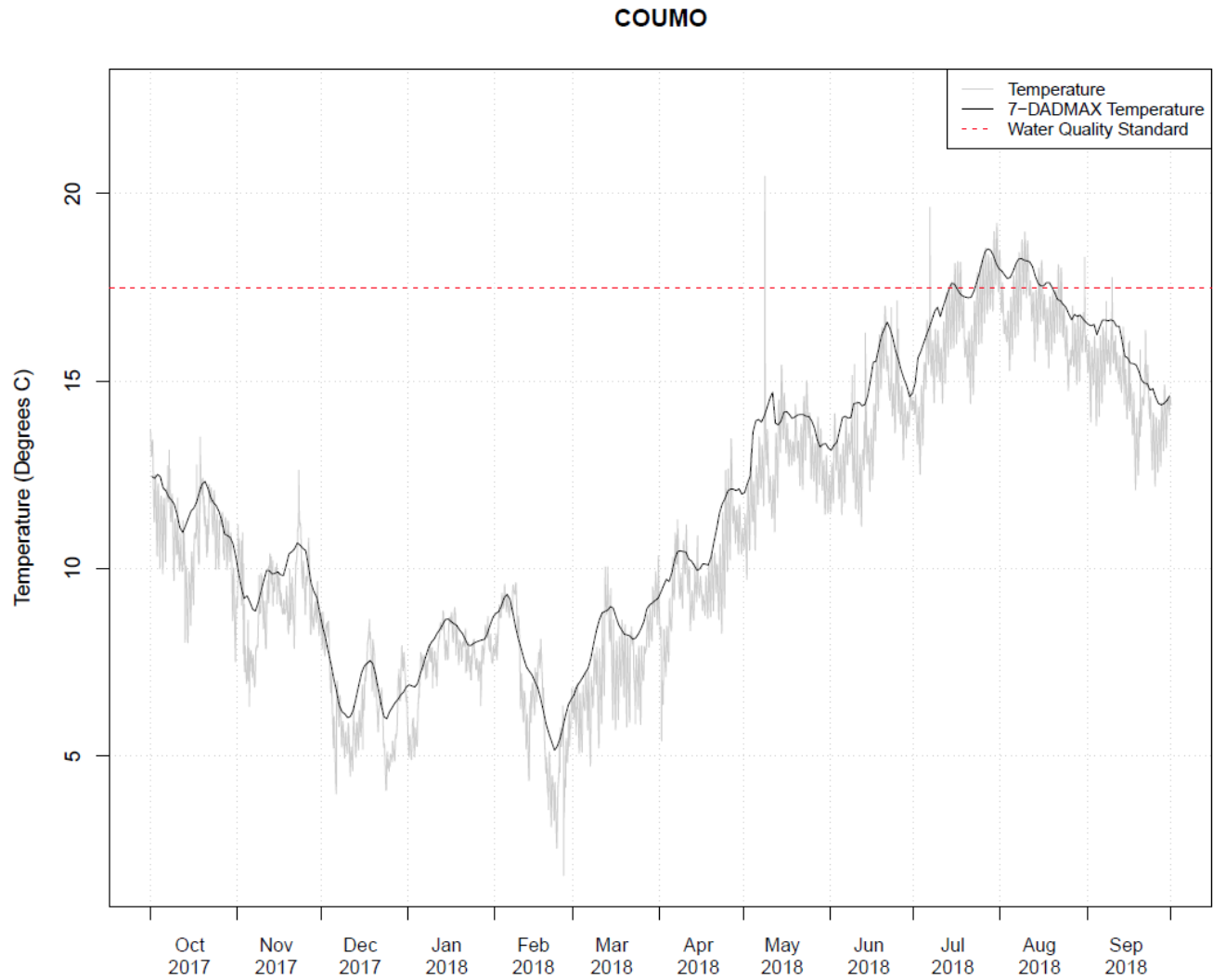


Figure J-11. Continuous Temperature and 7-DADMAX Measured at the COUMO Station.

COUMI

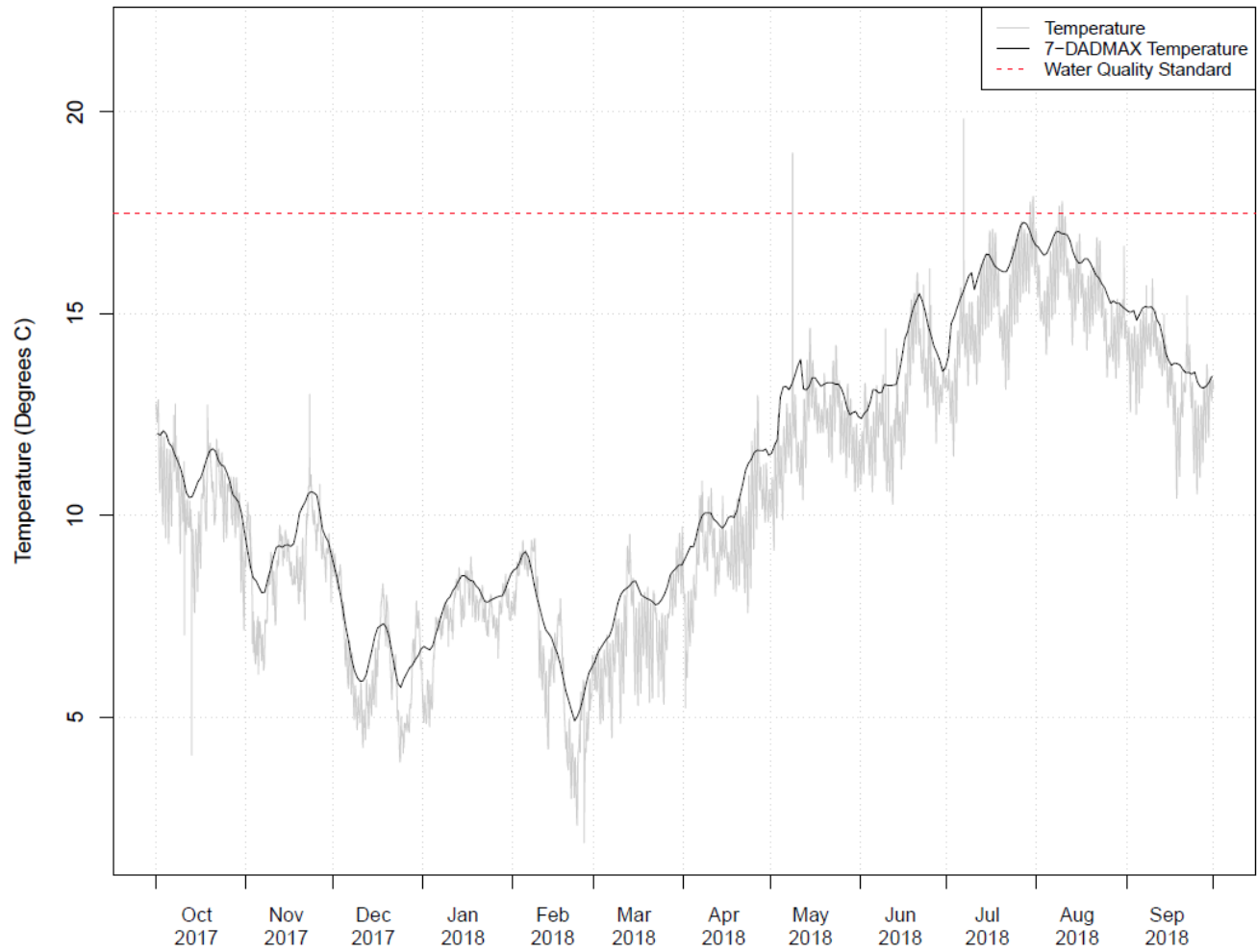


Figure J-12. Continuous Temperature and 7-DADMAX Measured at the COUMI Station.

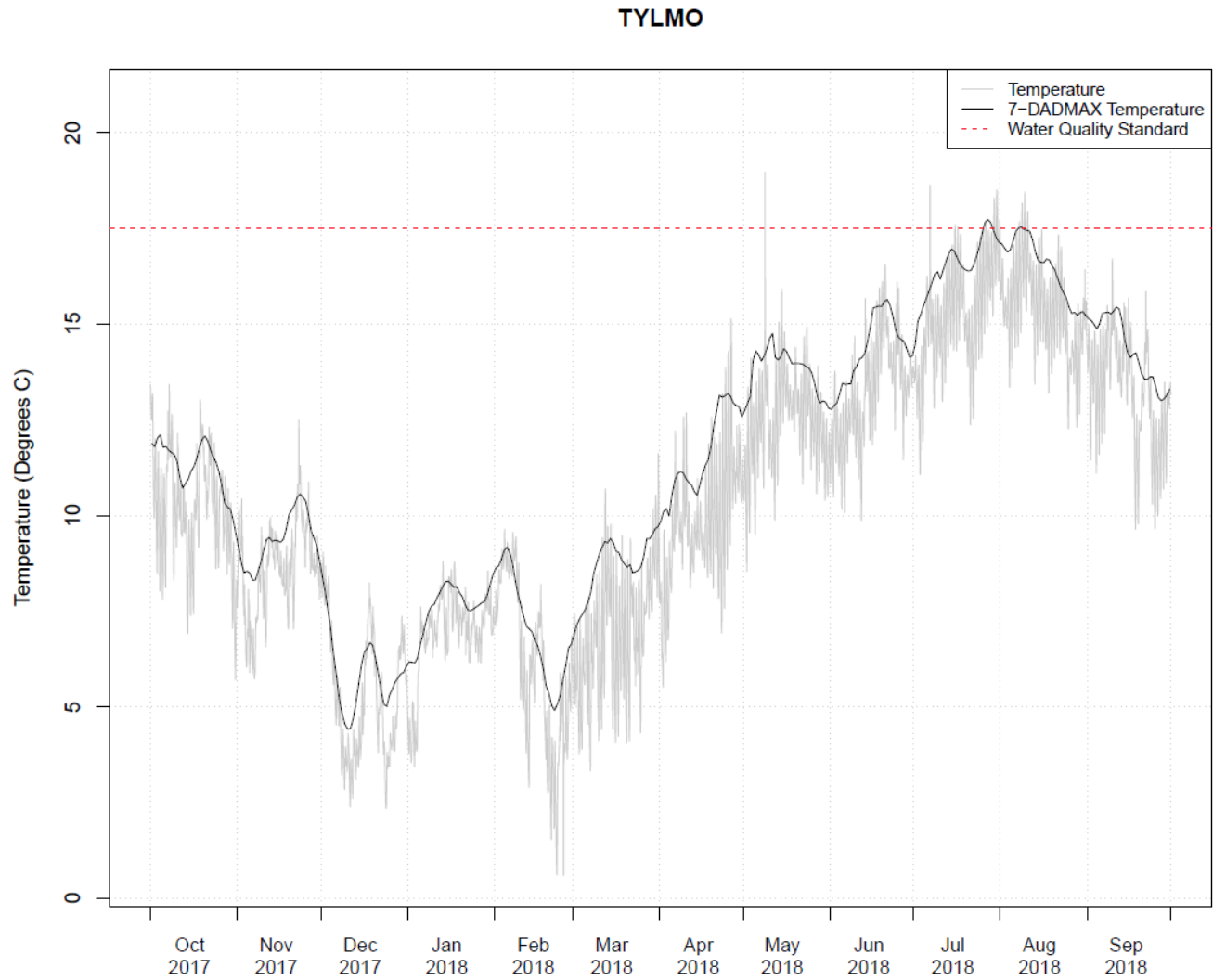


Figure J-13. Continuous Temperature and 7-DADMAX Measured at the TYLMO Station.

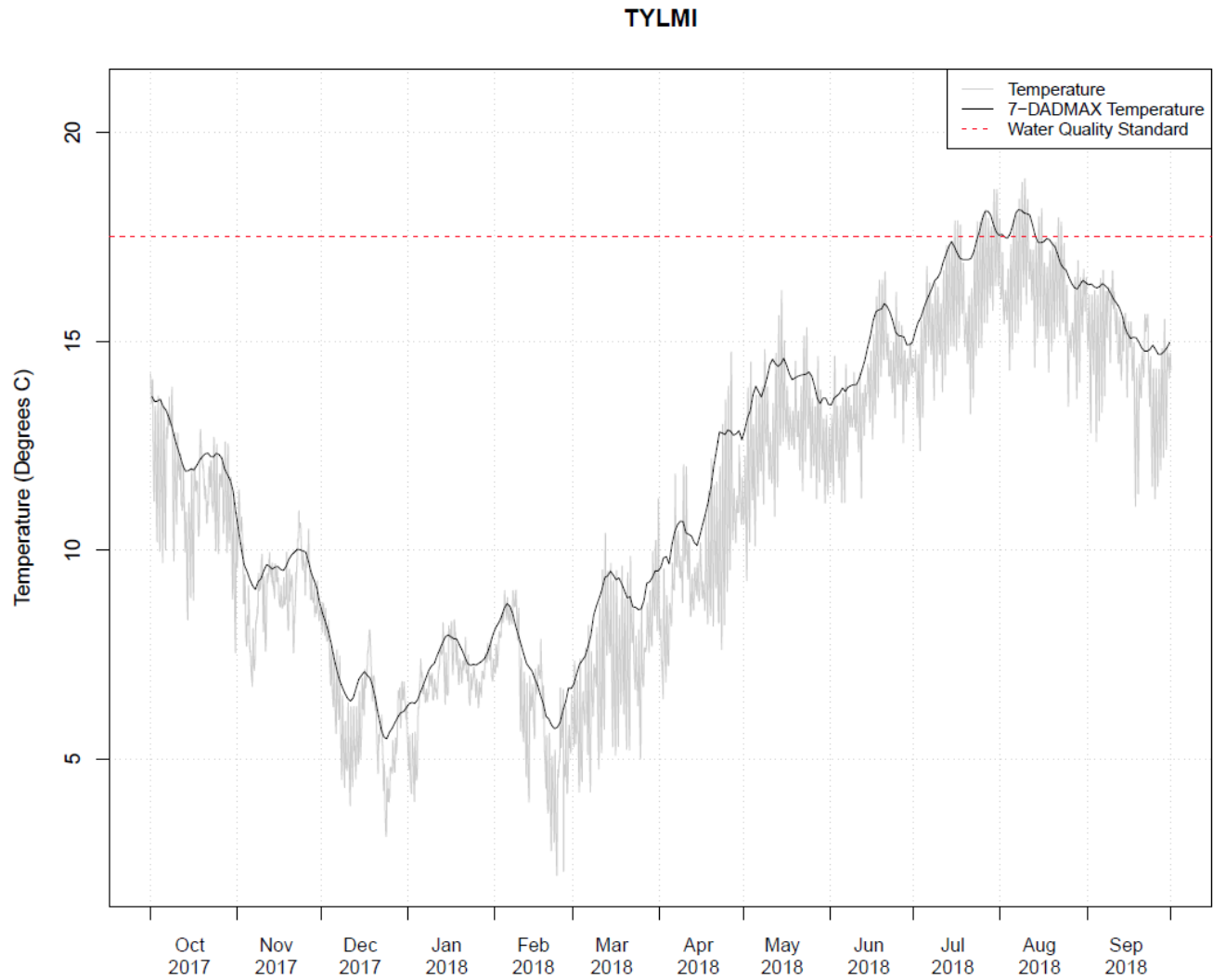


Figure J-14. Continuous Temperature and 7-DADMAX Measured at the TYLMI Station.

APPENDIX K

Line Plots Showing Continuous Conductivity Data

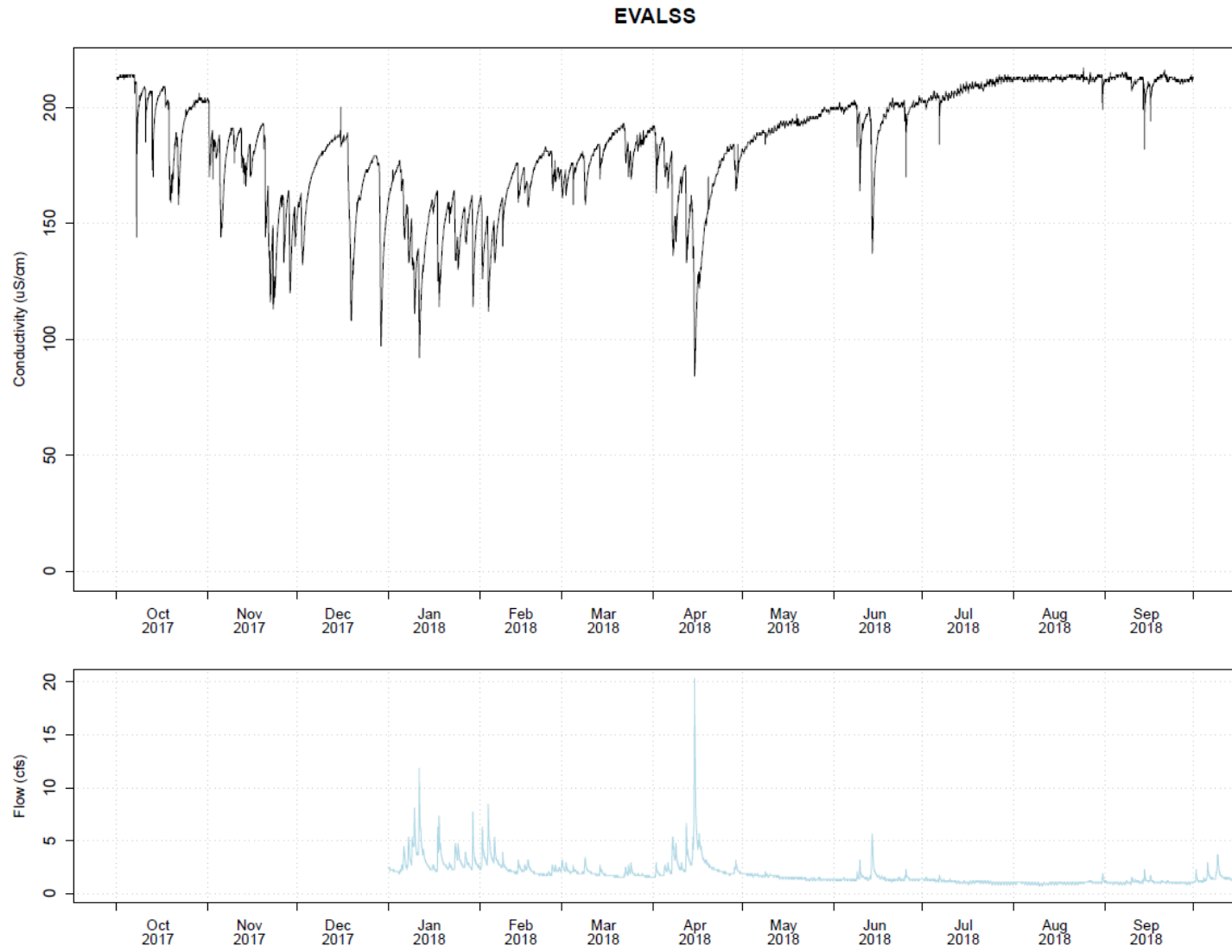


Figure K-1. Continuous Conductivity Measured at the EVALSS Station.

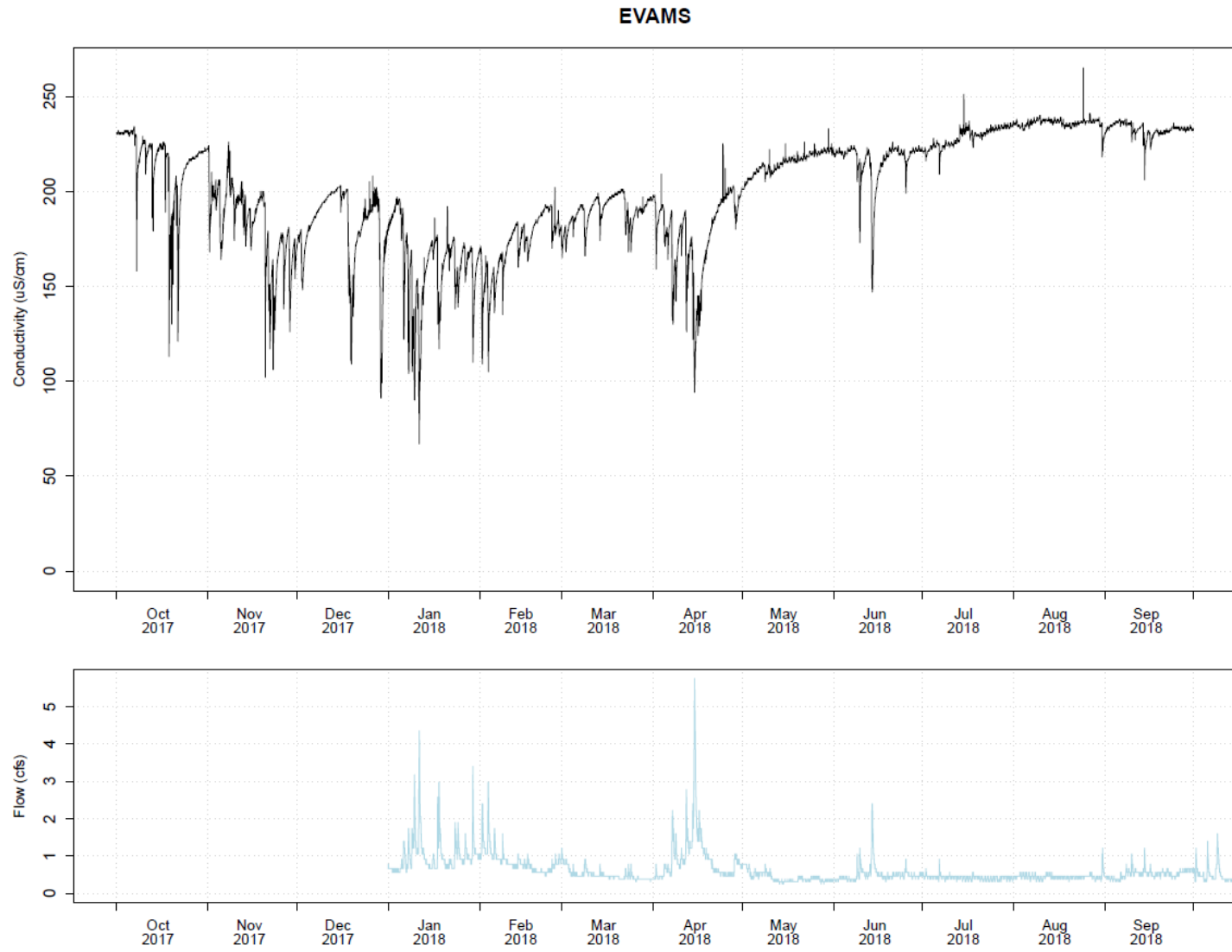


Figure K-2. Continuous Conductivity Measured at the EVAMS Station.

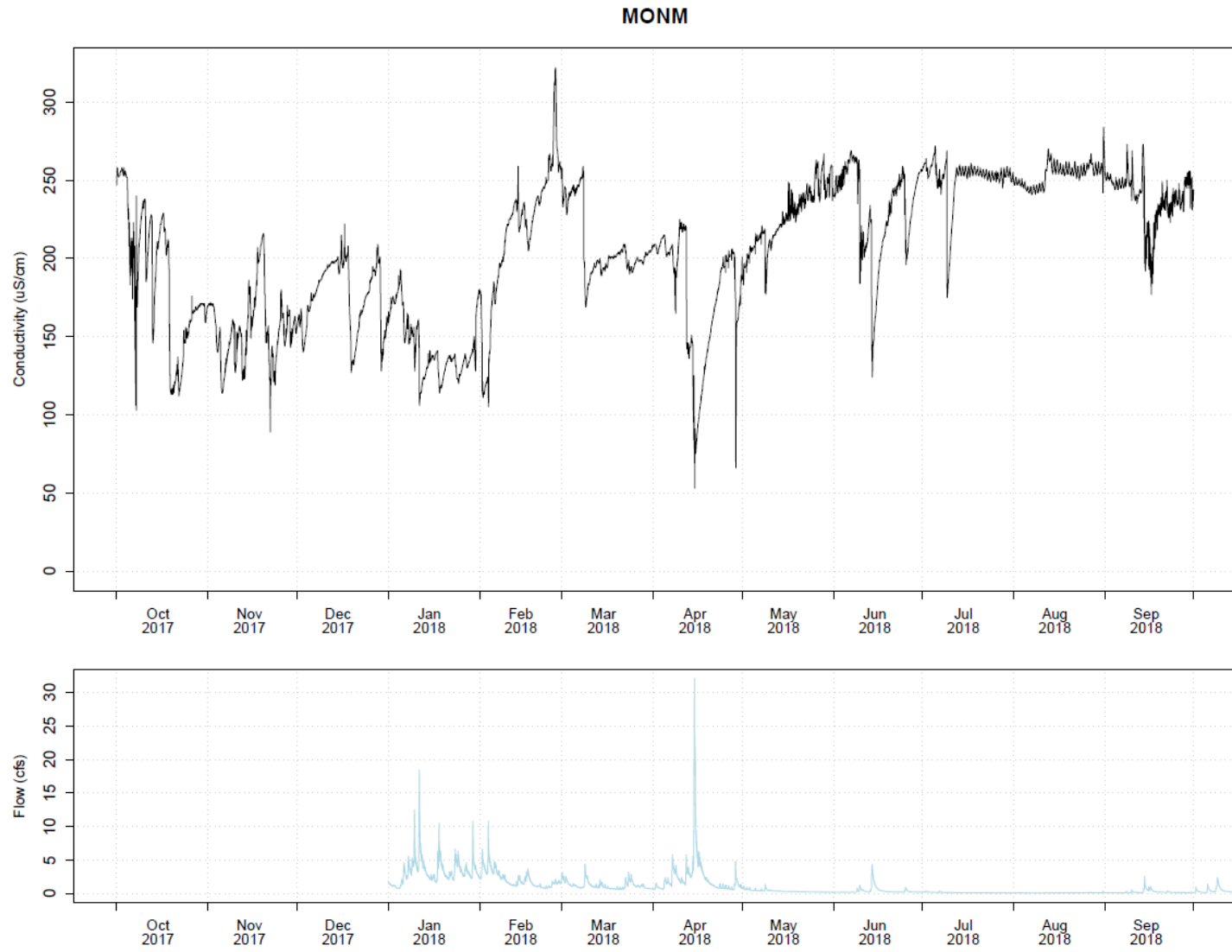


Figure K-3. Continuous Conductivity Measured at the MONM Station.

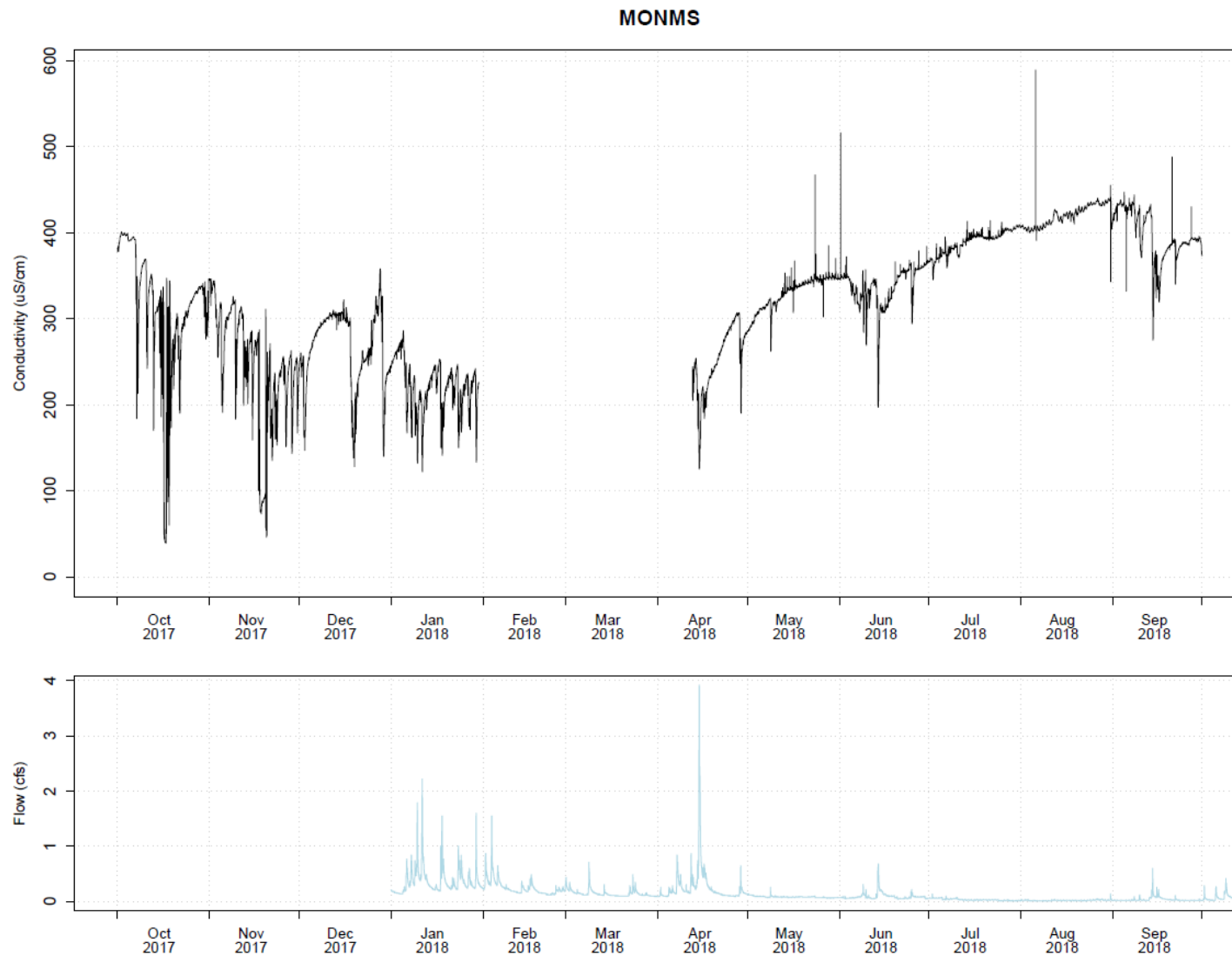


Figure K-4. Continuous Conductivity Measured at the MONMS Station.

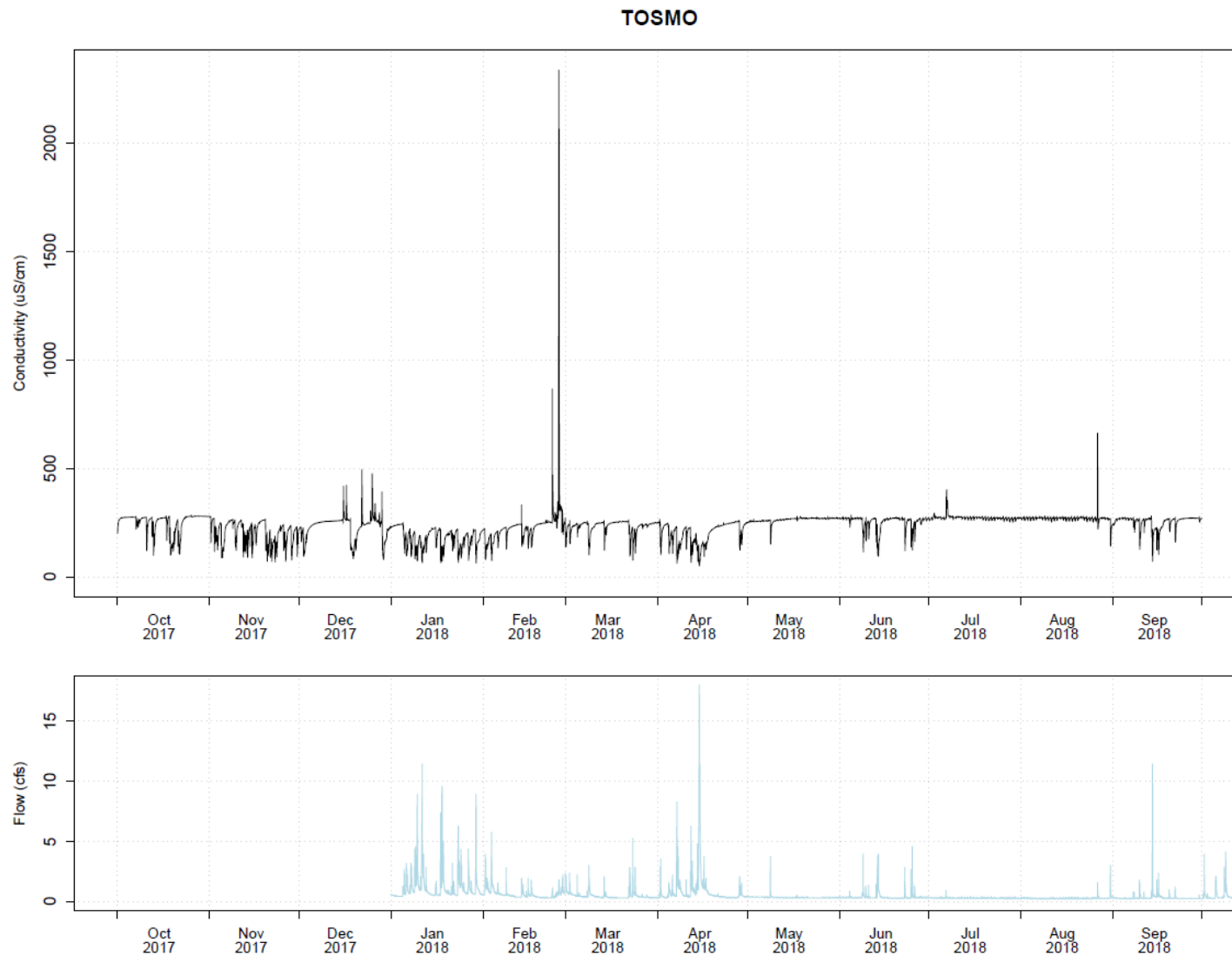


Figure K-5. Continuous Conductivity Measured at the TOSMO Station.

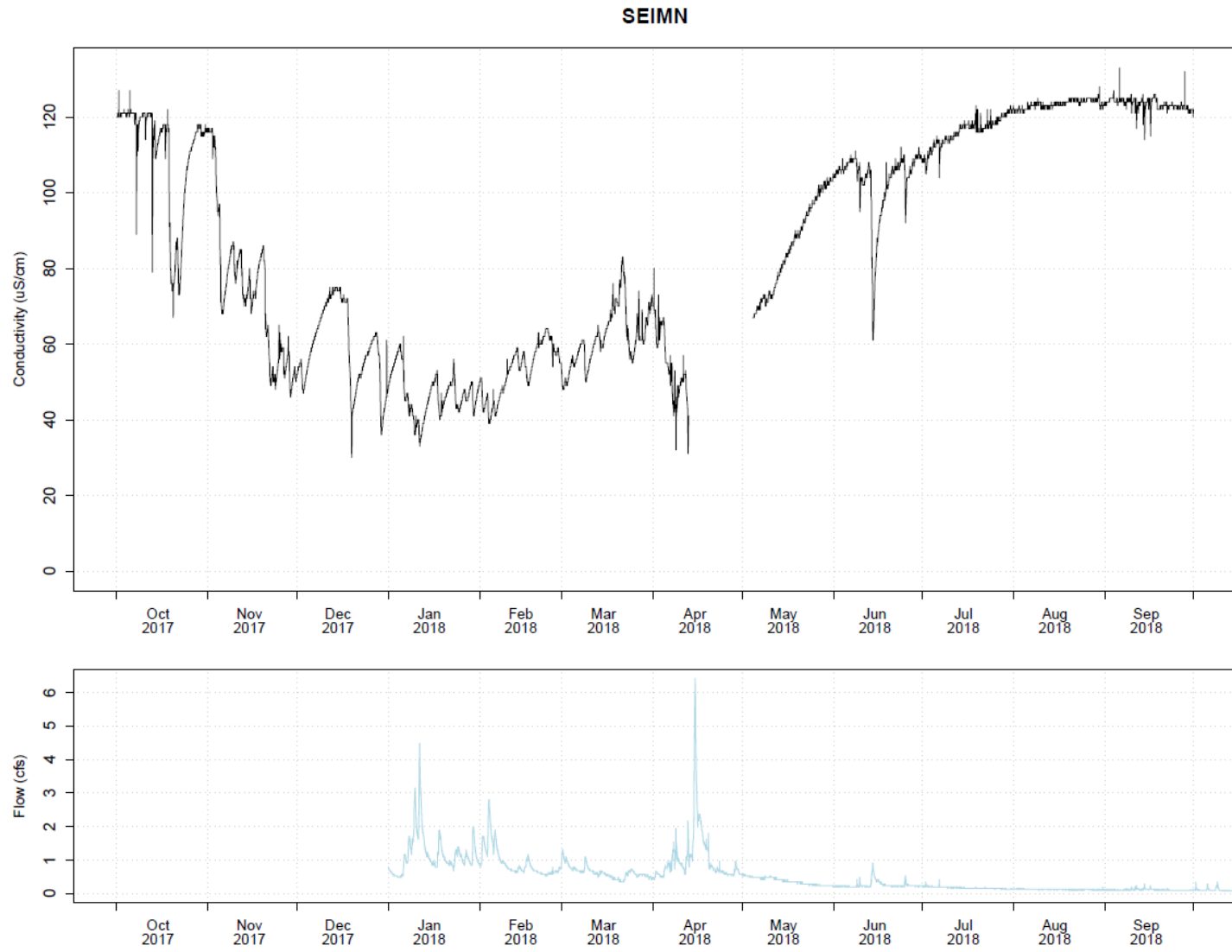


Figure K-6. Continuous Conductivity Measured at the SEIMN Station.

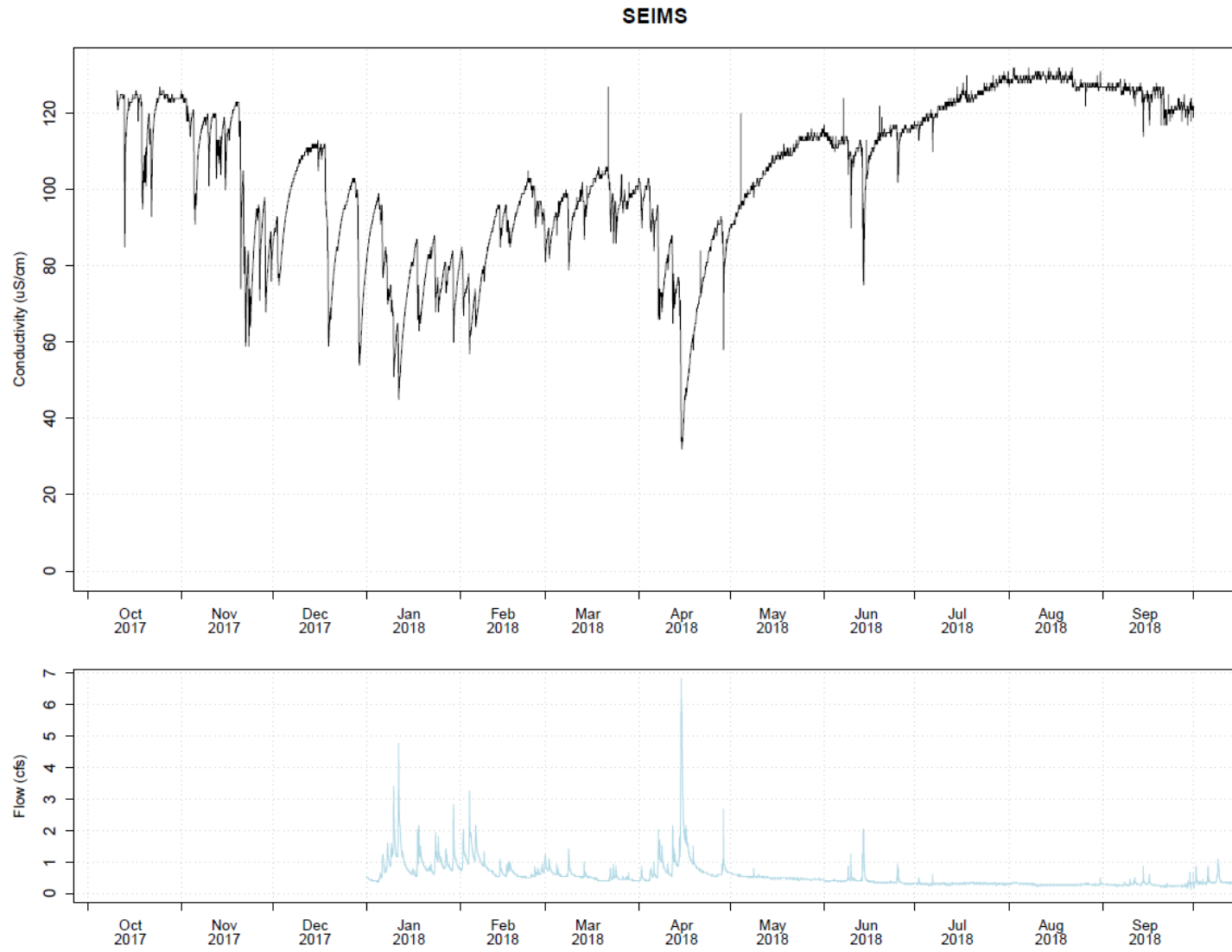


Figure K-7. Continuous Conductivity Measured at the SEIMS Station.

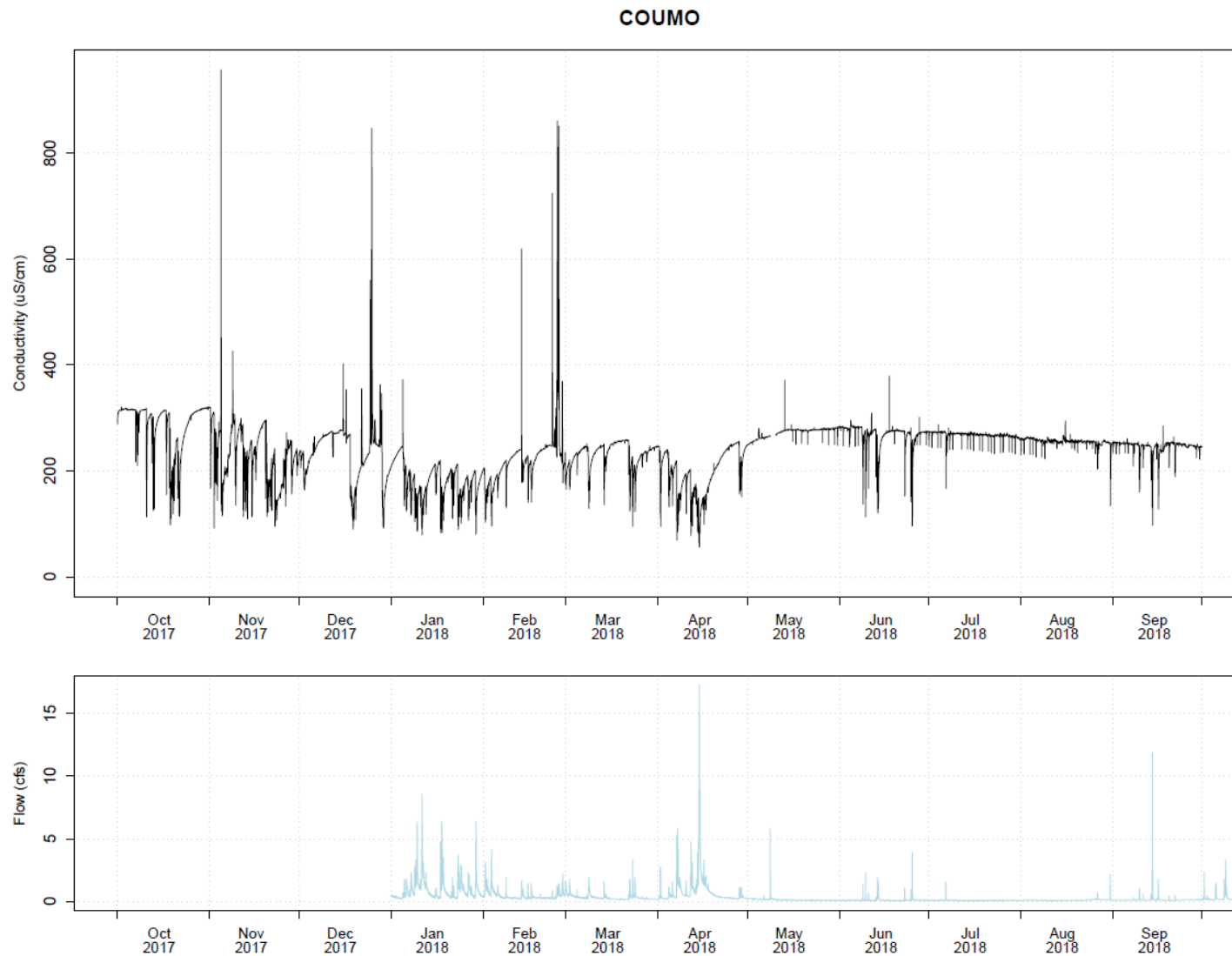


Figure K-8. Continuous Conductivity Measured at the COUMO Station.

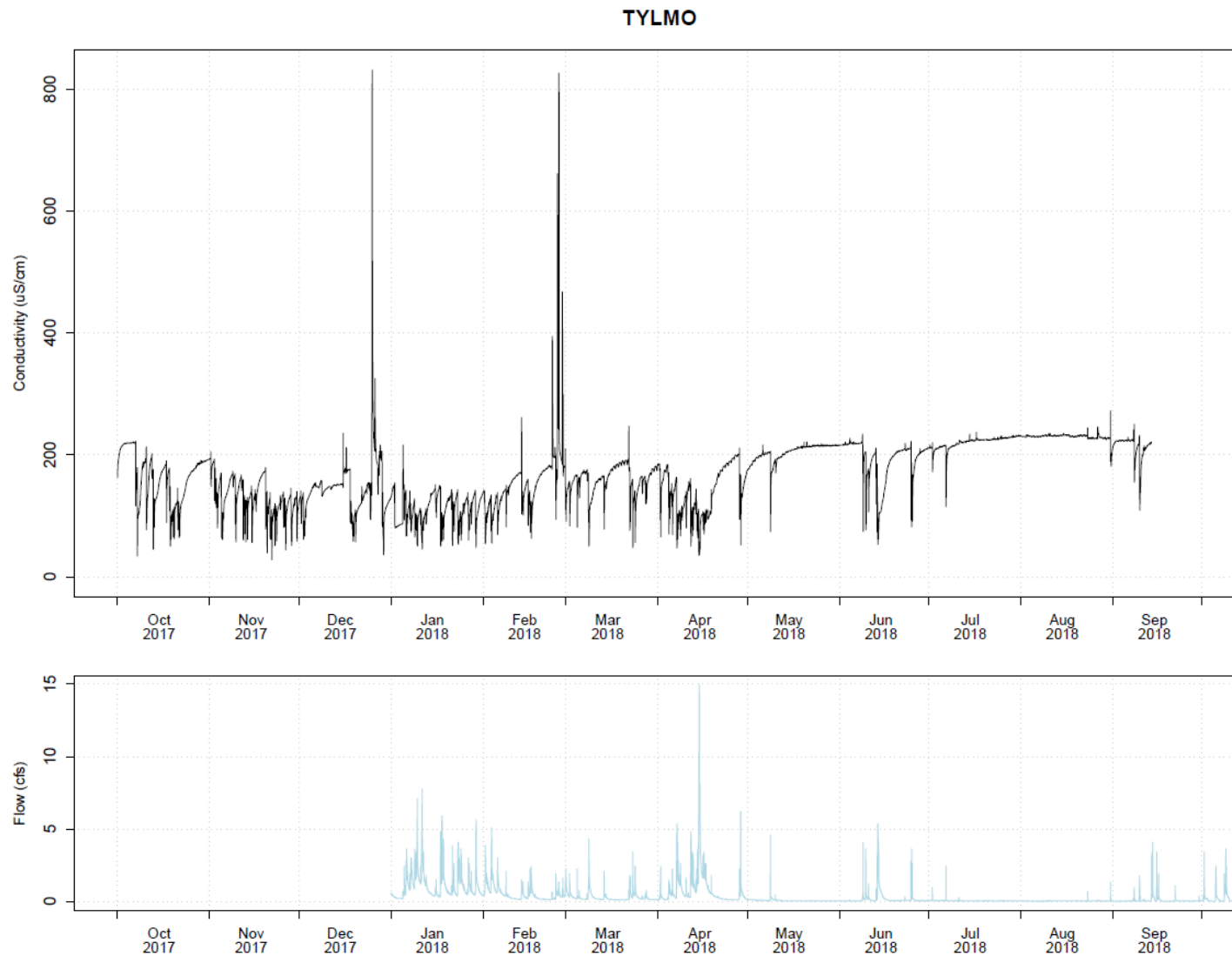


Figure K-9. Continuous Conductivity Measured at the TYLMO Station.

APPENDIX L

Compiled Field Data from Physical Habitat Monitoring

The contents of this appendix are provided in an electronic file only.

APPENDIX M

Computed Physical Habitat Quality Indicators

The contents of this appendix are provided in an electronic file only.

APPENDIX N

Summary Statistics for Evaluating Physical Habitat Quality Indicators

The contents of this appendix are provided in an electronic file only.

APPENDIX O

Laboratory Reports and Data Quality Assurance Audit Forms for Sediment Quality Monitoring



14648 NE 95th Street, Redmond, WA 98052 • (425) 883-3881

October 10, 2018

John Lenth
Herrera Environmental Consultants, Inc.
2200 6th Avenue, Suite 1100
Seattle, WA 98121

Re: Analytical Data for Project 14-05806-000
Laboratory Reference No. 1807-035

Dear John:

Enclosed are the analytical results and associated quality control data for samples submitted on July 6, 2018.

The standard policy of OnSite Environmental, Inc. is to store your samples for 30 days from the date of receipt. If you require longer storage, please contact the laboratory.

We appreciate the opportunity to be of service to you on this project. If you have any questions concerning the data, or need additional information, please feel free to call me.

Sincerely,

A handwritten signature in black ink, appearing to read "DB", with a long horizontal stroke extending to the right.

David Baumeister
Project Manager

Enclosures



OnSite Environmental, Inc. 14648 NE 95th Street, Redmond, WA 98052 (425) 883-3881

This report pertains to the samples analyzed in accordance with the chain of custody, and is intended only for the use of the individual or company to whom it is addressed.

Date of Report: October 10, 2018
Samples Submitted: July 6, 2018
Laboratory Reference: 1807-035
Project: 14-05806-000

Case Narrative

Samples were collected on July 5 and 6, 2018 and received by the laboratory on July 6, 2018. They were maintained at the laboratory at a temperature of 2°C to 6°C.

Please note that any and all soil sample results are reported on a dry-weight basis, unless otherwise noted below.

General QA/QC issues associated with the analytical data enclosed in this laboratory report will be indicated with a reference to a comment or explanation on the Data Qualifier page. More complex and involved QA/QC issues will be discussed in detail below.

Total Solids SM 2540G

The duplicate RPD for Total Solids, effecting samples COLIN - IM-2018 and MONT-SM-2018, is outside control limits due to sample inhomogeneity.

Any other QA/QC issues associated with this extraction and analysis will be indicated with a footnote reference and discussed in detail on the Data Qualifier page.



Date of Report: October 10, 2018
 Samples Submitted: July 6, 2018
 Laboratory Reference: 1807-035
 Project: 14-05806-000

**TOTAL METALS
 EPA 6010D**

Matrix: Sediment
 Units: mg/Kg (ppm)

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|-------------------|------------------------|-----|-----------|---------------|---------------|-------|
| Client ID: | COLIN - IM-2018 | | | | | |
| Laboratory ID: | 07-035-02 | | | | | |
| Copper | 21 | 5.4 | EPA 6010D | 10-3-18 | 10-4-18 | |
| Zinc | 94 | 13 | EPA 6010D | 10-3-18 | 10-4-18 | |

| | | | | | | |
|-------------------|---------------------|-----|-----------|---------|---------|--|
| Client ID: | MONT-SM-2018 | | | | | |
| Laboratory ID: | 07-035-04 | | | | | |
| Copper | 39 | 5.5 | EPA 6010D | 10-3-18 | 10-4-18 | |
| Zinc | 250 | 14 | EPA 6010D | 10-3-18 | 10-4-18 | |



Date of Report: October 10, 2018
 Samples Submitted: July 6, 2018
 Laboratory Reference: 1807-035
 Project: 14-05806-000

**TOTAL METALS
 EPA 6010D
 QUALITY CONTROL**

Matrix: Sediment
 Units: mg/Kg (ppm)

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|---------------------|-----------|-----|-----------|---------------|---------------|-------|
| METHOD BLANK | | | | | | |
| Laboratory ID: | MB1003SM4 | | | | | |
| Copper | ND | 1.0 | EPA 6010D | 10-3-18 | 10-3-18 | |
| Zinc | ND | 2.5 | EPA 6010D | 10-3-18 | 10-3-18 | |

| Analyte | Result | Spike Level | Source Result | Percent Recovery | Recovery Limits | RPD | RPD Limit | Flags |
|------------------|-----------|-------------|---------------|------------------|-----------------|-----|-----------|-------|
| DUPLICATE | | | | | | | | |
| Laboratory ID: | 08-051-01 | | | | | | | |
| | ORIG | DUP | | | | | | |
| Copper | 8.90 | 8.75 | NA | NA | NA | NA | 2 | 20 |
| Zinc | 65.3 | 65.0 | NA | NA | NA | NA | 0 | 20 |

MATRIX SPIKES

| Laboratory ID: | MS | MSD | MS | MSD | MS | MSD | MS | MSD | RPD | RPD Limit | |
|----------------|-----------|------|------|------|------|-----|-----|--------|-----|-----------|--|
| Laboratory ID: | 08-051-01 | | | | | | | | | | |
| | MS | MSD | MS | MSD | MS | MSD | MS | MSD | | | |
| Copper | 60.1 | 59.9 | 50.0 | 50.0 | 8.90 | 102 | 102 | 75-125 | 0 | 20 | |
| Zinc | 164 | 163 | 100 | 100 | 65.3 | 99 | 98 | 75-125 | 1 | 20 | |



Date of Report: October 10, 2018
 Samples Submitted: July 6, 2018
 Laboratory Reference: 1807-035
 Project: 14-05806-000

SEMIVOLATILES EPA 8270D/SIM

Matrix: Sediment
 Units: mg/Kg

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|-----------------------------|-------------------------|-----------------------|---------------|---------------|---------------|-------|
| Client ID: | COLIN - IR-2018 | | | | | |
| Laboratory ID: | 07-035-01 | | | | | |
| Naphthalene | ND | 0.0065 | EPA 8270D/SIM | 7-19-18 | 7-19-18 | |
| 2-Methylnaphthalene | ND | 0.0065 | EPA 8270D/SIM | 7-19-18 | 7-19-18 | |
| 1-Methylnaphthalene | ND | 0.0065 | EPA 8270D/SIM | 7-19-18 | 7-19-18 | |
| Dimethylphthalate | ND | 0.032 | EPA 8270D | 7-19-18 | 7-19-18 | |
| Acenaphthylene | ND | 0.0065 | EPA 8270D/SIM | 7-19-18 | 7-19-18 | |
| Acenaphthene | ND | 0.0065 | EPA 8270D/SIM | 7-19-18 | 7-19-18 | |
| Diethylphthalate | ND | 0.16 | EPA 8270D | 7-19-18 | 7-19-18 | |
| Fluorene | ND | 0.0065 | EPA 8270D/SIM | 7-19-18 | 7-19-18 | |
| Phenanthrene | ND | 0.0065 | EPA 8270D/SIM | 7-19-18 | 7-19-18 | |
| Anthracene | ND | 0.0065 | EPA 8270D/SIM | 7-19-18 | 7-19-18 | |
| Di-n-butylphthalate | ND | 0.16 | EPA 8270D | 7-19-18 | 7-19-18 | |
| Fluoranthene | ND | 0.0065 | EPA 8270D/SIM | 7-19-18 | 7-19-18 | |
| Pyrene | ND | 0.0065 | EPA 8270D/SIM | 7-19-18 | 7-19-18 | |
| Butylbenzylphthalate | ND | 0.16 | EPA 8270D | 7-19-18 | 7-19-18 | |
| Benzo[a]anthracene | ND | 0.0065 | EPA 8270D/SIM | 7-19-18 | 7-19-18 | |
| Chrysene | ND | 0.0065 | EPA 8270D/SIM | 7-19-18 | 7-19-18 | |
| bis(2-Ethylhexyl)phthalate | ND | 0.16 | EPA 8270D | 7-19-18 | 7-19-18 | |
| Di-n-octylphthalate | ND | 0.16 | EPA 8270D | 7-19-18 | 7-19-18 | |
| Benzo[b]fluoranthene | ND | 0.0065 | EPA 8270D/SIM | 7-19-18 | 7-19-18 | |
| Benzo(j,k)fluoranthene | ND | 0.0065 | EPA 8270D/SIM | 7-19-18 | 7-19-18 | |
| Benzo[a]pyrene | ND | 0.0065 | EPA 8270D/SIM | 7-19-18 | 7-19-18 | |
| Indeno[1,2,3-cd]pyrene | ND | 0.0065 | EPA 8270D/SIM | 7-19-18 | 7-19-18 | |
| Dibenz[a,h]anthracene | ND | 0.0065 | EPA 8270D/SIM | 7-19-18 | 7-19-18 | |
| Benzo[g,h,i]perylene | ND | 0.0065 | EPA 8270D/SIM | 7-19-18 | 7-19-18 | |
| <i>Surrogate:</i> | <i>Percent Recovery</i> | <i>Control Limits</i> | | | | |
| <i>2-Fluorophenol</i> | <i>53</i> | <i>19 - 103</i> | | | | |
| <i>Phenol-d6</i> | <i>64</i> | <i>30 - 103</i> | | | | |
| <i>Nitrobenzene-d5</i> | <i>67</i> | <i>27 - 105</i> | | | | |
| <i>2-Fluorobiphenyl</i> | <i>65</i> | <i>36 - 102</i> | | | | |
| <i>2,4,6-Tribromophenol</i> | <i>82</i> | <i>33 - 110</i> | | | | |
| <i>Terphenyl-d14</i> | <i>71</i> | <i>38 - 108</i> | | | | |



Date of Report: October 10, 2018
 Samples Submitted: July 6, 2018
 Laboratory Reference: 1807-035
 Project: 14-05806-000

SEMIVOLATILES EPA 8270D/SIM

Matrix: Sediment
 Units: mg/Kg

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|-----------------------------|-------------------------|-----------------------|---------------|---------------|---------------|-------|
| Client ID: | MONT-SR-2018 | | | | | |
| Laboratory ID: | 07-035-03 | | | | | |
| Naphthalene | ND | 0.0077 | EPA 8270D/SIM | 7-19-18 | 7-19-18 | |
| 2-Methylnaphthalene | ND | 0.0077 | EPA 8270D/SIM | 7-19-18 | 7-19-18 | |
| 1-Methylnaphthalene | ND | 0.0077 | EPA 8270D/SIM | 7-19-18 | 7-19-18 | |
| Dimethylphthalate | ND | 0.038 | EPA 8270D | 7-19-18 | 7-19-18 | |
| Acenaphthylene | ND | 0.0077 | EPA 8270D/SIM | 7-19-18 | 7-19-18 | |
| Acenaphthene | ND | 0.0077 | EPA 8270D/SIM | 7-19-18 | 7-19-18 | |
| Diethylphthalate | ND | 0.19 | EPA 8270D | 7-19-18 | 7-19-18 | |
| Fluorene | ND | 0.0077 | EPA 8270D/SIM | 7-19-18 | 7-19-18 | |
| Phenanthrene | ND | 0.0077 | EPA 8270D/SIM | 7-19-18 | 7-19-18 | |
| Anthracene | ND | 0.0077 | EPA 8270D/SIM | 7-19-18 | 7-19-18 | |
| Di-n-butylphthalate | ND | 0.19 | EPA 8270D | 7-19-18 | 7-19-18 | |
| Fluoranthene | ND | 0.0077 | EPA 8270D/SIM | 7-19-18 | 7-19-18 | |
| Pyrene | ND | 0.0077 | EPA 8270D/SIM | 7-19-18 | 7-19-18 | |
| Butylbenzylphthalate | ND | 0.19 | EPA 8270D | 7-19-18 | 7-19-18 | |
| Benzo[a]anthracene | ND | 0.0077 | EPA 8270D/SIM | 7-19-18 | 7-19-18 | |
| Chrysene | ND | 0.0077 | EPA 8270D/SIM | 7-19-18 | 7-19-18 | |
| bis(2-Ethylhexyl)phthalate | ND | 0.19 | EPA 8270D | 7-19-18 | 7-19-18 | |
| Di-n-octylphthalate | ND | 0.19 | EPA 8270D | 7-19-18 | 7-19-18 | |
| Benzo[b]fluoranthene | ND | 0.0077 | EPA 8270D/SIM | 7-19-18 | 7-19-18 | |
| Benzo(j,k)fluoranthene | ND | 0.0077 | EPA 8270D/SIM | 7-19-18 | 7-19-18 | |
| Benzo[a]pyrene | ND | 0.0077 | EPA 8270D/SIM | 7-19-18 | 7-19-18 | |
| Indeno[1,2,3-cd]pyrene | ND | 0.0077 | EPA 8270D/SIM | 7-19-18 | 7-19-18 | |
| Dibenz[a,h]anthracene | ND | 0.0077 | EPA 8270D/SIM | 7-19-18 | 7-19-18 | |
| Benzo[g,h,i]perylene | ND | 0.0077 | EPA 8270D/SIM | 7-19-18 | 7-19-18 | |
| <i>Surrogate:</i> | <i>Percent Recovery</i> | <i>Control Limits</i> | | | | |
| <i>2-Fluorophenol</i> | <i>44</i> | <i>19 - 103</i> | | | | |
| <i>Phenol-d6</i> | <i>57</i> | <i>30 - 103</i> | | | | |
| <i>Nitrobenzene-d5</i> | <i>58</i> | <i>27 - 105</i> | | | | |
| <i>2-Fluorobiphenyl</i> | <i>58</i> | <i>36 - 102</i> | | | | |
| <i>2,4,6-Tribromophenol</i> | <i>79</i> | <i>33 - 110</i> | | | | |
| <i>Terphenyl-d14</i> | <i>67</i> | <i>38 - 108</i> | | | | |



Date of Report: October 10, 2018
 Samples Submitted: July 6, 2018
 Laboratory Reference: 1807-035
 Project: 14-05806-000

**SEMIVOLATILES EPA 8270D/SIM
 METHOD BLANK QUALITY CONTROL**

Matrix: Sediment
 Units: mg/Kg

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|-----------------------------|-------------------------|-----------------------|---------------|---------------|---------------|-------|
| Laboratory ID: | MB0719S1 | | | | | |
| Naphthalene | ND | 0.0040 | EPA 8270D/SIM | 7-19-18 | 7-19-18 | |
| 2-Methylnaphthalene | ND | 0.0040 | EPA 8270D/SIM | 7-19-18 | 7-19-18 | |
| 1-Methylnaphthalene | ND | 0.0040 | EPA 8270D/SIM | 7-19-18 | 7-19-18 | |
| Dimethylphthalate | ND | 0.020 | EPA 8270D | 7-19-18 | 7-19-18 | |
| Acenaphthylene | ND | 0.0040 | EPA 8270D/SIM | 7-19-18 | 7-19-18 | |
| Acenaphthene | ND | 0.0040 | EPA 8270D/SIM | 7-19-18 | 7-19-18 | |
| Diethylphthalate | ND | 0.10 | EPA 8270D | 7-19-18 | 7-19-18 | |
| Fluorene | ND | 0.0040 | EPA 8270D/SIM | 7-19-18 | 7-19-18 | |
| Phenanthrene | ND | 0.0040 | EPA 8270D/SIM | 7-19-18 | 7-19-18 | |
| Anthracene | ND | 0.0040 | EPA 8270D/SIM | 7-19-18 | 7-19-18 | |
| Di-n-butylphthalate | ND | 0.10 | EPA 8270D | 7-19-18 | 7-19-18 | |
| Fluoranthene | ND | 0.0040 | EPA 8270D/SIM | 7-19-18 | 7-19-18 | |
| Pyrene | ND | 0.0040 | EPA 8270D/SIM | 7-19-18 | 7-19-18 | |
| Butylbenzylphthalate | ND | 0.10 | EPA 8270D | 7-19-18 | 7-19-18 | |
| Benzo[a]anthracene | ND | 0.0040 | EPA 8270D/SIM | 7-19-18 | 7-19-18 | |
| Chrysene | ND | 0.0040 | EPA 8270D/SIM | 7-19-18 | 7-19-18 | |
| bis(2-Ethylhexyl)phthalate | ND | 0.10 | EPA 8270D | 7-19-18 | 7-19-18 | |
| Di-n-octylphthalate | ND | 0.10 | EPA 8270D | 7-19-18 | 7-19-18 | |
| Benzo[b]fluoranthene | ND | 0.0040 | EPA 8270D/SIM | 7-19-18 | 7-19-18 | |
| Benzo[j,k]fluoranthene | ND | 0.0040 | EPA 8270D/SIM | 7-19-18 | 7-19-18 | |
| Benzo[a]pyrene | ND | 0.0040 | EPA 8270D/SIM | 7-19-18 | 7-19-18 | |
| Indeno[1,2,3-cd]pyrene | ND | 0.0040 | EPA 8270D/SIM | 7-19-18 | 7-19-18 | |
| Dibenz[a,h]anthracene | ND | 0.0040 | EPA 8270D/SIM | 7-19-18 | 7-19-18 | |
| Benzo[g,h,i]perylene | ND | 0.0040 | EPA 8270D/SIM | 7-19-18 | 7-19-18 | |
| <i>Surrogate:</i> | <i>Percent Recovery</i> | <i>Control Limits</i> | | | | |
| <i>2-Fluorophenol</i> | <i>58</i> | <i>19 - 103</i> | | | | |
| <i>Phenol-d6</i> | <i>67</i> | <i>30 - 103</i> | | | | |
| <i>Nitrobenzene-d5</i> | <i>73</i> | <i>27 - 105</i> | | | | |
| <i>2-Fluorobiphenyl</i> | <i>65</i> | <i>36 - 102</i> | | | | |
| <i>2,4,6-Tribromophenol</i> | <i>77</i> | <i>33 - 110</i> | | | | |
| <i>Terphenyl-d14</i> | <i>69</i> | <i>38 - 108</i> | | | | |



Date of Report: October 10, 2018
 Samples Submitted: July 6, 2018
 Laboratory Reference: 1807-035
 Project: 14-05806-000

**SEMIVOLATILES EPA 8270D/SIM
 SB/SBD QUALITY CONTROL**

Matrix: Sediment
 Units: mg/Kg

| Analyte | Result | | Spike Level | | Percent Recovery | | Recovery | RPD | RPD | Flags |
|----------------------------|----------|-------|-------------|-------|------------------|--------|----------|-------|-----|-------|
| | | | | | Recovery | Limits | Limits | Limit | | |
| SPIKE BLANKS | | | | | | | | | | |
| Laboratory ID: | SB0719S1 | | | | | | | | | |
| | SB | SBD | SB | SBD | SB | SBD | | | | |
| Phenol | 0.555 | 0.530 | 0.800 | 0.800 | 69 | 66 | 45 - 94 | 5 | 29 | |
| 2-Chlorophenol | 0.569 | 0.538 | 0.800 | 0.800 | 71 | 67 | 46 - 94 | 6 | 33 | |
| 1,4-Dichlorobenzene | 0.258 | 0.245 | 0.400 | 0.400 | 65 | 61 | 42 - 91 | 5 | 37 | |
| n-Nitroso-di-n-propylamine | 0.356 | 0.345 | 0.400 | 0.400 | 89 | 86 | 45 - 100 | 3 | 26 | |
| 1,2,4-Trichlorobenzene | 0.266 | 0.257 | 0.400 | 0.400 | 67 | 64 | 45 - 92 | 3 | 32 | |
| 4-Chloro-3-methylphenol | 0.602 | 0.588 | 0.800 | 0.800 | 75 | 74 | 55 - 97 | 2 | 21 | |
| Acenaphthene | 0.276 | 0.269 | 0.400 | 0.400 | 69 | 67 | 48 - 91 | 3 | 21 | |
| 4-Nitrophenol | 0.671 | 0.702 | 0.800 | 0.800 | 84 | 88 | 53 - 102 | 5 | 20 | |
| 2,4-Dinitrotoluene | 0.255 | 0.252 | 0.400 | 0.400 | 64 | 63 | 47 - 96 | 1 | 19 | |
| Pentachlorophenol | 0.495 | 0.581 | 0.800 | 0.800 | 62 | 73 | 35 - 118 | 16 | 26 | |
| Pyrene | 0.281 | 0.289 | 0.400 | 0.400 | 70 | 72 | 55 - 95 | 3 | 17 | |
| <i>Surrogate:</i> | | | | | | | | | | |
| 2-Fluorophenol | | | | | 58 | 56 | 19 - 103 | | | |
| Phenol-d6 | | | | | 66 | 65 | 30 - 103 | | | |
| Nitrobenzene-d5 | | | | | 72 | 72 | 27 - 105 | | | |
| 2-Fluorobiphenyl | | | | | 63 | 62 | 36 - 102 | | | |
| 2,4,6-Tribromophenol | | | | | 78 | 78 | 33 - 110 | | | |
| Terphenyl-d14 | | | | | 67 | 69 | 38 - 108 | | | |



Date of Report: October 10, 2018
 Samples Submitted: July 6, 2018
 Laboratory Reference: 1807-035
 Project: 14-05806-000

**TOTAL SOLIDS
 SM 2540G**

Matrix: Sediment
 Units: % Solids

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|-------------------|------------------------|------|----------|---------------|---------------|-------|
| Client ID: | COLIN - IR-2018 | | | | | |
| Laboratory ID: | 07-035-01 | | | | | |
| Total Solids | 62 | 0.50 | SM 2540G | 7-9-18 | 7-12-18 | |

| | | | | | | |
|-------------------|------------------------|------|----------|---------|---------|--|
| Client ID: | COLIN - IM-2018 | | | | | |
| Laboratory ID: | 07-035-02 | | | | | |
| Total Solids | 19 | 0.50 | SM 2540G | 10-5-18 | 10-8-18 | |

| | | | | | | |
|-------------------|---------------------|------|----------|--------|---------|--|
| Client ID: | MONT-SR-2018 | | | | | |
| Laboratory ID: | 07-035-03 | | | | | |
| Total Solids | 52 | 0.50 | SM 2540G | 7-9-18 | 7-12-18 | |

| | | | | | | |
|-------------------|---------------------|------|----------|---------|---------|--|
| Client ID: | MONT-SM-2018 | | | | | |
| Laboratory ID: | 07-035-04 | | | | | |
| Total Solids | 18 | 0.50 | SM 2540G | 10-5-18 | 10-8-18 | |



Date of Report: October 10, 2018
 Samples Submitted: July 6, 2018
 Laboratory Reference: 1807-035
 Project: 14-05806-000

**TOTAL SOLIDS
 SM 2540G
 QUALITY CONTROL**

Matrix: Sediment
 Units: % Solids

| Analyte | Result | | Spike Level | Source Result | Percent Recovery | Recovery Limits | RPD | RPD Limit | Flags |
|------------------|---------------|-------------|--------------------|----------------------|-------------------------|------------------------|------------|------------------|--------------|
| DUPLICATE | | | | | | | | | |
| Laboratory ID: | 08-260-05 | | | | | | | | |
| | ORIG | DUP | | | | | | | |
| Total Solids | 31.6 | 44.3 | NA | NA | NA | NA | 33 | 20 | |





Data Qualifiers and Abbreviations

- A - Due to a high sample concentration, the amount spiked is insufficient for meaningful MS/MSD recovery data.
 - B - The analyte indicated was also found in the blank sample.
 - C - The duplicate RPD is outside control limits due to high result variability when analyte concentrations are within five times the quantitation limit.
 - E - The value reported exceeds the quantitation range and is an estimate.
 - F - Surrogate recovery data is not available due to the high concentration of coeluting target compounds.
 - H - The analyte indicated is a common laboratory solvent and may have been introduced during sample preparation, and be impacting the sample result.
 - I - Compound recovery is outside of the control limits.
 - J - The value reported was below the practical quantitation limit. The value is an estimate.
 - K - Sample duplicate RPD is outside control limits due to sample inhomogeneity. The sample was re-extracted and re-analyzed with similar results.
 - L - The RPD is outside of the control limits.
 - M - Hydrocarbons in the gasoline range are impacting the diesel range result.
 - M1 - Hydrocarbons in the gasoline range (toluene-naphthalene) are present in the sample.
 - N - Hydrocarbons in the lube oil range are impacting the diesel range result.
 - N1 - Hydrocarbons in diesel range are impacting lube oil range results.
 - O - Hydrocarbons indicative of heavier fuels are present in the sample and are impacting the gasoline result.
 - P - The RPD of the detected concentrations between the two columns is greater than 40.
 - Q - Surrogate recovery is outside of the control limits.
 - S - Surrogate recovery data is not available due to the necessary dilution of the sample.
 - T - The sample chromatogram is not similar to a typical _____.
 - U - The analyte was analyzed for, but was not detected above the reported sample quantitation limit.
 - U1 - The practical quantitation limit is elevated due to interferences present in the sample.
 - V - Matrix Spike/Matrix Spike Duplicate recoveries are outside control limits due to matrix effects.
 - W - Matrix Spike/Matrix Spike Duplicate RPD are outside control limits due to matrix effects.
 - X - Sample extract treated with a mercury cleanup procedure.
 - X1 - Sample extract treated with a sulfuric acid/silica gel cleanup procedure.
 - Y - The calibration verification for this analyte exceeded the 20% drift specified in method 8260C, and therefore the reported result should be considered an estimate. The overall performance of the calibration verification standard met the acceptance criteria of the method.
 - Z -
- ND - Not Detected at PQL
 PQL - Practical Quantitation Limit
 RPD - Relative Percent Difference





Am Test Inc.
13600 NE 126TH PL
Suite C
Kirkland, WA 98034
(425) 885-1664

Professional
Analytical
Services

Aug 8 2018
On-Site Environmental
14648 NE 95th ST
Redmond, WA 98052
Attention: David Baumeister

Dear David Baumeister:

Enclosed please find the analytical data for your REDMOND PAIRED WATERSHED STUDY project.

The following is a cross correlation of client and laboratory identifications for your convenience.

| CLIENT ID | MATRIX | AMTEST ID | TEST |
|---------------|--------|------------|------|
| COLIN-1R-2018 | Soil | 18-A012728 | DEM |
| MONT-5R-2018 | Soil | 18-A012729 | DEM |

Your samples were received on Friday, July 27, 2018. At the time of receipt, the samples were logged in and properly maintained prior to the subsequent analysis.

The analytical procedures used at AmTest are well documented and are typically derived from the protocols of the EPA, USDA, FDA or the Army Corps of Engineers.

Following the analytical data you will find the Quality Control (QC) results.

Please note that the detection limits that are listed in the body of the report refer to the Practical Quantitation Limits (PQL's), as opposed to the Method Detection Limits (MDL's).

If you should have any questions pertaining to the data package, please feel free to contact me.

Sincerely,


Aaron W. Young
Laboratory Manager

Project #: 14-05806-000
PO Number: 07-035

BACT = Bacteriological
CONV = Conventionals

MET = Metals
ORG = Organics

NUT=Nutrients
DEM=Demand

MIN=Minerals

Am Test Inc.
13600 NE 126TH PL
Suite C
Kirkland, WA 98034
(425) 885-1664
www.amtestlab.com



Professional
Analytical
Services

ANALYSIS REPORT

On-Site Environmental
14648 NE 95th ST
Redmond, WA 98052
Attention: David Baumeister
Project Name: REDMOND PAIRED WATERSHED STUDY
Project #: 14-05806-000
PO Number: 07-035
All results reported on an as received basis.

Date Received: 07/27/18
Date Reported: 8/ 8/18

AMTEST Identification Number 18-A012728
Client Identification COLIN-1R-2018
Sampling Date 07/05/18, 12:10


Demand

| PARAMETER | RESULT | UNITS | Q | D.L. | METHOD | ANALYST | DATE |
|----------------------|--------|-------|---|------|-------------|---------|----------|
| Total Organic Carbon | 1.3 | % | | 0.05 | SW 846 9060 | MJ | 08/01/18 |

AMTEST Identification Number 18-A012729
Client Identification MONT-5R-2018
Sampling Date 07/06/18, 11:55

Demand

| PARAMETER | RESULT | UNITS | Q | D.L. | METHOD | ANALYST | DATE |
|----------------------|--------|-------|---|------|-------------|---------|----------|
| Total Organic Carbon | 1.9 | % | | 0.05 | SW 846 9060 | MJ | 08/01/18 |


Aaron W. Young
Laboratory Manager

QC Summary for sample numbers: 18-A012728 to 18-A012729

DUPLICATES

| SAMPLE # | ANALYTE | UNITS | SAMPLE VALUE | DUP VALUE | RPD |
|------------|----------------------|-------|--------------|-----------|-----|
| 18-A011919 | Total Organic Carbon | % | 0.67 | 0.81 | 19. |
| 18-A011929 | Total Organic Carbon | % | 0.34 | 0.43 | 23. |
| 18-A011933 | Total Organic Carbon | % | 0.42 | 0.47 | 11. |

STANDARD REFERENCE MATERIALS

| ANALYTE | UNITS | TRUE VALUE | MEASURED VALUE | RECOVERY |
|----------------------|-------|------------|----------------|----------|
| Total Organic Carbon | % | 0.56 | 0.64 | 114. % |
| Total Organic Carbon | % | 0.56 | 0.69 | 123. % |

BLANKS

| ANALYTE | UNITS | RESULT |
|----------------------|-------|--------|
| Total Organic Carbon | % | < 0.05 |



14648 NE 95th Street, Redmond, WA 98052 · (425) 883-3881

Laboratory: AmTest Laboratories

Attention: Aaron Young

13600 NE 126th PI Kirkland, WA 98034

Phone Number: (425) 885-1664

Turnaround Request

1 Day 2 Day 3 Day

Standard

Other: _____

Laboratory Reference #: 07-035

Project Manager: David Baumeister

email: dbaumeister@onsite-env.com

Project Number: 14-05806-000

Project Name: Redmond Paired Watershed Study

| Lab ID | Sample Identification | Date Sampled | Time Sampled | Matrix | # of Cont. | Requested Analyses |
|------------------|-------------------------|--------------|--------------|-------------------------------|------------|--------------------|
| 1 | COLIN-1R-2018 12728 | 7/5/18 | 12:10 | Sediment | 1 | TCC EPA 9060A |
| 3 | MONT-5R-2018 29 | 7/6/18 | 11:55 | Sediment | 1 | TCC EPA 9060A |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| Signature | Company | Date | Time | Comments/Special Instructions | | |
| Relinquished by: | OnSite Inc | 7/27/18 | 11:45 | | | |
| Received by: | AMTEST T=13.6 | 7/27/18 | 11:45 | | | |
| Relinquished by: | | | | | | |
| Received by: | | | | | | |
| Relinquished by: | | | | | | |
| Received by: | | | | | | |



14648 NE 95th Street, Redmond, WA 98052
Telephone: 425.883.3881

Company: Herrera Environmental Consultants
Project No.: 14-05806-000
Project Name: Redmond Paired Watershed Study
Project Manager: John Lenth

CHAIN OF CUSTODY

Turnaround Requested:
 _____ 1 Day
 _____ 2 Day
 _____ 3 Day
 Standard

Laboratory No. **07-035**
 Requested Analyses

| | | | | | | | | | | | | | | | | | | | | | |
|----------------------|--------|------|----------------------------------|------------|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|------------------------|
| Total Organic Carbon | Copper | Zinc | Polycyclic aromatic hydrocarbons | Phthalates | | | | | | | | | | | | | | | | | NO MATTER TOTAL SOLIDS |
|----------------------|--------|------|----------------------------------|------------|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|------------------------|

| Lab ID | Sample Identification | Date Sampled | Time Sampled | Matrix | # of Cont. | Total Organic Carbon | Copper | Zinc | Polycyclic aromatic hydrocarbons | Phthalates | | | | | | | | | | | | |
|--------|-----------------------|--------------|--------------|----------|------------|----------------------|--------|------|----------------------------------|------------|--|--|--|--|--|--|--|--|--|--|--|---|
| 1 | COLIN-1R-2018 | 7.5.18 | 12:10 | Sediment | 1 | X | | | X | X | | | | | | | | | | | | X |
| 2 | COLIN-1M-2018 | 7.5.18 | 12:10 | Sediment | 1 | | X | X | | | | | | | | | | | | | | ↓ |
| 3 | MONT-SR-2018 | 7.6.18 | 11:55 | Sediment | 1 | X | | | X | X | | | | | | | | | | | | ↓ |
| 4 | MONT-SM-2018 | 7.6.18 | 11:55 | Sediment | 1 | | X | X | | | | | | | | | | | | | | ↓ |
| | | | | Sediment | 1 | | | | | | | | | | | | | | | | | |
| | | | | Sediment | 1 | | | | | | | | | | | | | | | | | |
| | | | | Sediment | 1 | | | | | | | | | | | | | | | | | |
| | | | | Sediment | 1 | | | | | | | | | | | | | | | | | |
| | | | | Sediment | 1 | | | | | | | | | | | | | | | | | |
| | | | | Sediment | 1 | | | | | | | | | | | | | | | | | |
| | | | | Sediment | 1 | | | | | | | | | | | | | | | | | |
| | | | | Sediment | 1 | | | | | | | | | | | | | | | | | |
| | | | | Sediment | 1 | | | | | | | | | | | | | | | | | |
| | | | | Sediment | 1 | | | | | | | | | | | | | | | | | |
| | | | | Sediment | 1 | | | | | | | | | | | | | | | | | |

Relinquished by Miriam Hernandez Date 7/6/18 Received by [Signature] Date 7/6/18
 Firm Herrera Time 1550 Firm OSE Time 1550
 Relinquished by _____ Date _____ Received by _____ Date _____
 Firm _____ Time _____ Firm _____ Time _____

Comments:



Data Quality Assurance Worksheet

Project Name/No./Client: Redmond Paired Watershed Study / 14-05806-000 / City of Redmond
 Laboratory/Parameters: OnSite Environmental : TOC, Cu, Zn, PAHs, phthalates (TOC subbed to AmTest)
 Sample Date/Sample ID: 7/5 - 6/2018 / COLIN-1, MONT-5

By G. Catarra
 Date 10/17/2018 Page 1 of 1
 Checked: initials JL
 date 10/18/2018

| Parameter | Completeness/ Methodology | Pre-extraction Holding Times (minutes) | | Total Holding Times (days) | | Method Blanks Reporting Limit | Matrix Spikes/ Surrogate Recovery (%) | | Lab Control Samples Recovery (%) | | Lab Duplicates RPD (%) | | Field Duplicates RPD (%) | | Instrument Calibration/ Performance | ACTION |
|------------|------------------------------|--|------|-------------------------------|------|--|---|--------------------|--|------------|---------------------------|-------------------|-----------------------------|-------------------|---|---|
| | | Reported | Goal | Reported | Goal | | Reported | Goal | Reported | Goal | Reported | Goal ¹ | Reported | Goal ¹ | | |
| TOC | OK / EPA 9060A | NA | NA | 26-27 | ≤14 | ≤0.05% 0.05 % | NA | NA | 114,123 | ±20 | Batch 23 | ≤20 | NS | ≤35 | OK | NONE. EPA HOLDING TIME 28 DAYS NO FLAG, BATCH SAMPLE |
| Copper | OK / EPA 6020 | NA | NA | 91-92 | ≤180 | ≤1.0 MG/KG 1.0 MG/KG | 102,102 | ±25 | NR | ±15 | 2 | ≤20 | NS | ≤35 | OK | NONE |
| Zinc | OK / EPA 6020 | NA | NA | 91-92 | ≤180 | ≤2.5 mg/kg 2.5 MG/KG | 99,98 | ±25 | NR | ±15 | 0 | ≤20 | NS | ≤35 | OK | NONE |
| PAHs | OK / EPA 8270D/SIM | 8 | ≤14 | 14-15 | ≤40 | ≤20 ug/kg 16-20 UG/KG | NR | NA / 21- 120 | 61-89 | 25- 141 | BS/BSD 1-16 | ≤40 | NS | ≤50 | OK | NONE |
| Phthalates | OK / EPA 8270D | 8 | ≤14 | 14-15 | ≤40 | ≤0.1 MG/KG 2-2.5 MG/KG | NR | NA / 21- 120 | 61-89 | 25- 141 | BS/BSD 1-16 | ≤40 | NS | ≤50 | OK | NONE |

¹ If the sample or duplicate value is less than five times the reporting limit, the difference is calculated rather than the relative percent difference (RPD). The QA goal is a difference <2 times the detection limit instead of the number indicated in the goal column.

NA – not applicable or not available; NC – not calculable due to one or more values below the detection limit; NS – field duplicate not sampled.



**OnSite
Environmental Inc.**

14648 NE 95th Street, Redmond, WA 98052 • (425) 883-3881

October 10, 2018

John Lenth
Herrera Environmental Consultants, Inc.
2200 6th Avenue, Suite 1100
Seattle, WA 98121

Re: Analytical Data for Project 14-05806-000
Laboratory Reference No. 1807-140

Dear John:

Enclosed are the analytical results and associated quality control data for samples submitted on July 20, 2018.

The standard policy of OnSite Environmental, Inc. is to store your samples for 30 days from the date of receipt. If you require longer storage, please contact the laboratory.

We appreciate the opportunity to be of service to you on this project. If you have any questions concerning the data, or need additional information, please feel free to call me.

Sincerely,

Blair Goodrow
Project Manager

Enclosures



OnSite Environmental, Inc. 14648 NE 95th Street, Redmond, WA 98052 (425) 883-3881

This report pertains to the samples analyzed in accordance with the chain of custody,
and is intended only for the use of the individual or company to whom it is addressed.

Date of Report: October 10, 2018
Samples Submitted: July 20, 2018
Laboratory Reference: 1807-140
Project: 14-05806-000

Case Narrative

Samples were collected on July 13, 16, and 20, 2018 and received by the laboratory on July 20, 2018. They were maintained at the laboratory at a temperature of 2°C to 6°C.

Please note that any and all soil sample results are reported on a dry-weight basis, unless otherwise noted below.

General QA/QC issues associated with the analytical data enclosed in this laboratory report will be indicated with a reference to a comment or explanation on the Data Qualifier page. More complex and involved QA/QC issues will be discussed in detail below.



Date of Report: October 10, 2018
 Samples Submitted: July 20, 2018
 Laboratory Reference: 1807-140
 Project: 14-05806-000

**TOTAL ORGANIC CARBON
 EPA 9060A**

Matrix: Sediment
 Units: % Carbon

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|----------------------|---------------------|------------|---------------|----------------------|----------------------|--------------|
| Client ID: | TYL-1R-2018 | | | | | |
| Laboratory ID: | 07-140-02 | | | | | |
| Total Organic Carbon | 1.1 | 0.060 | EPA 9060 | 7-30-18 | 7-30-18 | |
| Client ID: | SIDL-3R-2018 | | | | | |
| Laboratory ID: | 07-140-04 | | | | | |
| Total Organic Carbon | 2.2 | 0.061 | EPA 9060 | 7-30-18 | 7-30-18 | |
| Client ID: | TOSH-3R-2018 | | | | | |
| Laboratory ID: | 07-140-06 | | | | | |
| Total Organic Carbon | 2.9 | 0.18 | EPA 9060 | 7-30-18 | 7-30-18 | |



Date of Report: October 10, 2018
 Samples Submitted: July 20, 2018
 Laboratory Reference: 1807-140
 Project: 14-05806-000

**TOTAL ORGANIC CARBON
 EPA 9060A
 QUALITY CONTROL**

Matrix: Sediment
 Units: % Carbon

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|----------------------|-----------|-------|----------|---------------|---------------|-------|
| METHOD BLANK | | | | | | |
| Laboratory ID: | MB0730S1 | | | | | |
| Total Organic Carbon | ND | 0.042 | EPA 9060 | 7-30-18 | 7-30-18 | |

| Analyte | Result | Spike Level | Source Result | Percent Recovery | Recovery Limits | RPD | RPD Limit | Flags |
|----------------------|-----------|-------------|---------------|------------------|-----------------|-----|-----------|-------|
| DUPLICATE | | | | | | | | |
| Laboratory ID: | 07-124-01 | | | | | | | |
| | ORIG | DUP | | | | | | |
| Total Organic Carbon | ND | ND | NA | NA | NA | NA | 28 | |

| | | | | | | | | |
|----------------------|-------------|------|----|-----|---------|----|----|--|
| SPIKE BLANK | | | | | | | | |
| Laboratory ID: | SB0730S1 | | | | | | | |
| | SB | SB | | SB | | | | |
| Total Organic Carbon | 43.1 | 42.1 | NA | 102 | 102-119 | NA | NA | |



Date of Report: October 10, 2018
 Samples Submitted: July 20, 2018
 Laboratory Reference: 1807-140
 Project: 14-05806-000

**TOTAL METALS
 EPA 6010D**

Matrix: Sediment
 Units: mg/Kg (ppm)

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|-------------------|--------------------|-----|-----------|---------------|---------------|-------|
| Client ID: | TYL-1M-2018 | | | | | |
| Laboratory ID: | 07-140-01 | | | | | |
| Copper | 57 | 3.9 | EPA 6010D | 10-3-18 | 10-4-18 | |
| Zinc | 370 | 9.7 | EPA 6010D | 10-3-18 | 10-4-18 | |

| | | | | | | |
|-------------------|---------------------|-----|-----------|---------|---------|--|
| Client ID: | SIDL-3M-2018 | | | | | |
| Laboratory ID: | 07-140-03 | | | | | |
| Copper | 20 | 5.0 | EPA 6010D | 10-3-18 | 10-4-18 | |
| Zinc | 78 | 13 | EPA 6010D | 10-3-18 | 10-4-18 | |

| | | | | | | |
|-------------------|---------------------|-----|-----------|---------|---------|--|
| Client ID: | TOSH-3M-2018 | | | | | |
| Laboratory ID: | 07-140-05 | | | | | |
| Copper | 41 | 2.1 | EPA 6010D | 10-3-18 | 10-4-18 | |
| Zinc | 500 | 5.3 | EPA 6010D | 10-3-18 | 10-4-18 | |



Date of Report: October 10, 2018
 Samples Submitted: July 20, 2018
 Laboratory Reference: 1807-140
 Project: 14-05806-000

**TOTAL METALS
 EPA 6010D
 QUALITY CONTROL**

Matrix: Sediment
 Units: mg/Kg (ppm)

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|---------------------|-----------|-----|-----------|---------------|---------------|-------|
| METHOD BLANK | | | | | | |
| Laboratory ID: | MB1003SM4 | | | | | |
| Copper | ND | 1.0 | EPA 6010D | 10-3-18 | 10-3-18 | |
| Zinc | ND | 2.5 | EPA 6010D | 10-3-18 | 10-3-18 | |

| Analyte | Result | Spike Level | Source Result | Percent Recovery | Recovery Limits | RPD | RPD Limit | Flags |
|------------------|-------------|-------------|---------------|------------------|-----------------|-----|-----------|-------|
| DUPLICATE | | | | | | | | |
| Laboratory ID: | 08-051-01 | | | | | | | |
| | ORIG | DUP | | | | | | |
| Copper | 8.90 | 8.75 | NA | NA | NA | NA | 2 | 20 |
| Zinc | 65.3 | 65.0 | NA | NA | NA | NA | 0 | 20 |

MATRIX SPIKES

| | | | | | | | | | | |
|----------------|-------------|-------------|------|------|------|------------|------------|--------|---|----|
| Laboratory ID: | 08-051-01 | | | | | | | | | |
| | MS | MSD | MS | MSD | | MS | MSD | | | |
| Copper | 60.1 | 59.9 | 50.0 | 50.0 | 8.90 | 102 | 102 | 75-125 | 0 | 20 |
| Zinc | 164 | 163 | 100 | 100 | 65.3 | 99 | 98 | 75-125 | 1 | 20 |



Date of Report: October 10, 2018
 Samples Submitted: July 20, 2018
 Laboratory Reference: 1807-140
 Project: 14-05806-000

SEMIVOLATILES EPA 8270D/SIM

Matrix: Sediment
 Units: mg/Kg

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|-----------------------------|-------------------------|-----------------------|---------------|---------------|---------------|-------|
| Client ID: | TYL-1R-2018 | | | | | |
| Laboratory ID: | 07-140-02 | | | | | |
| Naphthalene | ND | 0.0067 | EPA 8270D/SIM | 7-24-18 | 7-24-18 | |
| 2-Methylnaphthalene | ND | 0.0067 | EPA 8270D/SIM | 7-24-18 | 7-24-18 | |
| 1-Methylnaphthalene | ND | 0.0067 | EPA 8270D/SIM | 7-24-18 | 7-24-18 | |
| Dimethylphthalate | ND | 0.033 | EPA 8270D | 7-24-18 | 7-24-18 | |
| Acenaphthylene | ND | 0.0067 | EPA 8270D/SIM | 7-24-18 | 7-24-18 | |
| Acenaphthene | ND | 0.0067 | EPA 8270D/SIM | 7-24-18 | 7-24-18 | |
| Diethylphthalate | ND | 0.17 | EPA 8270D | 7-24-18 | 7-24-18 | |
| Fluorene | ND | 0.0067 | EPA 8270D/SIM | 7-24-18 | 7-24-18 | |
| Phenanthrene | 0.0079 | 0.0067 | EPA 8270D/SIM | 7-24-18 | 7-24-18 | |
| Anthracene | ND | 0.0067 | EPA 8270D/SIM | 7-24-18 | 7-24-18 | |
| Di-n-butylphthalate | ND | 0.17 | EPA 8270D | 7-24-18 | 7-24-18 | |
| Fluoranthene | 0.017 | 0.0067 | EPA 8270D/SIM | 7-24-18 | 7-24-18 | |
| Pyrene | 0.015 | 0.0067 | EPA 8270D/SIM | 7-24-18 | 7-24-18 | |
| Butylbenzylphthalate | ND | 0.17 | EPA 8270D | 7-24-18 | 7-24-18 | |
| Benzo[a]anthracene | 0.0070 | 0.0067 | EPA 8270D/SIM | 7-24-18 | 7-24-18 | |
| Chrysene | 0.0098 | 0.0067 | EPA 8270D/SIM | 7-24-18 | 7-24-18 | |
| bis(2-Ethylhexyl)phthalate | ND | 0.17 | EPA 8270D | 7-24-18 | 7-24-18 | |
| Di-n-octylphthalate | ND | 0.17 | EPA 8270D | 7-24-18 | 7-24-18 | |
| Benzo[b]fluoranthene | 0.014 | 0.0067 | EPA 8270D/SIM | 7-24-18 | 7-24-18 | |
| Benzo(j,k)fluoranthene | ND | 0.0067 | EPA 8270D/SIM | 7-24-18 | 7-24-18 | |
| Benzo[a]pyrene | 0.012 | 0.0067 | EPA 8270D/SIM | 7-24-18 | 7-24-18 | |
| Indeno[1,2,3-cd]pyrene | 0.0084 | 0.0067 | EPA 8270D/SIM | 7-24-18 | 7-24-18 | |
| Dibenz[a,h]anthracene | ND | 0.0067 | EPA 8270D/SIM | 7-24-18 | 7-24-18 | |
| Benzo[g,h,i]perylene | 0.0096 | 0.0067 | EPA 8270D/SIM | 7-24-18 | 7-24-18 | |
| <i>Surrogate:</i> | <i>Percent Recovery</i> | <i>Control Limits</i> | | | | |
| <i>2-Fluorophenol</i> | <i>51</i> | <i>19 - 103</i> | | | | |
| <i>Phenol-d6</i> | <i>65</i> | <i>30 - 103</i> | | | | |
| <i>Nitrobenzene-d5</i> | <i>56</i> | <i>27 - 105</i> | | | | |
| <i>2-Fluorobiphenyl</i> | <i>64</i> | <i>36 - 102</i> | | | | |
| <i>2,4,6-Tribromophenol</i> | <i>81</i> | <i>33 - 110</i> | | | | |
| <i>Terphenyl-d14</i> | <i>80</i> | <i>38 - 108</i> | | | | |



Date of Report: October 10, 2018
 Samples Submitted: July 20, 2018
 Laboratory Reference: 1807-140
 Project: 14-05806-000

SEMIVOLATILES EPA 8270D/SIM

Matrix: Sediment
 Units: mg/Kg

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|-----------------------------|-------------------------|-----------------------|---------------|---------------|---------------|-------|
| Client ID: | SIDL-3R-2018 | | | | | |
| Laboratory ID: | 07-140-04 | | | | | |
| Naphthalene | ND | 0.011 | EPA 8270D/SIM | 7-24-18 | 7-24-18 | |
| 2-Methylnaphthalene | ND | 0.011 | EPA 8270D/SIM | 7-24-18 | 7-24-18 | |
| 1-Methylnaphthalene | ND | 0.011 | EPA 8270D/SIM | 7-24-18 | 7-24-18 | |
| Dimethylphthalate | ND | 0.054 | EPA 8270D | 7-24-18 | 7-24-18 | |
| Acenaphthylene | ND | 0.011 | EPA 8270D/SIM | 7-24-18 | 7-24-18 | |
| Acenaphthene | ND | 0.011 | EPA 8270D/SIM | 7-24-18 | 7-24-18 | |
| Diethylphthalate | ND | 0.27 | EPA 8270D | 7-24-18 | 7-24-18 | |
| Fluorene | ND | 0.011 | EPA 8270D/SIM | 7-24-18 | 7-24-18 | |
| Phenanthrene | 0.026 | 0.011 | EPA 8270D/SIM | 7-24-18 | 7-24-18 | |
| Anthracene | ND | 0.011 | EPA 8270D/SIM | 7-24-18 | 7-24-18 | |
| Di-n-butylphthalate | ND | 0.27 | EPA 8270D | 7-24-18 | 7-24-18 | |
| Fluoranthene | 0.023 | 0.011 | EPA 8270D/SIM | 7-24-18 | 7-24-18 | |
| Pyrene | 0.036 | 0.011 | EPA 8270D/SIM | 7-24-18 | 7-24-18 | |
| Butylbenzylphthalate | ND | 0.27 | EPA 8270D | 7-24-18 | 7-24-18 | |
| Benzo[a]anthracene | 0.014 | 0.011 | EPA 8270D/SIM | 7-24-18 | 7-24-18 | |
| Chrysene | 0.014 | 0.011 | EPA 8270D/SIM | 7-24-18 | 7-24-18 | |
| bis(2-Ethylhexyl)phthalate | ND | 0.27 | EPA 8270D | 7-24-18 | 7-24-18 | |
| Di-n-octylphthalate | ND | 0.27 | EPA 8270D | 7-24-18 | 7-24-18 | |
| Benzo[b]fluoranthene | 0.014 | 0.011 | EPA 8270D/SIM | 7-24-18 | 7-24-18 | |
| Benzo(j,k)fluoranthene | ND | 0.011 | EPA 8270D/SIM | 7-24-18 | 7-24-18 | |
| Benzo[a]pyrene | 0.018 | 0.011 | EPA 8270D/SIM | 7-24-18 | 7-24-18 | |
| Indeno[1,2,3-cd]pyrene | ND | 0.011 | EPA 8270D/SIM | 7-24-18 | 7-24-18 | |
| Dibenz[a,h]anthracene | ND | 0.011 | EPA 8270D/SIM | 7-24-18 | 7-24-18 | |
| Benzo[g,h,i]perylene | ND | 0.011 | EPA 8270D/SIM | 7-24-18 | 7-24-18 | |
| <i>Surrogate:</i> | <i>Percent Recovery</i> | <i>Control Limits</i> | | | | |
| <i>2-Fluorophenol</i> | <i>56</i> | <i>19 - 103</i> | | | | |
| <i>Phenol-d6</i> | <i>65</i> | <i>30 - 103</i> | | | | |
| <i>Nitrobenzene-d5</i> | <i>65</i> | <i>27 - 105</i> | | | | |
| <i>2-Fluorobiphenyl</i> | <i>63</i> | <i>36 - 102</i> | | | | |
| <i>2,4,6-Tribromophenol</i> | <i>73</i> | <i>33 - 110</i> | | | | |
| <i>Terphenyl-d14</i> | <i>78</i> | <i>38 - 108</i> | | | | |



Date of Report: October 10, 2018
 Samples Submitted: July 20, 2018
 Laboratory Reference: 1807-140
 Project: 14-05806-000

SEMIVOLATILES EPA 8270D/SIM

Matrix: Sediment
 Units: mg/Kg

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|-----------------------------|-------------------------|-----------------------|---------------|---------------|---------------|-------|
| Client ID: | TOSH-3R-2018 | | | | | |
| Laboratory ID: | 07-140-06 | | | | | |
| Naphthalene | ND | 0.015 | EPA 8270D/SIM | 7-24-18 | 7-24-18 | |
| 2-Methylnaphthalene | ND | 0.015 | EPA 8270D/SIM | 7-24-18 | 7-24-18 | |
| 1-Methylnaphthalene | ND | 0.015 | EPA 8270D/SIM | 7-24-18 | 7-24-18 | |
| Dimethylphthalate | ND | 0.37 | EPA 8270D | 7-24-18 | 7-24-18 | |
| Acenaphthylene | ND | 0.015 | EPA 8270D/SIM | 7-24-18 | 7-24-18 | |
| Acenaphthene | ND | 0.015 | EPA 8270D/SIM | 7-24-18 | 7-24-18 | |
| Diethylphthalate | ND | 1.9 | EPA 8270D | 7-24-18 | 7-24-18 | |
| Fluorene | ND | 0.015 | EPA 8270D/SIM | 7-24-18 | 7-24-18 | |
| Phenanthrene | 0.064 | 0.015 | EPA 8270D/SIM | 7-24-18 | 7-24-18 | |
| Anthracene | ND | 0.015 | EPA 8270D/SIM | 7-24-18 | 7-24-18 | |
| Di-n-butylphthalate | ND | 1.9 | EPA 8270D | 7-24-18 | 7-24-18 | |
| Fluoranthene | 0.14 | 0.015 | EPA 8270D/SIM | 7-24-18 | 7-24-18 | |
| Pyrene | 0.11 | 0.015 | EPA 8270D/SIM | 7-24-18 | 7-24-18 | |
| Butylbenzylphthalate | ND | 1.9 | EPA 8270D | 7-24-18 | 7-24-18 | |
| Benzo[a]anthracene | 0.053 | 0.015 | EPA 8270D/SIM | 7-24-18 | 7-24-18 | |
| Chrysene | 0.076 | 0.015 | EPA 8270D/SIM | 7-24-18 | 7-24-18 | |
| bis(2-Ethylhexyl)phthalate | ND | 1.9 | EPA 8270D | 7-24-18 | 7-24-18 | |
| Di-n-octylphthalate | ND | 1.9 | EPA 8270D | 7-24-18 | 7-24-18 | |
| Benzo[b]fluoranthene | 0.097 | 0.015 | EPA 8270D/SIM | 7-24-18 | 7-24-18 | |
| Benzo(j,k)fluoranthene | 0.027 | 0.015 | EPA 8270D/SIM | 7-24-18 | 7-24-18 | |
| Benzo[a]pyrene | 0.072 | 0.015 | EPA 8270D/SIM | 7-24-18 | 7-24-18 | |
| Indeno[1,2,3-cd]pyrene | 0.058 | 0.015 | EPA 8270D/SIM | 7-24-18 | 7-24-18 | |
| Dibenz[a,h]anthracene | ND | 0.015 | EPA 8270D/SIM | 7-24-18 | 7-24-18 | |
| Benzo[g,h,i]perylene | 0.061 | 0.015 | EPA 8270D/SIM | 7-24-18 | 7-24-18 | |
| <i>Surrogate:</i> | <i>Percent Recovery</i> | <i>Control Limits</i> | | | | |
| <i>2-Fluorophenol</i> | <i>61</i> | <i>19 - 103</i> | | | | |
| <i>Phenol-d6</i> | <i>70</i> | <i>30 - 103</i> | | | | |
| <i>Nitrobenzene-d5</i> | <i>71</i> | <i>27 - 105</i> | | | | |
| <i>2-Fluorobiphenyl</i> | <i>68</i> | <i>36 - 102</i> | | | | |
| <i>2,4,6-Tribromophenol</i> | <i>71</i> | <i>33 - 110</i> | | | | |
| <i>Terphenyl-d14</i> | <i>80</i> | <i>38 - 108</i> | | | | |



Date of Report: October 10, 2018
 Samples Submitted: July 20, 2018
 Laboratory Reference: 1807-140
 Project: 14-05806-000

**SEMIVOLATILES EPA 8270D/SIM
 METHOD BLANK QUALITY CONTROL**

Matrix: Sediment
 Units: mg/Kg

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|-----------------------------|-------------------------|-----------------------|---------------|---------------|---------------|-------|
| Laboratory ID: | MB0724S2 | | | | | |
| Naphthalene | ND | 0.0040 | EPA 8270D/SIM | 7-24-18 | 7-24-18 | |
| 2-Methylnaphthalene | ND | 0.0040 | EPA 8270D/SIM | 7-24-18 | 7-24-18 | |
| 1-Methylnaphthalene | ND | 0.0040 | EPA 8270D/SIM | 7-24-18 | 7-24-18 | |
| Dimethylphthalate | ND | 0.020 | EPA 8270D | 7-24-18 | 7-24-18 | |
| Acenaphthylene | ND | 0.0040 | EPA 8270D/SIM | 7-24-18 | 7-24-18 | |
| Acenaphthene | ND | 0.0040 | EPA 8270D/SIM | 7-24-18 | 7-24-18 | |
| Diethylphthalate | ND | 0.10 | EPA 8270D | 7-24-18 | 7-24-18 | |
| Fluorene | ND | 0.0040 | EPA 8270D/SIM | 7-24-18 | 7-24-18 | |
| Phenanthrene | ND | 0.0040 | EPA 8270D/SIM | 7-24-18 | 7-24-18 | |
| Anthracene | ND | 0.0040 | EPA 8270D/SIM | 7-24-18 | 7-24-18 | |
| Di-n-butylphthalate | ND | 0.10 | EPA 8270D | 7-24-18 | 7-24-18 | |
| Fluoranthene | ND | 0.0040 | EPA 8270D/SIM | 7-24-18 | 7-24-18 | |
| Pyrene | ND | 0.0040 | EPA 8270D/SIM | 7-24-18 | 7-24-18 | |
| Butylbenzylphthalate | ND | 0.10 | EPA 8270D | 7-24-18 | 7-24-18 | |
| Benzo[a]anthracene | ND | 0.0040 | EPA 8270D/SIM | 7-24-18 | 7-24-18 | |
| Chrysene | ND | 0.0040 | EPA 8270D/SIM | 7-24-18 | 7-24-18 | |
| bis(2-Ethylhexyl)phthalate | ND | 0.10 | EPA 8270D | 7-24-18 | 7-24-18 | |
| Di-n-octylphthalate | ND | 0.10 | EPA 8270D | 7-24-18 | 7-24-18 | |
| Benzo[b]fluoranthene | ND | 0.0040 | EPA 8270D/SIM | 7-24-18 | 7-24-18 | |
| Benzo[j,k]fluoranthene | ND | 0.0040 | EPA 8270D/SIM | 7-24-18 | 7-24-18 | |
| Benzo[a]pyrene | ND | 0.0040 | EPA 8270D/SIM | 7-24-18 | 7-24-18 | |
| Indeno[1,2,3-cd]pyrene | ND | 0.0040 | EPA 8270D/SIM | 7-24-18 | 7-24-18 | |
| Dibenz[a,h]anthracene | ND | 0.0040 | EPA 8270D/SIM | 7-24-18 | 7-24-18 | |
| Benzo[g,h,i]perylene | ND | 0.0040 | EPA 8270D/SIM | 7-24-18 | 7-24-18 | |
| <i>Surrogate:</i> | <i>Percent Recovery</i> | <i>Control Limits</i> | | | | |
| <i>2-Fluorophenol</i> | <i>67</i> | <i>19 - 103</i> | | | | |
| <i>Phenol-d6</i> | <i>77</i> | <i>30 - 103</i> | | | | |
| <i>Nitrobenzene-d5</i> | <i>75</i> | <i>27 - 105</i> | | | | |
| <i>2-Fluorobiphenyl</i> | <i>82</i> | <i>36 - 102</i> | | | | |
| <i>2,4,6-Tribromophenol</i> | <i>89</i> | <i>33 - 110</i> | | | | |
| <i>Terphenyl-d14</i> | <i>95</i> | <i>38 - 108</i> | | | | |



Date of Report: October 10, 2018
 Samples Submitted: July 20, 2018
 Laboratory Reference: 1807-140
 Project: 14-05806-000

**SEMIVOLATILES EPA 8270D/SIM
 SB/SBD QUALITY CONTROL**

Matrix: Sediment
 Units: mg/Kg

| Analyte | Result | | Spike Level | | Percent Recovery | | Recovery | RPD | RPD | Flags |
|-----------------------------|--------------|--------------|-------------|-------|------------------|-----------|-----------------|-----|-----|-------|
| | | | | | Recovery | Limits | Limit | | | |
| SPIKE BLANKS | | | | | | | | | | |
| Laboratory ID: | SB0724S2 | | | | | | | | | |
| | SB | SBD | SB | SBD | SB | SBD | | | | |
| Phenol | 0.628 | 0.686 | 0.800 | 0.800 | 79 | 86 | 45 - 94 | 9 | 29 | |
| 2-Chlorophenol | 0.650 | 0.697 | 0.800 | 0.800 | 81 | 87 | 46 - 94 | 7 | 33 | |
| 1,4-Dichlorobenzene | 0.302 | 0.334 | 0.400 | 0.400 | 76 | 84 | 42 - 91 | 10 | 37 | |
| n-Nitroso-di-n-propylamine | 0.345 | 0.365 | 0.400 | 0.400 | 86 | 91 | 45 - 100 | 6 | 26 | |
| 1,2,4-Trichlorobenzene | 0.345 | 0.381 | 0.400 | 0.400 | 86 | 95 | 45 - 100 | 10 | 32 | |
| 4-Chloro-3-methylphenol | 0.720 | 0.761 | 0.800 | 0.800 | 90 | 95 | 55 - 97 | 6 | 21 | |
| Acenaphthene | 0.332 | 0.349 | 0.400 | 0.400 | 83 | 87 | 48 - 91 | 5 | 21 | |
| 4-Nitrophenol | 0.693 | 0.745 | 0.800 | 0.800 | 87 | 93 | 53 - 102 | 7 | 20 | |
| 2,4-Dinitrotoluene | 0.321 | 0.352 | 0.400 | 0.400 | 80 | 88 | 47 - 96 | 9 | 19 | |
| Pentachlorophenol | 0.882 | 0.966 | 0.800 | 0.800 | 110 | 121 | 35 - 125 | 9 | 26 | |
| Pyrene | 0.382 | 0.407 | 0.400 | 0.400 | 96 | 102 | 55 - 110 | 6 | 17 | |
| <i>Surrogate:</i> | | | | | | | | | | |
| <i>2-Fluorophenol</i> | | | | | <i>65</i> | <i>71</i> | <i>19 - 103</i> | | | |
| <i>Phenol-d6</i> | | | | | <i>74</i> | <i>79</i> | <i>30 - 103</i> | | | |
| <i>Nitrobenzene-d5</i> | | | | | <i>73</i> | <i>78</i> | <i>27 - 105</i> | | | |
| <i>2-Fluorobiphenyl</i> | | | | | <i>76</i> | <i>79</i> | <i>36 - 102</i> | | | |
| <i>2,4,6-Tribromophenol</i> | | | | | <i>81</i> | <i>89</i> | <i>33 - 110</i> | | | |
| <i>Terphenyl-d14</i> | | | | | <i>84</i> | <i>88</i> | <i>38 - 108</i> | | | |



Date of Report: October 10, 2018
 Samples Submitted: July 20, 2018
 Laboratory Reference: 1807-140
 Project: 14-05806-000

**TOTAL SOLIDS
 SM 2540G**

Matrix: Sediment
 Units: % Solids

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|-------------------|---------------------|------|----------|---------------|---------------|-------|
| Client ID: | TYL-1M-2018 | | | | | |
| Laboratory ID: | 07-140-01 | | | | | |
| Total Solids | 26 | 0.50 | SM 2540G | 10-5-18 | 10-8-18 | |
| Client ID: | TYL-1R-2018 | | | | | |
| Laboratory ID: | 07-140-02 | | | | | |
| Total Solids | 60 | 0.50 | SM 2540G | 7-24-18 | 7-25-18 | |
| Client ID: | SIDL-3M-2018 | | | | | |
| Laboratory ID: | 07-140-03 | | | | | |
| Total Solids | 20 | 0.50 | SM 2540G | 10-5-18 | 10-8-18 | |
| Client ID: | SIDL-3R-2018 | | | | | |
| Laboratory ID: | 07-140-04 | | | | | |
| Total Solids | 37 | 0.50 | SM 2540G | 7-24-18 | 7-25-18 | |
| Client ID: | TOSH-3M-2018 | | | | | |
| Laboratory ID: | 07-140-05 | | | | | |
| Total Solids | 47 | 0.50 | SM 2540G | 10-5-18 | 10-8-18 | |
| Client ID: | TOSH-3R-2018 | | | | | |
| Laboratory ID: | 07-140-06 | | | | | |
| Total Solids | 54 | 0.50 | SM 2540G | 7-24-18 | 7-25-18 | |



Date of Report: October 10, 2018
 Samples Submitted: July 20, 2018
 Laboratory Reference: 1807-140
 Project: 14-05806-000

**TOTAL SOLIDS
 SM 2540G
 QUALITY CONTROL**

Matrix: Sediment
 Units: % Solids

| Analyte | Result | | Spike Level | Source Result | Percent Recovery | Recovery Limits | RPD | RPD Limit | Flags |
|------------------|---------------|-------------|--------------------|----------------------|-------------------------|------------------------|------------|------------------|--------------|
| DUPLICATE | | | | | | | | | |
| Laboratory ID: | 07-140-02 | | | | | | | | |
| | ORIG | DUP | | | | | | | |
| Total Solids | 59.9 | 63.2 | NA | NA | NA | NA | 5 | 20 | |
| Laboratory ID: | 09-115-09 | | | | | | | | |
| | ORIG | DUP | | | | | | | |
| Total Solids | 35.5 | 41.3 | NA | NA | NA | NA | 15 | 20 | |





Data Qualifiers and Abbreviations

- A - Due to a high sample concentration, the amount spiked is insufficient for meaningful MS/MSD recovery data.
 - B - The analyte indicated was also found in the blank sample.
 - C - The duplicate RPD is outside control limits due to high result variability when analyte concentrations are within five times the quantitation limit.
 - E - The value reported exceeds the quantitation range and is an estimate.
 - F - Surrogate recovery data is not available due to the high concentration of coeluting target compounds.
 - H - The analyte indicated is a common laboratory solvent and may have been introduced during sample preparation, and be impacting the sample result.
 - I - Compound recovery is outside of the control limits.
 - J - The value reported was below the practical quantitation limit. The value is an estimate.
 - K - Sample duplicate RPD is outside control limits due to sample inhomogeneity. The sample was re-extracted and re-analyzed with similar results.
 - L - The RPD is outside of the control limits.
 - M - Hydrocarbons in the gasoline range are impacting the diesel range result.
 - M1 - Hydrocarbons in the gasoline range (toluene-naphthalene) are present in the sample.
 - N - Hydrocarbons in the lube oil range are impacting the diesel range result.
 - N1 - Hydrocarbons in diesel range are impacting lube oil range results.
 - O - Hydrocarbons indicative of heavier fuels are present in the sample and are impacting the gasoline result.
 - P - The RPD of the detected concentrations between the two columns is greater than 40.
 - Q - Surrogate recovery is outside of the control limits.
 - S - Surrogate recovery data is not available due to the necessary dilution of the sample.
 - T - The sample chromatogram is not similar to a typical _____.
 - U - The analyte was analyzed for, but was not detected above the reported sample quantitation limit.
 - U1 - The practical quantitation limit is elevated due to interferences present in the sample.
 - V - Matrix Spike/Matrix Spike Duplicate recoveries are outside control limits due to matrix effects.
 - W - Matrix Spike/Matrix Spike Duplicate RPD are outside control limits due to matrix effects.
 - X - Sample extract treated with a mercury cleanup procedure.
 - X1 - Sample extract treated with a sulfuric acid/silica gel cleanup procedure.
 - Y - The calibration verification for this analyte exceeded the 20% drift specified in method 8260C, and therefore the reported result should be considered an estimate. The overall performance of the calibration verification standard met the acceptance criteria of the method.
 - Z -
- ND - Not Detected at PQL
 PQL - Practical Quantitation Limit
 RPD - Relative Percent Difference





14648 NE 95th Street, Redmond, WA 98052
Telephone: 425.883.3881

Company: Herrera Environmental Consultants
Project No.: 14-05806-000
Project Name: Redmond Paired Watershed Study
Project Manager: John Lenth

CHAIN OF CUSTODY

Turnaround Requested:

- 1 Day
- 2 Day
- 3 Day
- Standard

Laboratory No.

07-140 Requested Analyses

| Total Organic Carbon | Copper | Zinc | Polycyclic aromatic hydrocarbons | Phthalates | | | | | | | | | | | | | | |
|----------------------|--------|------|----------------------------------|------------|--|--|--|--|--|--|--|--|--|--|--|--|--|--|
| | | | | | | | | | | | | | | | | | | |

Total Solids
LEPA 25405

| Lab ID | Sample Identification | Date Sampled | Time Sampled | Matrix | # of Cont. | Total Organic Carbon | Copper | Zinc | Polycyclic aromatic hydrocarbons | Phthalates | | | | | | | | |
|--------|-----------------------|--------------|--------------|----------|------------|----------------------|--------|------|----------------------------------|------------|--|--|--|--|--|--|--|---|
| 1 | TYL-1M-2018 | 7.13.18 | 1245 | Sediment | 1 | | X | X | | | | | | | | | | X |
| 2 | TYL-1R-2018 | 7.13.18 | 1245 | Sediment | 1 | X | | | X | X | | | | | | | | X |
| 3 | SIDL-3M-2018 | 7.16.18 | 1225 | Sediment | 1 | | X | X | | | | | | | | | | X |
| 4 | SIDL-3R-2018 | 7.16.18 | 1225 | Sediment | 1 | X | | | X | X | | | | | | | | X |
| 5 | TOSH-3M-2018 | 7.20.18 | 1150 | Sediment | 1 | | X | X | | | | | | | | | | X |
| 6 | TOSH-3R-2018 | 7.20.18 | 1150 | Sediment | 1 | X | | | X | X | | | | | | | | X |
| | | | | Sediment | 1 | | | | | | | | | | | | | |
| | | | | Sediment | 1 | | | | | | | | | | | | | |
| | | | | Sediment | 1 | | | | | | | | | | | | | |
| | | | | Sediment | 1 | | | | | | | | | | | | | |
| | | | | Sediment | 1 | | | | | | | | | | | | | |
| | | | | Sediment | 1 | | | | | | | | | | | | | |
| | | | | Sediment | 1 | | | | | | | | | | | | | |
| | | | | Sediment | 1 | | | | | | | | | | | | | |

Relinquished by Miaunhua Date 7.20.18 Received by Karla Ueda Date 7/20/18
 Firm Herrera Time 1600 Firm OSE Time 1602

Relinquished by _____ Date _____ Received by _____ Date _____
 Firm _____ Time _____ Firm _____ Time _____

Comments:



Data Quality Assurance Worksheet

Project Name/No./Client: Redmond Paired Watershed Study / 14-05806-000 / City of Redmond
 Laboratory/Parameters: OnSite Environmental : TOC, Cu, Zn, PAHs, phthalates
 Sample Date/Sample ID: 7/13 - 20/2018 / TYL-1, SIDL-3, TOSH-3

By G. Catarra
 Date 10/17/2018 Page 1 of 1
 Checked: initials JL
 date 10/18/2018

| Parameter | Completeness/ Methodology | Pre-extraction Holding Times (minutes) | | Total Holding Times (days) | | Method Blanks Reporting Limit | Matrix Spikes/ Surrogate Recovery (%) | | Lab Control Samples Recovery (%) | | Lab Duplicates RPD (%) | | Field Duplicates RPD (%) | | Instrument Calibration/ Performance | ACTION |
|------------|------------------------------|--|------|-------------------------------|------|--|---|--------------------|--|------------|---------------------------|-------------------|-----------------------------|-------------------|---|-----------------------------------|
| | | Reported | Goal | Reported | Goal | | Reported | Goal | Reported | Goal | Reported | Goal ¹ | Reported | Goal ¹ | | |
| TOC | OK / EPA 9060A | NA | NA | 10-17 | ≤14 | ≤0.05% 0.05 % | NA | NA | 102 | ±20 | NC | ≤20 | NS | ≤35 | OK | NONE. EPA HOLDING TIME 28 DAYS |
| Copper | OK / EPA 6020 | NA | NA | 76-83 | ≤180 | ≤1.0 MG/KG 1.0 MG/KG | 102,102 | ±25 | NR | ±15 | 2 | ≤20 | NS | ≤35 | OK | NONE |
| Zinc | OK / EPA 6020 | NA | NA | 76-83 | ≤180 | ≤2.5 mg/kg 2.5 MG/KG | 99,98 | ±25 | NR | ±15 | 0 | ≤20 | NS | ≤35 | OK | NONE |
| PAHs | OK / EPA 8270D/SIM | 4-11 | ≤14 | 4-11 | ≤40 | ≤20 ug/kg 16-20 UG/KG | NR | NA / 21- 120 | 79-121 | 25- 141 | BS/BSD 6-10 | ≤40 | NS | ≤50 | OK | NONE |
| Phthalates | OK / EPA 8270D | 4-11 | ≤14 | 4-11 | ≤40 | ≤0.1 MG/KG 2-2.5 MG/KG | NR | NA / 21- 120 | 79-121 | 25- 141 | BS/BSD 6-10 | ≤40 | NS | ≤50 | OK | NONE |

¹ If the sample or duplicate value is less than five times the reporting limit, the difference is calculated rather than the relative percent difference (RPD). The QA goal is a difference <2 times the detection limit instead of the number indicated in the goal column.
 NA – not applicable or not available; NC – not calculable due to one or more values below the detection limit; NS – field duplicate not sampled.



14648 NE 95th Street, Redmond, WA 98052 • (425) 883-3881

October 10, 2018

John Lenth
Herrera Environmental Consultants, Inc.
2200 6th Avenue, Suite 1100
Seattle, WA 98121

Re: Analytical Data for Project 14-05806-000
Laboratory Reference No. 1808-051

Dear John:

Enclosed are the analytical results and associated quality control data for samples submitted on August 3, 2018.

The standard policy of OnSite Environmental, Inc. is to store your samples for 30 days from the date of receipt. If you require longer storage, please contact the laboratory.

We appreciate the opportunity to be of service to you on this project. If you have any questions concerning the data, or need additional information, please feel free to call me.

Sincerely,

A handwritten signature in black ink, appearing to read "Blair Goodrow", enclosed within a large, loopy circular flourish.

Blair Goodrow
Project Manager

Enclosures



OnSite Environmental, Inc. 14648 NE 95th Street, Redmond, WA 98052 (425) 883-3881

This report pertains to the samples analyzed in accordance with the chain of custody, and is intended only for the use of the individual or company to whom it is addressed.

Date of Report: October 10, 2018
Samples Submitted: August 3, 2018
Laboratory Reference: 1808-051
Project: 14-05806-000

Case Narrative

Samples were collected on July 25, 26, August 2 and 3, 2018 and received by the laboratory on August 3, 2018. They were maintained at the laboratory at a temperature of 2°C to 6°C.

Please note that any and all soil sample results are reported on a dry-weight basis, unless otherwise noted below.

General QA/QC issues associated with the analytical data enclosed in this laboratory report will be indicated with a reference to a comment or explanation on the Data Qualifier page. More complex and involved QA/QC issues will be discussed in detail below.

Total Solids SM 2540G

The duplicate RPD for Total Solids, effecting samples MONT-4M-2018, MONT-3M-2018, QA-M-2018, TYLR-2M-2018, and TOSH-1M-2018, is outside control limits due to sample inhomogeneity.

Please note that any other QA/QC issues associated with these extractions and analyses will be indicated with a footnote reference and discussed in detail on the Data Qualifier page.



Date of Report: October 10, 2018
 Samples Submitted: August 3, 2018
 Laboratory Reference: 1808-051
 Project: 14-05806-000

**TOTAL ORGANIC CARBON
 EPA 9060A**

Matrix: Sediment
 Units: % Carbon

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|----------------------|---------------------|-------|----------|---------------|---------------|-------|
| Client ID: | MONT-4R-2018 | | | | | |
| Laboratory ID: | 08-051-02 | | | | | |
| Total Organic Carbon | 12 | 0.43 | EPA 9060 | 8-20-18 | 8-20-18 | |
| Client ID: | MONT-3R-2018 | | | | | |
| Laboratory ID: | 08-051-04 | | | | | |
| Total Organic Carbon | 4.9 | 0.20 | EPA 9060 | 8-20-18 | 8-20-18 | |
| Client ID: | QA-R-2018 | | | | | |
| Laboratory ID: | 08-051-06 | | | | | |
| Total Organic Carbon | 4.0 | 0.093 | EPA 9060 | 8-20-18 | 8-20-18 | |
| Client ID: | TYLR-2R-2018 | | | | | |
| Laboratory ID: | 08-051-08 | | | | | |
| Total Organic Carbon | 4.0 | 0.13 | EPA 9060 | 8-20-18 | 8-20-18 | |
| Client ID: | TOSH-1R-2018 | | | | | |
| Laboratory ID: | 08-051-10 | | | | | |
| Total Organic Carbon | 2.4 | 0.061 | EPA 9060 | 8-20-18 | 8-20-18 | |



Date of Report: October 10, 2018
 Samples Submitted: August 3, 2018
 Laboratory Reference: 1808-051
 Project: 14-05806-000

**TOTAL ORGANIC CARBON
 EPA 9060A
 QUALITY CONTROL**

Matrix: Sediment
 Units: % Carbon

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|----------------------|-----------|-------|----------|---------------|---------------|-------|
| METHOD BLANK | | | | | | |
| Laboratory ID: | MB0820S1 | | | | | |
| Total Organic Carbon | ND | 0.042 | EPA 9060 | 8-20-18 | 8-20-18 | |

| Analyte | Result | Spike Level | Source Result | Percent Recovery | Recovery Limits | RPD | RPD Limit | Flags |
|----------------------|-------------|-------------|---------------|------------------|-----------------|-----|-----------|-------|
| DUPLICATE | | | | | | | | |
| Laboratory ID: | 08-051-10 | | | | | | | |
| | ORIG | DUP | | | | | | |
| Total Organic Carbon | 2.40 | 2.49 | NA | NA | NA | 4 | 28 | |

SPIKE BLANK

| | | | | | | | | |
|----------------------|-------------|------|----|-----|---------|----|----|--|
| Laboratory ID: | SB0820S1 | | | | | | | |
| | SB | SB | | SB | | | | |
| Total Organic Carbon | 47.4 | 42.1 | NA | 113 | 102-119 | NA | NA | |



Date of Report: October 10, 2018
 Samples Submitted: August 3, 2018
 Laboratory Reference: 1808-051
 Project: 14-05806-000

**TOTAL METALS
 EPA 6010D**

Matrix: Sediment
 Units: mg/Kg (ppm)

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|-------------------|---------------------|-----|-----------|---------------|---------------|-------|
| Client ID: | MONT-4M-2018 | | | | | |
| Laboratory ID: | 08-051-01 | | | | | |
| Copper | 56 | 6.3 | EPA 6010D | 10-3-18 | 10-3-18 | |
| Zinc | 410 | 16 | EPA 6010D | 10-3-18 | 10-3-18 | |

| | | | | | | |
|-------------------|---------------------|-----|-----------|---------|---------|--|
| Client ID: | MONT-3M-2018 | | | | | |
| Laboratory ID: | 08-051-03 | | | | | |
| Copper | 65 | 5.2 | EPA 6010D | 10-3-18 | 10-4-18 | |
| Zinc | 1200 | 13 | EPA 6010D | 10-3-18 | 10-4-18 | |

| | | | | | | |
|-------------------|------------------|-----|-----------|---------|---------|--|
| Client ID: | QA-M-2018 | | | | | |
| Laboratory ID: | 08-051-05 | | | | | |
| Copper | 52 | 4.5 | EPA 6010D | 10-3-18 | 10-4-18 | |
| Zinc | 920 | 11 | EPA 6010D | 10-3-18 | 10-4-18 | |

| | | | | | | |
|-------------------|---------------------|-----|-----------|---------|---------|--|
| Client ID: | TYLR-2M-2018 | | | | | |
| Laboratory ID: | 08-051-07 | | | | | |
| Copper | 110 | 4.5 | EPA 6010D | 10-3-18 | 10-4-18 | |
| Zinc | 780 | 11 | EPA 6010D | 10-3-18 | 10-4-18 | |

| | | | | | | |
|-------------------|---------------------|-----|-----------|---------|---------|--|
| Client ID: | TOSH-1M-2018 | | | | | |
| Laboratory ID: | 08-051-09 | | | | | |
| Copper | 32 | 2.3 | EPA 6010D | 10-3-18 | 10-4-18 | |
| Zinc | 290 | 5.6 | EPA 6010D | 10-3-18 | 10-4-18 | |



Date of Report: October 10, 2018
 Samples Submitted: August 3, 2018
 Laboratory Reference: 1808-051
 Project: 14-05806-000

**TOTAL METALS
 EPA 6010D
 QUALITY CONTROL**

Matrix: Sediment
 Units: mg/Kg (ppm)

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|---------------------|-----------|-----|-----------|---------------|---------------|-------|
| METHOD BLANK | | | | | | |
| Laboratory ID: | MB1003SM4 | | | | | |
| Copper | ND | 1.0 | EPA 6010D | 10-3-18 | 10-3-18 | |
| Zinc | ND | 2.5 | EPA 6010D | 10-3-18 | 10-3-18 | |

| Analyte | Result | Spike Level | Source Result | Percent Recovery | Recovery Limits | RPD | RPD Limit | Flags |
|------------------|-------------|-------------|---------------|------------------|-----------------|-----|-----------|-------|
| DUPLICATE | | | | | | | | |
| Laboratory ID: | 08-051-01 | | | | | | | |
| | ORIG | DUP | | | | | | |
| Copper | 8.90 | 8.75 | NA | NA | NA | NA | 2 | 20 |
| Zinc | 65.3 | 65.0 | NA | NA | NA | NA | 0 | 20 |

MATRIX SPIKES

| Laboratory ID: | MS | MSD | MS | MSD | MS | MSD | MS | MSD | RPD | RPD Limit | |
|----------------|-------------|-------------|------|------|------|------------|------------|--------|-----|-----------|--|
| Laboratory ID: | 08-051-01 | | | | | | | | | | |
| | MS | MSD | MS | MSD | MS | MSD | MS | MSD | | | |
| Copper | 60.1 | 59.9 | 50.0 | 50.0 | 8.90 | 102 | 102 | 75-125 | 0 | 20 | |
| Zinc | 164 | 163 | 100 | 100 | 65.3 | 99 | 98 | 75-125 | 1 | 20 | |



Date of Report: October 10, 2018
 Samples Submitted: August 3, 2018
 Laboratory Reference: 1808-051
 Project: 14-05806-000

SEMIVOLATILES EPA 8270D/SIM

Matrix: Sediment
 Units: mg/Kg

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|-----------------------------|-------------------------|-----------------------|---------------|---------------|---------------|-------|
| Client ID: | MONT-4R-2018 | | | | | |
| Laboratory ID: | 08-051-02 | | | | | |
| Naphthalene | ND | 0.021 | EPA 8270D/SIM | 8-6-18 | 8-6-18 | |
| 2-Methylnaphthalene | ND | 0.021 | EPA 8270D/SIM | 8-6-18 | 8-6-18 | |
| 1-Methylnaphthalene | ND | 0.021 | EPA 8270D/SIM | 8-6-18 | 8-6-18 | |
| Dimethylphthalate | ND | 0.11 | EPA 8270D | 8-6-18 | 8-7-18 | |
| Acenaphthylene | ND | 0.021 | EPA 8270D/SIM | 8-6-18 | 8-6-18 | |
| Acenaphthene | ND | 0.021 | EPA 8270D/SIM | 8-6-18 | 8-6-18 | |
| Diethylphthalate | ND | 0.53 | EPA 8270D | 8-6-18 | 8-7-18 | |
| Fluorene | ND | 0.021 | EPA 8270D/SIM | 8-6-18 | 8-6-18 | |
| Phenanthrene | ND | 0.021 | EPA 8270D/SIM | 8-6-18 | 8-6-18 | |
| Anthracene | ND | 0.021 | EPA 8270D/SIM | 8-6-18 | 8-6-18 | |
| Di-n-butylphthalate | ND | 0.53 | EPA 8270D | 8-6-18 | 8-7-18 | |
| Fluoranthene | ND | 0.021 | EPA 8270D/SIM | 8-6-18 | 8-6-18 | |
| Pyrene | ND | 0.021 | EPA 8270D/SIM | 8-6-18 | 8-6-18 | |
| Butylbenzylphthalate | ND | 0.53 | EPA 8270D | 8-6-18 | 8-7-18 | |
| Benzo[a]anthracene | ND | 0.021 | EPA 8270D/SIM | 8-6-18 | 8-6-18 | |
| Chrysene | ND | 0.021 | EPA 8270D/SIM | 8-6-18 | 8-6-18 | |
| bis(2-Ethylhexyl)phthalate | 0.57 | 0.53 | EPA 8270D | 8-6-18 | 8-7-18 | |
| Di-n-octylphthalate | ND | 0.53 | EPA 8270D | 8-6-18 | 8-7-18 | |
| Benzo[b]fluoranthene | ND | 0.021 | EPA 8270D/SIM | 8-6-18 | 8-6-18 | |
| Benzo(j,k)fluoranthene | ND | 0.021 | EPA 8270D/SIM | 8-6-18 | 8-6-18 | |
| Benzo[a]pyrene | ND | 0.021 | EPA 8270D/SIM | 8-6-18 | 8-6-18 | |
| Indeno[1,2,3-cd]pyrene | ND | 0.021 | EPA 8270D/SIM | 8-6-18 | 8-6-18 | |
| Dibenz[a,h]anthracene | ND | 0.021 | EPA 8270D/SIM | 8-6-18 | 8-6-18 | |
| Benzo[g,h,i]perylene | ND | 0.021 | EPA 8270D/SIM | 8-6-18 | 8-6-18 | |
| <i>Surrogate:</i> | <i>Percent Recovery</i> | <i>Control Limits</i> | | | | |
| <i>2-Fluorophenol</i> | <i>31</i> | <i>19 - 103</i> | | | | |
| <i>Phenol-d6</i> | <i>50</i> | <i>30 - 103</i> | | | | |
| <i>Nitrobenzene-d5</i> | <i>34</i> | <i>27 - 105</i> | | | | |
| <i>2-Fluorobiphenyl</i> | <i>46</i> | <i>36 - 102</i> | | | | |
| <i>2,4,6-Tribromophenol</i> | <i>71</i> | <i>33 - 110</i> | | | | |
| <i>Terphenyl-d14</i> | <i>68</i> | <i>38 - 108</i> | | | | |



Date of Report: October 10, 2018
 Samples Submitted: August 3, 2018
 Laboratory Reference: 1808-051
 Project: 14-05806-000

SEMIVOLATILES EPA 8270D/SIM

Matrix: Sediment
 Units: mg/Kg

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|-----------------------------|-------------------------|-----------------------|---------------|---------------|---------------|-------|
| Client ID: | MONT-3R-2018 | | | | | |
| Laboratory ID: | 08-051-04 | | | | | |
| Naphthalene | ND | 0.025 | EPA 8270D/SIM | 8-6-18 | 8-6-18 | |
| 2-Methylnaphthalene | ND | 0.025 | EPA 8270D/SIM | 8-6-18 | 8-6-18 | |
| 1-Methylnaphthalene | ND | 0.025 | EPA 8270D/SIM | 8-6-18 | 8-6-18 | |
| Dimethylphthalate | ND | 0.62 | EPA 8270D | 8-6-18 | 8-7-18 | |
| Acenaphthylene | ND | 0.025 | EPA 8270D/SIM | 8-6-18 | 8-6-18 | |
| Acenaphthene | ND | 0.025 | EPA 8270D/SIM | 8-6-18 | 8-6-18 | |
| Diethylphthalate | ND | 3.1 | EPA 8270D | 8-6-18 | 8-7-18 | |
| Fluorene | ND | 0.025 | EPA 8270D/SIM | 8-6-18 | 8-6-18 | |
| Phenanthrene | ND | 0.025 | EPA 8270D/SIM | 8-6-18 | 8-6-18 | |
| Anthracene | ND | 0.025 | EPA 8270D/SIM | 8-6-18 | 8-6-18 | |
| Di-n-butylphthalate | ND | 3.1 | EPA 8270D | 8-6-18 | 8-7-18 | |
| Fluoranthene | ND | 0.025 | EPA 8270D/SIM | 8-6-18 | 8-6-18 | |
| Pyrene | ND | 0.025 | EPA 8270D/SIM | 8-6-18 | 8-6-18 | |
| Butylbenzylphthalate | ND | 3.1 | EPA 8270D | 8-6-18 | 8-7-18 | |
| Benzo[a]anthracene | ND | 0.025 | EPA 8270D/SIM | 8-6-18 | 8-6-18 | |
| Chrysene | ND | 0.025 | EPA 8270D/SIM | 8-6-18 | 8-6-18 | |
| bis(2-Ethylhexyl)phthalate | ND | 3.1 | EPA 8270D | 8-6-18 | 8-7-18 | |
| Di-n-octylphthalate | ND | 3.1 | EPA 8270D | 8-6-18 | 8-7-18 | |
| Benzo[b]fluoranthene | 0.026 | 0.025 | EPA 8270D/SIM | 8-6-18 | 8-6-18 | |
| Benzo(j,k)fluoranthene | ND | 0.025 | EPA 8270D/SIM | 8-6-18 | 8-6-18 | |
| Benzo[a]pyrene | 0.026 | 0.025 | EPA 8270D/SIM | 8-6-18 | 8-6-18 | |
| Indeno[1,2,3-cd]pyrene | ND | 0.025 | EPA 8270D/SIM | 8-6-18 | 8-6-18 | |
| Dibenz[a,h]anthracene | ND | 0.025 | EPA 8270D/SIM | 8-6-18 | 8-6-18 | |
| Benzo[g,h,i]perylene | 0.027 | 0.025 | EPA 8270D/SIM | 8-6-18 | 8-6-18 | |
| <i>Surrogate:</i> | <i>Percent Recovery</i> | <i>Control Limits</i> | | | | |
| <i>2-Fluorophenol</i> | <i>41</i> | <i>19 - 103</i> | | | | |
| <i>Phenol-d6</i> | <i>64</i> | <i>30 - 103</i> | | | | |
| <i>Nitrobenzene-d5</i> | <i>56</i> | <i>27 - 105</i> | | | | |
| <i>2-Fluorobiphenyl</i> | <i>61</i> | <i>36 - 102</i> | | | | |
| <i>2,4,6-Tribromophenol</i> | <i>66</i> | <i>33 - 110</i> | | | | |
| <i>Terphenyl-d14</i> | <i>68</i> | <i>38 - 108</i> | | | | |



Date of Report: October 10, 2018
 Samples Submitted: August 3, 2018
 Laboratory Reference: 1808-051
 Project: 14-05806-000

SEMIVOLATILES EPA 8270D/SIM

Matrix: Sediment
 Units: mg/Kg

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|-----------------------------|-------------------------|-----------------------|---------------|---------------|---------------|-------|
| Client ID: | QA-R-2018 | | | | | |
| Laboratory ID: | 08-051-06 | | | | | |
| Naphthalene | ND | 0.0099 | EPA 8270D/SIM | 8-6-18 | 8-6-18 | |
| 2-Methylnaphthalene | ND | 0.0099 | EPA 8270D/SIM | 8-6-18 | 8-6-18 | |
| 1-Methylnaphthalene | ND | 0.0099 | EPA 8270D/SIM | 8-6-18 | 8-6-18 | |
| Dimethylphthalate | ND | 0.049 | EPA 8270D | 8-6-18 | 8-7-18 | |
| Acenaphthylene | ND | 0.0099 | EPA 8270D/SIM | 8-6-18 | 8-6-18 | |
| Acenaphthene | ND | 0.0099 | EPA 8270D/SIM | 8-6-18 | 8-6-18 | |
| Diethylphthalate | ND | 0.25 | EPA 8270D | 8-6-18 | 8-7-18 | |
| Fluorene | ND | 0.0099 | EPA 8270D/SIM | 8-6-18 | 8-6-18 | |
| Phenanthrene | ND | 0.0099 | EPA 8270D/SIM | 8-6-18 | 8-6-18 | |
| Anthracene | ND | 0.0099 | EPA 8270D/SIM | 8-6-18 | 8-6-18 | |
| Di-n-butylphthalate | ND | 0.25 | EPA 8270D | 8-6-18 | 8-7-18 | |
| Fluoranthene | 0.014 | 0.0099 | EPA 8270D/SIM | 8-6-18 | 8-6-18 | |
| Pyrene | 0.016 | 0.0099 | EPA 8270D/SIM | 8-6-18 | 8-6-18 | |
| Butylbenzylphthalate | ND | 0.25 | EPA 8270D | 8-6-18 | 8-7-18 | |
| Benzo[a]anthracene | ND | 0.0099 | EPA 8270D/SIM | 8-6-18 | 8-6-18 | |
| Chrysene | 0.013 | 0.0099 | EPA 8270D/SIM | 8-6-18 | 8-6-18 | |
| bis(2-Ethylhexyl)phthalate | 0.50 | 0.25 | EPA 8270D | 8-6-18 | 8-7-18 | |
| Di-n-octylphthalate | ND | 0.25 | EPA 8270D | 8-6-18 | 8-7-18 | |
| Benzo[b]fluoranthene | 0.016 | 0.0099 | EPA 8270D/SIM | 8-6-18 | 8-6-18 | |
| Benzo(j,k)fluoranthene | ND | 0.0099 | EPA 8270D/SIM | 8-6-18 | 8-6-18 | |
| Benzo[a]pyrene | 0.017 | 0.0099 | EPA 8270D/SIM | 8-6-18 | 8-6-18 | |
| Indeno[1,2,3-cd]pyrene | 0.012 | 0.0099 | EPA 8270D/SIM | 8-6-18 | 8-6-18 | |
| Dibenz[a,h]anthracene | ND | 0.0099 | EPA 8270D/SIM | 8-6-18 | 8-6-18 | |
| Benzo[g,h,i]perylene | 0.017 | 0.0099 | EPA 8270D/SIM | 8-6-18 | 8-6-18 | |
| <i>Surrogate:</i> | <i>Percent Recovery</i> | <i>Control Limits</i> | | | | |
| <i>2-Fluorophenol</i> | <i>26</i> | <i>19 - 103</i> | | | | |
| <i>Phenol-d6</i> | <i>44</i> | <i>30 - 103</i> | | | | |
| <i>Nitrobenzene-d5</i> | <i>33</i> | <i>27 - 105</i> | | | | |
| <i>2-Fluorobiphenyl</i> | <i>45</i> | <i>36 - 102</i> | | | | |
| <i>2,4,6-Tribromophenol</i> | <i>61</i> | <i>33 - 110</i> | | | | |
| <i>Terphenyl-d14</i> | <i>59</i> | <i>38 - 108</i> | | | | |



Date of Report: October 10, 2018
 Samples Submitted: August 3, 2018
 Laboratory Reference: 1808-051
 Project: 14-05806-000

SEMIVOLATILES EPA 8270D/SIM

Matrix: Sediment
 Units: mg/Kg

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|-----------------------------|-------------------------|-----------------------|---------------|---------------|---------------|-------|
| Client ID: | TYLR-2R-2018 | | | | | |
| Laboratory ID: | 08-051-08 | | | | | |
| Naphthalene | ND | 0.011 | EPA 8270D/SIM | 8-6-18 | 8-6-18 | |
| 2-Methylnaphthalene | ND | 0.011 | EPA 8270D/SIM | 8-6-18 | 8-6-18 | |
| 1-Methylnaphthalene | ND | 0.011 | EPA 8270D/SIM | 8-6-18 | 8-6-18 | |
| Dimethylphthalate | ND | 0.057 | EPA 8270D | 8-6-18 | 8-7-18 | |
| Acenaphthylene | ND | 0.011 | EPA 8270D/SIM | 8-6-18 | 8-6-18 | |
| Acenaphthene | ND | 0.011 | EPA 8270D/SIM | 8-6-18 | 8-6-18 | |
| Diethylphthalate | ND | 0.28 | EPA 8270D | 8-6-18 | 8-7-18 | |
| Fluorene | ND | 0.011 | EPA 8270D/SIM | 8-6-18 | 8-6-18 | |
| Phenanthrene | 0.023 | 0.011 | EPA 8270D/SIM | 8-6-18 | 8-6-18 | |
| Anthracene | ND | 0.011 | EPA 8270D/SIM | 8-6-18 | 8-6-18 | |
| Di-n-butylphthalate | 0.49 | 0.28 | EPA 8270D | 8-6-18 | 8-7-18 | |
| Fluoranthene | 0.036 | 0.011 | EPA 8270D/SIM | 8-6-18 | 8-6-18 | |
| Pyrene | 0.027 | 0.011 | EPA 8270D/SIM | 8-6-18 | 8-6-18 | |
| Butylbenzylphthalate | ND | 0.28 | EPA 8270D | 8-6-18 | 8-7-18 | |
| Benzo[a]anthracene | 0.016 | 0.011 | EPA 8270D/SIM | 8-6-18 | 8-6-18 | |
| Chrysene | 0.017 | 0.011 | EPA 8270D/SIM | 8-6-18 | 8-6-18 | |
| bis(2-Ethylhexyl)phthalate | ND | 0.28 | EPA 8270D | 8-6-18 | 8-7-18 | |
| Di-n-octylphthalate | ND | 0.28 | EPA 8270D | 8-6-18 | 8-7-18 | |
| Benzo[b]fluoranthene | 0.025 | 0.011 | EPA 8270D/SIM | 8-6-18 | 8-6-18 | |
| Benzo(j,k)fluoranthene | ND | 0.011 | EPA 8270D/SIM | 8-6-18 | 8-6-18 | |
| Benzo[a]pyrene | 0.024 | 0.011 | EPA 8270D/SIM | 8-6-18 | 8-6-18 | |
| Indeno[1,2,3-cd]pyrene | 0.014 | 0.011 | EPA 8270D/SIM | 8-6-18 | 8-6-18 | |
| Dibenz[a,h]anthracene | ND | 0.011 | EPA 8270D/SIM | 8-6-18 | 8-6-18 | |
| Benzo[g,h,i]perylene | 0.015 | 0.011 | EPA 8270D/SIM | 8-6-18 | 8-6-18 | |
| <i>Surrogate:</i> | <i>Percent Recovery</i> | <i>Control Limits</i> | | | | |
| <i>2-Fluorophenol</i> | <i>29</i> | <i>19 - 103</i> | | | | |
| <i>Phenol-d6</i> | <i>46</i> | <i>30 - 103</i> | | | | |
| <i>Nitrobenzene-d5</i> | <i>37</i> | <i>27 - 105</i> | | | | |
| <i>2-Fluorobiphenyl</i> | <i>47</i> | <i>36 - 102</i> | | | | |
| <i>2,4,6-Tribromophenol</i> | <i>63</i> | <i>33 - 110</i> | | | | |
| <i>Terphenyl-d14</i> | <i>60</i> | <i>38 - 108</i> | | | | |



Date of Report: October 10, 2018
 Samples Submitted: August 3, 2018
 Laboratory Reference: 1808-051
 Project: 14-05806-000

SEMIVOLATILES EPA 8270D/SIM

Matrix: Sediment
 Units: mg/Kg

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|-----------------------------|-------------------------|-----------------------|---------------|---------------|---------------|-------|
| Client ID: | TOSH-1R-2018 | | | | | |
| Laboratory ID: | 08-051-10 | | | | | |
| Naphthalene | ND | 0.017 | EPA 8270D/SIM | 8-6-18 | 8-6-18 | |
| 2-Methylnaphthalene | ND | 0.017 | EPA 8270D/SIM | 8-6-18 | 8-6-18 | |
| 1-Methylnaphthalene | ND | 0.017 | EPA 8270D/SIM | 8-6-18 | 8-6-18 | |
| Dimethylphthalate | ND | 0.42 | EPA 8270D | 8-6-18 | 8-7-18 | |
| Acenaphthylene | ND | 0.017 | EPA 8270D/SIM | 8-6-18 | 8-6-18 | |
| Acenaphthene | ND | 0.017 | EPA 8270D/SIM | 8-6-18 | 8-6-18 | |
| Diethylphthalate | ND | 2.1 | EPA 8270D | 8-6-18 | 8-7-18 | |
| Fluorene | ND | 0.017 | EPA 8270D/SIM | 8-6-18 | 8-6-18 | |
| Phenanthrene | 0.057 | 0.017 | EPA 8270D/SIM | 8-6-18 | 8-6-18 | |
| Anthracene | ND | 0.017 | EPA 8270D/SIM | 8-6-18 | 8-6-18 | |
| Di-n-butylphthalate | ND | 2.1 | EPA 8270D | 8-6-18 | 8-7-18 | |
| Fluoranthene | 0.11 | 0.017 | EPA 8270D/SIM | 8-6-18 | 8-6-18 | |
| Pyrene | 0.085 | 0.017 | EPA 8270D/SIM | 8-6-18 | 8-6-18 | |
| Butylbenzylphthalate | ND | 2.1 | EPA 8270D | 8-6-18 | 8-7-18 | |
| Benzo[a]anthracene | 0.043 | 0.017 | EPA 8270D/SIM | 8-6-18 | 8-6-18 | |
| Chrysene | 0.049 | 0.017 | EPA 8270D/SIM | 8-6-18 | 8-6-18 | |
| bis(2-Ethylhexyl)phthalate | ND | 2.1 | EPA 8270D | 8-6-18 | 8-7-18 | |
| Di-n-octylphthalate | ND | 2.1 | EPA 8270D | 8-6-18 | 8-7-18 | |
| Benzo[b]fluoranthene | 0.065 | 0.017 | EPA 8270D/SIM | 8-6-18 | 8-6-18 | |
| Benzo(j,k)fluoranthene | 0.021 | 0.017 | EPA 8270D/SIM | 8-6-18 | 8-6-18 | |
| Benzo[a]pyrene | 0.048 | 0.017 | EPA 8270D/SIM | 8-6-18 | 8-6-18 | |
| Indeno[1,2,3-cd]pyrene | 0.036 | 0.017 | EPA 8270D/SIM | 8-6-18 | 8-6-18 | |
| Dibenz[a,h]anthracene | ND | 0.017 | EPA 8270D/SIM | 8-6-18 | 8-6-18 | |
| Benzo[g,h,i]perylene | 0.034 | 0.017 | EPA 8270D/SIM | 8-6-18 | 8-6-18 | |
| <i>Surrogate:</i> | <i>Percent Recovery</i> | <i>Control Limits</i> | | | | |
| <i>2-Fluorophenol</i> | <i>33</i> | <i>19 - 103</i> | | | | |
| <i>Phenol-d6</i> | <i>53</i> | <i>30 - 103</i> | | | | |
| <i>Nitrobenzene-d5</i> | <i>41</i> | <i>27 - 105</i> | | | | |
| <i>2-Fluorobiphenyl</i> | <i>52</i> | <i>36 - 102</i> | | | | |
| <i>2,4,6-Tribromophenol</i> | <i>61</i> | <i>33 - 110</i> | | | | |
| <i>Terphenyl-d14</i> | <i>63</i> | <i>38 - 108</i> | | | | |



Date of Report: October 10, 2018
 Samples Submitted: August 3, 2018
 Laboratory Reference: 1808-051
 Project: 14-05806-000

**SEMIVOLATILES EPA 8270D/SIM
 METHOD BLANK QUALITY CONTROL**

Matrix: Sediment
 Units: mg/Kg

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|-----------------------------|-------------------------|-----------------------|---------------|---------------|---------------|-------|
| Laboratory ID: | MB0806S1 | | | | | |
| Naphthalene | ND | 0.0040 | EPA 8270D/SIM | 8-6-18 | 8-6-18 | |
| 2-Methylnaphthalene | ND | 0.0040 | EPA 8270D/SIM | 8-6-18 | 8-6-18 | |
| 1-Methylnaphthalene | ND | 0.0040 | EPA 8270D/SIM | 8-6-18 | 8-6-18 | |
| Dimethylphthalate | ND | 0.020 | EPA 8270D | 8-6-18 | 8-6-18 | |
| Acenaphthylene | ND | 0.0040 | EPA 8270D/SIM | 8-6-18 | 8-6-18 | |
| Acenaphthene | ND | 0.0040 | EPA 8270D/SIM | 8-6-18 | 8-6-18 | |
| Diethylphthalate | ND | 0.10 | EPA 8270D | 8-6-18 | 8-6-18 | |
| Fluorene | ND | 0.0040 | EPA 8270D/SIM | 8-6-18 | 8-6-18 | |
| Phenanthrene | ND | 0.0040 | EPA 8270D/SIM | 8-6-18 | 8-6-18 | |
| Anthracene | ND | 0.0040 | EPA 8270D/SIM | 8-6-18 | 8-6-18 | |
| Di-n-butylphthalate | ND | 0.10 | EPA 8270D | 8-6-18 | 8-6-18 | |
| Fluoranthene | ND | 0.0040 | EPA 8270D/SIM | 8-6-18 | 8-6-18 | |
| Pyrene | ND | 0.0040 | EPA 8270D/SIM | 8-6-18 | 8-6-18 | |
| Butylbenzylphthalate | ND | 0.10 | EPA 8270D | 8-6-18 | 8-6-18 | |
| Benzo[a]anthracene | ND | 0.0040 | EPA 8270D/SIM | 8-6-18 | 8-6-18 | |
| Chrysene | ND | 0.0040 | EPA 8270D/SIM | 8-6-18 | 8-6-18 | |
| bis(2-Ethylhexyl)phthalate | ND | 0.10 | EPA 8270D | 8-6-18 | 8-6-18 | |
| Di-n-octylphthalate | ND | 0.10 | EPA 8270D | 8-6-18 | 8-6-18 | |
| Benzo[b]fluoranthene | ND | 0.0040 | EPA 8270D/SIM | 8-6-18 | 8-6-18 | |
| Benzo(j,k)fluoranthene | ND | 0.0040 | EPA 8270D/SIM | 8-6-18 | 8-6-18 | |
| Benzo[a]pyrene | ND | 0.0040 | EPA 8270D/SIM | 8-6-18 | 8-6-18 | |
| Indeno[1,2,3-cd]pyrene | ND | 0.0040 | EPA 8270D/SIM | 8-6-18 | 8-6-18 | |
| Dibenz[a,h]anthracene | ND | 0.0040 | EPA 8270D/SIM | 8-6-18 | 8-6-18 | |
| Benzo[g,h,i]perylene | ND | 0.0040 | EPA 8270D/SIM | 8-6-18 | 8-6-18 | |
| <i>Surrogate:</i> | <i>Percent Recovery</i> | <i>Control Limits</i> | | | | |
| <i>2-Fluorophenol</i> | <i>52</i> | <i>19 - 103</i> | | | | |
| <i>Phenol-d6</i> | <i>58</i> | <i>30 - 103</i> | | | | |
| <i>Nitrobenzene-d5</i> | <i>55</i> | <i>27 - 105</i> | | | | |
| <i>2-Fluorobiphenyl</i> | <i>58</i> | <i>36 - 102</i> | | | | |
| <i>2,4,6-Tribromophenol</i> | <i>68</i> | <i>33 - 110</i> | | | | |
| <i>Terphenyl-d14</i> | <i>75</i> | <i>38 - 108</i> | | | | |



Date of Report: October 10, 2018
 Samples Submitted: August 3, 2018
 Laboratory Reference: 1808-051
 Project: 14-05806-000

**SEMIVOLATILES EPA 8270D/SIM
 SB/SBD QUALITY CONTROL**

Matrix: Sediment
 Units: mg/Kg

| Analyte | Result | | Spike Level | | Percent Recovery | | Recovery Limits | RPD | RPD Limit | Flags |
|----------------------------|--------------|--------------|-------------|-------|------------------|-----|-----------------|-----|-----------|-------|
| | SB | SBD | SB | SBD | SB | SBD | | | | |
| SPIKE BLANKS | | | | | | | | | | |
| Laboratory ID: | SB0806S1 | | | | | | | | | |
| Phenol | 0.537 | 0.595 | 0.800 | 0.800 | 67 | 74 | 45 - 94 | 10 | 29 | |
| 2-Chlorophenol | 0.549 | 0.616 | 0.800 | 0.800 | 69 | 77 | 46 - 94 | 12 | 33 | |
| 1,4-Dichlorobenzene | 0.261 | 0.297 | 0.400 | 0.400 | 65 | 74 | 42 - 91 | 13 | 37 | |
| n-Nitroso-di-n-propylamine | 0.281 | 0.304 | 0.400 | 0.400 | 70 | 76 | 45 - 100 | 8 | 26 | |
| 1,2,4-Trichlorobenzene | 0.286 | 0.321 | 0.400 | 0.400 | 72 | 80 | 45 - 100 | 12 | 32 | |
| 4-Chloro-3-methylphenol | 0.617 | 0.702 | 0.800 | 0.800 | 77 | 88 | 55 - 97 | 13 | 21 | |
| Acenaphthene | 0.297 | 0.325 | 0.400 | 0.400 | 74 | 81 | 48 - 91 | 9 | 21 | |
| 4-Nitrophenol | 0.695 | 0.784 | 0.800 | 0.800 | 87 | 98 | 53 - 102 | 12 | 20 | |
| 2,4-Dinitrotoluene | 0.299 | 0.331 | 0.400 | 0.400 | 75 | 83 | 47 - 96 | 10 | 19 | |
| Pentachlorophenol | 0.912 | 0.985 | 0.800 | 0.800 | 114 | 123 | 35 - 125 | 8 | 26 | |
| Pyrene | 0.372 | 0.407 | 0.400 | 0.400 | 93 | 102 | 55 - 110 | 9 | 17 | |
| <i>Surrogate:</i> | | | | | | | | | | |
| 2-Fluorophenol | | | | | 53 | 60 | 19 - 103 | | | |
| Phenol-d6 | | | | | 59 | 63 | 30 - 103 | | | |
| Nitrobenzene-d5 | | | | | 57 | 62 | 27 - 105 | | | |
| 2-Fluorobiphenyl | | | | | 60 | 65 | 36 - 102 | | | |
| 2,4,6-Tribromophenol | | | | | 72 | 75 | 33 - 110 | | | |
| Terphenyl-d14 | | | | | 73 | 79 | 38 - 108 | | | |



Date of Report: October 10, 2018
 Samples Submitted: August 3, 2018
 Laboratory Reference: 1808-051
 Project: 14-05806-000

**TOTAL SOLIDS
 SM 2540G**

Matrix: Sediment
 Units: % Solids

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|-------------------|---------------------|------|----------|---------------|---------------|-------|
| Client ID: | MONT-4M-2018 | | | | | |
| Laboratory ID: | 08-051-01 | | | | | |
| Total Solids | 16 | 0.50 | SM 2540G | 10-5-18 | 10-8-18 | |

| | | | | | | |
|-------------------|---------------------|------|----------|--------|--------|--|
| Client ID: | MONT-4R-2018 | | | | | |
| Laboratory ID: | 08-051-02 | | | | | |
| Total Solids | 19 | 0.50 | SM 2540G | 8-6-18 | 8-8-18 | |

| | | | | | | |
|-------------------|---------------------|------|----------|---------|---------|--|
| Client ID: | MONT-3M-2018 | | | | | |
| Laboratory ID: | 08-051-03 | | | | | |
| Total Solids | 19 | 0.50 | SM 2540G | 10-5-18 | 10-8-18 | |

| | | | | | | |
|-------------------|---------------------|------|----------|--------|--------|--|
| Client ID: | MONT-3R-2018 | | | | | |
| Laboratory ID: | 08-051-04 | | | | | |
| Total Solids | 32 | 0.50 | SM 2540G | 8-6-18 | 8-8-18 | |

| | | | | | | |
|-------------------|------------------|------|----------|---------|---------|--|
| Client ID: | QA-M-2018 | | | | | |
| Laboratory ID: | 08-051-05 | | | | | |
| Total Solids | 22 | 0.50 | SM 2540G | 10-5-18 | 10-8-18 | |

| | | | | | | |
|-------------------|------------------|------|----------|--------|--------|--|
| Client ID: | QA-R-2018 | | | | | |
| Laboratory ID: | 08-051-06 | | | | | |
| Total Solids | 41 | 0.50 | SM 2540G | 8-6-18 | 8-8-18 | |

| | | | | | | |
|-------------------|---------------------|------|----------|---------|---------|--|
| Client ID: | TYLR-2M-2018 | | | | | |
| Laboratory ID: | 08-051-07 | | | | | |
| Total Solids | 22 | 0.50 | SM 2540G | 10-5-18 | 10-8-18 | |



Date of Report: October 10, 2018
 Samples Submitted: August 3, 2018
 Laboratory Reference: 1808-051
 Project: 14-05806-000

**TOTAL SOLIDS
 SM 2540G**

Matrix: Sediment
 Units: % Solids

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|-------------------|---------------------|------|----------|---------------|---------------|-------|
| Client ID: | TYLR-2R-2018 | | | | | |
| Laboratory ID: | 08-051-08 | | | | | |
| Total Solids | 35 | 0.50 | SM 2540G | 8-6-18 | 8-8-18 | |

| | | | | | | |
|-------------------|---------------------|------|----------|---------|---------|--|
| Client ID: | TOSH-1M-2018 | | | | | |
| Laboratory ID: | 08-051-09 | | | | | |
| Total Solids | 44 | 0.50 | SM 2540G | 10-5-18 | 10-8-18 | |

| | | | | | | |
|-------------------|---------------------|------|----------|--------|--------|--|
| Client ID: | TOSH-1R-2018 | | | | | |
| Laboratory ID: | 08-051-10 | | | | | |
| Total Solids | 48 | 0.50 | SM 2540G | 8-6-18 | 8-8-18 | |



Date of Report: October 10, 2018
 Samples Submitted: August 3, 2018
 Laboratory Reference: 1808-051
 Project: 14-05806-000

**TOTAL SOLIDS
 SM 2540G
 QUALITY CONTROL**

Matrix: Sediment
 Units: % Solids

| Analyte | Result | | Spike Level | Source Result | Percent Recovery | Recovery Limits | RPD | RPD Limit | Flags |
|------------------|---------------|-------------|--------------------|----------------------|-------------------------|------------------------|------------|------------------|--------------|
| DUPLICATE | | | | | | | | | |
| Laboratory ID: | 08-051-10 | | | | | | | | |
| | ORIG | DUP | | | | | | | |
| Total Solids | 48.0 | 54.2 | NA | NA | NA | NA | 12 | 20 | |
| Laboratory ID: | 08-260-05 | | | | | | | | |
| | ORIG | DUP | | | | | | | |
| Total Solids | 31.6 | 44.3 | NA | NA | NA | NA | 33 | 20 | |





Data Qualifiers and Abbreviations

- A - Due to a high sample concentration, the amount spiked is insufficient for meaningful MS/MSD recovery data.
 - B - The analyte indicated was also found in the blank sample.
 - C - The duplicate RPD is outside control limits due to high result variability when analyte concentrations are within five times the quantitation limit.
 - E - The value reported exceeds the quantitation range and is an estimate.
 - F - Surrogate recovery data is not available due to the high concentration of coeluting target compounds.
 - H - The analyte indicated is a common laboratory solvent and may have been introduced during sample preparation, and be impacting the sample result.
 - I - Compound recovery is outside of the control limits.
 - J - The value reported was below the practical quantitation limit. The value is an estimate.
 - K - Sample duplicate RPD is outside control limits due to sample inhomogeneity. The sample was re-extracted and re-analyzed with similar results.
 - L - The RPD is outside of the control limits.
 - M - Hydrocarbons in the gasoline range are impacting the diesel range result.
 - M1 - Hydrocarbons in the gasoline range (toluene-naphthalene) are present in the sample.
 - N - Hydrocarbons in the lube oil range are impacting the diesel range result.
 - N1 - Hydrocarbons in diesel range are impacting lube oil range results.
 - O - Hydrocarbons indicative of heavier fuels are present in the sample and are impacting the gasoline result.
 - P - The RPD of the detected concentrations between the two columns is greater than 40.
 - Q - Surrogate recovery is outside of the control limits.
 - S - Surrogate recovery data is not available due to the necessary dilution of the sample.
 - T - The sample chromatogram is not similar to a typical _____.
 - U - The analyte was analyzed for, but was not detected above the reported sample quantitation limit.
 - U1 - The practical quantitation limit is elevated due to interferences present in the sample.
 - V - Matrix Spike/Matrix Spike Duplicate recoveries are outside control limits due to matrix effects.
 - W - Matrix Spike/Matrix Spike Duplicate RPD are outside control limits due to matrix effects.
 - X - Sample extract treated with a mercury cleanup procedure.
 - X1 - Sample extract treated with a Sulfuric acid/Silica gel cleanup procedure.
 - Y - The calibration verification for this analyte exceeded the 20% drift specified in method 8260C, and therefore the reported result should be considered an estimate. The overall performance of the calibration verification standard met the acceptance criteria of the method.
 - Z -
- ND - Not Detected at PQL
 PQL - Practical Quantitation Limit
 RPD - Relative Percent Difference





CHAIN OF CUSTODY

14648 NE 95th Street, Redmond, WA 98052
 Telephone: 425.883.3881

Company: Herrera Environmental Consultants
 Project No.: 14-05806-000
 Project Name: Redmond Paired Watershed Study
 Project Manager: John Lenth

Turnaround Requested:

_____ 1 Day
 _____ 2 Day
 _____ 3 Day
 Standard

Laboratory No.

08-051 Requested Analyses

| | | | | | | | | | | | | | | | | | | | | |
|----------------------|--------|------|----------------------------------|------------|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--------------|
| Total Organic Carbon | Copper | Zinc | Polycyclic aromatic hydrocarbons | Phthalates | | | | | | | | | | | | | | | | Total Solids |
|----------------------|--------|------|----------------------------------|------------|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--------------|

| Lab ID | Sample Identification | Date Sampled | Time Sampled | Matrix | # of Cont. | Total Organic Carbon | Copper | Zinc | Polycyclic aromatic hydrocarbons | Phthalates | | | | | | | | | | | Total Solids |
|--------|-----------------------|--------------|--------------|----------|------------|----------------------|--------|------|----------------------------------|------------|--|--|--|--|--|--|--|--|--|--|--------------|
| 1 | MONT-4M-2018 | 7-25-18 | 1156 | Sediment | 1 | | X | X | | | | | | | | | | | | | X |
| 2 | MONT-4R-2018 | 7-25-18 | 1150 | Sediment | 1 | X | | | X | X | | | | | | | | | | | X |
| 3 | MONT-3M-2018 | 7-26-18 | 1223 | Sediment | 1 | | X | X | | | | | | | | | | | | | X |
| 4 | MONT-3R-2018 | 7-26-18 | 1223 | Sediment | 1 | X | | | X | X | | | | | | | | | | | X |
| 5 | QA-M-2018 | 7-26-18 | 1223 | Sediment | 1 | | X | X | | | | | | | | | | | | | X |
| 6 | QA-R-2018 | 7-26-18 | 1223 | Sediment | 1 | X | | | X | X | | | | | | | | | | | X |
| 7 | TYLR-2M-2018 | 8-2-18 | 1226 | Sediment | 1 | | X | X | | | | | | | | | | | | | X |
| 8 | TYLR-2R-2018 | 8-2-18 | 1226 | Sediment | 1 | X | | | X | X | | | | | | | | | | | X |
| 9 | TOSH-1M-2018 | 8-3-18 | 1135 | Sediment | 1 | | X | X | | | | | | | | | | | | | X |
| 10 | TOSH-1R-2018 | 8-3-18 | 1135 | Sediment | 1 | X | | | X | X | | | | | | | | | | | X |
| | | | | Sediment | 1 | | | | | | | | | | | | | | | | |
| | | | | Sediment | 1 | | | | | | | | | | | | | | | | |
| | | | | Sediment | 1 | | | | | | | | | | | | | | | | |
| | | | | Sediment | 1 | | | | | | | | | | | | | | | | |
| | | | | Sediment | 1 | | | | | | | | | | | | | | | | |
| | | | | Sediment | 1 | | | | | | | | | | | | | | | | |

Relinquished by Mamun Date 8/3/18 Received by Walter Liser Date 8/3/18
 Firm HEC Time 1530 Firm OSE Time 1530

Relinquished by _____ Date _____ Received by _____ Date _____
 Firm _____ Time _____ Firm _____ Time _____

Comments:



Data Quality Assurance Worksheet

Project Name/No./Client: Redmond Paired Watershed Study / 14-05806-000 / City of Redmond
 Laboratory/Parameters: OnSite Environmental : TOC, Cu, Zn, PAHs, phthalates
 Sample Date/Sample ID: 7/25 - 8/03/2018 / MONT-4, MONT-3, TYLR-2, TOSH-1, QA (field dup of MONT-3)

By G. Catarra
 Date 10/17/2018 Page 1 of 1
 Checked: initials JL
 date 10/18/2018

| Parameter | Completeness/ Methodology | Pre-extraction Holding Times (minutes) | | Total Holding Times (days) | | Method Blanks Reporting Limit | Matrix Spikes/ Surrogate Recovery (%) | | Lab Control Samples Recovery (%) | | Lab Duplicates RPD (%) | | Field Duplicates RPD (%) | | Instrument Calibration/ Performance | ACTION |
|------------|------------------------------|--|------|-------------------------------|------|--|---|--------------------|--|------------|---------------------------|-------------------|-----------------------------|-------------------|---|-----------------------------------|
| | | Reported | Goal | Reported | Goal | | Reported | Goal | Reported | Goal | Reported | Goal ¹ | Reported | Goal ¹ | | |
| TOC | OK / EPA 9060A | NA | NA | 17-26 | ≤14 | ≤0.05% 0.05 % | NA | NA | 113 | ±20 | 4 | ≤20 | 20 | ≤35 | OK | NONE. EPA HOLDING TIME 28 DAYS |
| Copper | OK / EPA 6020 | NA | NA | 61-70 | ≤180 | ≤1.0 MG/KG 1.0 MG/KG | 102,102 | ±25 | NR | ±15 | 2 | ≤20 | 22 | ≤35 | OK | NONE |
| Zinc | OK / EPA 6020 | NA | NA | 61-70 | ≤180 | ≤2.5 mg/kg 2.5 MG/KG | 99,98 | ±25 | NR | ±15 | 0 | ≤20 | 26 | ≤35 | OK | NONE |
| PAHs | OK / EPA 8270D/SIM | 3-12 | ≤14 | 1 | ≤40 | ≤20 ug/kg 16-20 UG/KG | NR | NA / 21- 120 | 65-123 | 25- 141 | BS/BSD 8-13 | ≤40 | D=0.009 - 0.010 | ≤50 | OK | NONE |
| Phthalates | OK / EPA 8270D | 3-12 | ≤14 | 1 | ≤40 | ≤0.1 MG/KG 2-2.5 MG/KG | NR | NA / 21- 120 | 65-123 | 25- 141 | BS/BSD 8-13 | ≤40 | NC | ≤50 | OK | NONE |

¹ If the sample or duplicate value is less than five times the reporting limit, the difference is calculated rather than the relative percent difference (RPD). The QA goal is a difference <2 times the detection limit instead of the number indicated in the goal column.

NA – not applicable or not available; NC – not calculable due to one or more values below the detection limit; NS – field duplicate not sampled.



14648 NE 95th Street, Redmond, WA 98052 • (425) 883-3881

October 10, 2018

John Lenth
Herrera Environmental Consultants, Inc.
2200 6th Avenue, Suite 1100
Seattle, WA 98121

Re: Analytical Data for Project 14-05806-000
Laboratory Reference No. 1808-260

Dear John:

Enclosed are the analytical results and associated quality control data for samples submitted on August 23, 2018.

The standard policy of OnSite Environmental, Inc. is to store your samples for 30 days from the date of receipt. If you require longer storage, please contact the laboratory.

We appreciate the opportunity to be of service to you on this project. If you have any questions concerning the data, or need additional information, please feel free to call me.

Sincerely,

A handwritten signature in black ink, appearing to read "Blair Goodrow", enclosed within a large, loopy circular flourish.

Blair Goodrow
Project Manager

Enclosures



OnSite Environmental, Inc. 14648 NE 95th Street, Redmond, WA 98052 (425) 883-3881

This report pertains to the samples analyzed in accordance with the chain of custody, and is intended only for the use of the individual or company to whom it is addressed.

Date of Report: October 10, 2018
Samples Submitted: August 23, 2018
Laboratory Reference: 1808-260
Project: 14-05806-000

Case Narrative

Samples were collected on August 9, 22, and 23, 2018 and received by the laboratory on August 23, 2018. They were maintained at the laboratory at a temperature of 2°C to 6°C.

Please note that any and all soil sample results are reported on a dry-weight basis, unless otherwise noted below.

General QA/QC issues associated with the analytical data enclosed in this laboratory report will be indicated with a reference to a comment or explanation on the Data Qualifier page. More complex and involved QA/QC issues will be discussed in detail below.

Semivolatiles EPA 8270D/SIM Analysis

Per client's request, sample CTRY-2R-2018 was extracted and analyzed out of hold-time.

Total Solids SM 2540G Analysis

The duplicate RPD for Total Solids, effecting samples CTRY-2M-2018, CTRY-1M-2018, and SIDL-2M-2018, is outside control limits due to sample inhomogeneity.

Please note that any other QA/QC issues associated with these extractions and analyses will be indicated with a footnote reference and discussed in detail on the Data Qualifier page.



Date of Report: October 10, 2018
 Samples Submitted: August 23, 2018
 Laboratory Reference: 1808-260
 Project: 14-05806-000

**TOTAL ORGANIC CARBON
 EPA 9060A**

Matrix: Sediment
 Units: % Carbon

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|----------------------|---------------------|------------|---------------|----------------------|----------------------|--------------|
| Client ID: | CTRY-2R-2018 | | | | | |
| Laboratory ID: | 08-260-02 | | | | | |
| Total Organic Carbon | 3.7 | 0.18 | EPA 9060 | 9-5-18 | 9-5-18 | |
| Client ID: | CTRY-1R-2018 | | | | | |
| Laboratory ID: | 08-260-04 | | | | | |
| Total Organic Carbon | 9.0 | 0.25 | EPA 9060 | 9-5-18 | 9-5-18 | |
| Client ID: | SIDL-2R-2018 | | | | | |
| Laboratory ID: | 08-260-06 | | | | | |
| Total Organic Carbon | 2.3 | 0.095 | EPA 9060 | 9-5-18 | 9-5-18 | |



Date of Report: October 10, 2018
 Samples Submitted: August 23, 2018
 Laboratory Reference: 1808-260
 Project: 14-05806-000

**TOTAL ORGANIC CARBON
 EPA 9060A
 QUALITY CONTROL**

Matrix: Sediment
 Units: % Carbon

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|----------------------|-----------|-------|----------|---------------|---------------|-------|
| METHOD BLANK | | | | | | |
| Laboratory ID: | MB0905S1 | | | | | |
| Total Organic Carbon | ND | 0.042 | EPA 9060 | 9-5-18 | 9-5-18 | |

| Analyte | Result | Spike Level | Source Result | Percent Recovery | Recovery Limits | RPD | RPD Limit | Flags |
|----------------------|---------------|---------------|---------------|------------------|-----------------|-----|-----------|-------|
| DUPLICATE | | | | | | | | |
| Laboratory ID: | 08-311-04 | | | | | | | |
| | ORIG | DUP | | | | | | |
| Total Organic Carbon | 0.0580 | 0.0614 | NA | NA | NA | NA | 6 | 28 |

| | | | | | | | | |
|----------------------|-------------|------|----|-----|---------|----|----|--|
| SPIKE BLANK | | | | | | | | |
| Laboratory ID: | SB0905S1 | | | | | | | |
| | SB | SB | | SB | | | | |
| Total Organic Carbon | 42.2 | 42.1 | NA | 100 | 102-119 | NA | NA | |



Date of Report: October 10, 2018
 Samples Submitted: August 23, 2018
 Laboratory Reference: 1808-260
 Project: 14-05806-000

**TOTAL METALS
 EPA 6010D**

Matrix: Sediment
 Units: mg/Kg (ppm)

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|-------------------|---------------------|-----|-----------|---------------|---------------|-------|
| Client ID: | CTRY-2M-2018 | | | | | |
| Laboratory ID: | 08-260-01 | | | | | |
| Copper | 27 | 2.6 | EPA 6010D | 10-3-18 | 10-4-18 | |
| Zinc | 90 | 6.5 | EPA 6010D | 10-3-18 | 10-4-18 | |

| | | | | | | |
|-------------------|---------------------|-----|-----------|---------|---------|--|
| Client ID: | CTRY-1M-2018 | | | | | |
| Laboratory ID: | 08-260-03 | | | | | |
| Copper | 45 | 3.5 | EPA 6010D | 10-3-18 | 10-4-18 | |
| Zinc | 440 | 8.8 | EPA 6010D | 10-3-18 | 10-4-18 | |

| | | | | | | |
|-------------------|---------------------|-----|-----------|---------|---------|--|
| Client ID: | SIDL-2M-2018 | | | | | |
| Laboratory ID: | 08-260-05 | | | | | |
| Copper | 40 | 3.2 | EPA 6010D | 10-3-18 | 10-4-18 | |
| Zinc | 80 | 7.9 | EPA 6010D | 10-3-18 | 10-4-18 | |



Date of Report: October 10, 2018
 Samples Submitted: August 23, 2018
 Laboratory Reference: 1808-260
 Project: 14-05806-000

**TOTAL METALS
 EPA 6010D
 QUALITY CONTROL**

Matrix: Sediment
 Units: mg/Kg (ppm)

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|---------------------|-----------|-----|-----------|---------------|---------------|-------|
| METHOD BLANK | | | | | | |
| Laboratory ID: | MB1003SM4 | | | | | |
| Copper | ND | 1.0 | EPA 6010D | 10-3-18 | 10-3-18 | |
| Zinc | ND | 2.5 | EPA 6010D | 10-3-18 | 10-3-18 | |

| Analyte | Result | Spike Level | Source Result | Percent Recovery | Recovery Limits | RPD | RPD Limit | Flags |
|------------------|-------------|-------------|---------------|------------------|-----------------|-----|-----------|-------|
| DUPLICATE | | | | | | | | |
| Laboratory ID: | 08-051-01 | | | | | | | |
| | ORIG | DUP | | | | | | |
| Copper | 8.90 | 8.75 | NA | NA | NA | NA | 2 | 20 |
| Zinc | 65.3 | 65.0 | NA | NA | NA | NA | 0 | 20 |

MATRIX SPIKES

| Laboratory ID: | MS | MSD | MS | MSD | MS | MSD | MS | MSD | RPD | RPD Limit | Flags |
|----------------|-------------|-------------|------|------|------|------------|------------|--------|-----|-----------|-------|
| Laboratory ID: | 08-051-01 | | | | | | | | | | |
| | MS | MSD | MS | MSD | MS | MSD | MS | MSD | | | |
| Copper | 60.1 | 59.9 | 50.0 | 50.0 | 8.90 | 102 | 102 | 75-125 | 0 | 20 | |
| Zinc | 164 | 163 | 100 | 100 | 65.3 | 99 | 98 | 75-125 | 1 | 20 | |



Date of Report: October 10, 2018
 Samples Submitted: August 23, 2018
 Laboratory Reference: 1808-260
 Project: 14-05806-000

SEMIVOLATILES EPA 8270D/SIM

Matrix: Sediment
 Units: mg/Kg

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|-----------------------------|-------------------------|-----------------------|---------------|---------------|---------------|-------|
| Client ID: | CTRY-2R-2018 | | | | | |
| Laboratory ID: | 08-260-02 | | | | | |
| Naphthalene | 0.015 | 0.0086 | EPA 8270D/SIM | 9-5-18 | 9-5-18 | |
| 2-Methylnaphthalene | 0.013 | 0.0086 | EPA 8270D/SIM | 9-5-18 | 9-5-18 | |
| 1-Methylnaphthalene | 0.020 | 0.0086 | EPA 8270D/SIM | 9-5-18 | 9-5-18 | |
| Dimethylphthalate | ND | 0.043 | EPA 8270D | 9-5-18 | 9-5-18 | |
| Acenaphthylene | 0.032 | 0.0086 | EPA 8270D/SIM | 9-5-18 | 9-5-18 | |
| Acenaphthene | 0.034 | 0.0086 | EPA 8270D/SIM | 9-5-18 | 9-5-18 | |
| Diethylphthalate | ND | 0.21 | EPA 8270D | 9-5-18 | 9-5-18 | |
| Fluorene | 0.073 | 0.043 | EPA 8270D | 9-5-18 | 9-5-18 | |
| Phenanthrene | 0.56 | 0.043 | EPA 8270D | 9-5-18 | 9-5-18 | |
| Anthracene | 0.12 | 0.043 | EPA 8270D | 9-5-18 | 9-5-18 | |
| Di-n-butylphthalate | 1.0 | 0.21 | EPA 8270D | 9-5-18 | 9-5-18 | |
| Fluoranthene | 0.33 | 0.043 | EPA 8270D | 9-5-18 | 9-5-18 | |
| Pyrene | 0.47 | 0.043 | EPA 8270D | 9-5-18 | 9-5-18 | |
| Butylbenzylphthalate | ND | 0.21 | EPA 8270D | 9-5-18 | 9-5-18 | |
| Benzo[a]anthracene | 0.17 | 0.043 | EPA 8270D | 9-5-18 | 9-5-18 | |
| Chrysene | 0.17 | 0.043 | EPA 8270D | 9-5-18 | 9-5-18 | |
| bis(2-Ethylhexyl)phthalate | ND | 0.21 | EPA 8270D | 9-5-18 | 9-5-18 | |
| Di-n-octylphthalate | ND | 0.21 | EPA 8270D | 9-5-18 | 9-5-18 | |
| Benzo[b]fluoranthene | 0.13 | 0.043 | EPA 8270D | 9-5-18 | 9-5-18 | |
| Benzo(j,k)fluoranthene | 0.047 | 0.043 | EPA 8270D | 9-5-18 | 9-5-18 | |
| Benzo[a]pyrene | 0.15 | 0.043 | EPA 8270D | 9-5-18 | 9-5-18 | |
| Indeno[1,2,3-cd]pyrene | 0.069 | 0.043 | EPA 8270D | 9-5-18 | 9-5-18 | |
| Dibenz[a,h]anthracene | 0.011 | 0.0086 | EPA 8270D/SIM | 9-5-18 | 9-5-18 | |
| Benzo[g,h,i]perylene | 0.072 | 0.043 | EPA 8270D | 9-5-18 | 9-5-18 | |
| <i>Surrogate:</i> | <i>Percent Recovery</i> | <i>Control Limits</i> | | | | |
| <i>2-Fluorophenol</i> | <i>54</i> | <i>19 - 103</i> | | | | |
| <i>Phenol-d6</i> | <i>61</i> | <i>30 - 103</i> | | | | |
| <i>Nitrobenzene-d5</i> | <i>60</i> | <i>27 - 105</i> | | | | |
| <i>2-Fluorobiphenyl</i> | <i>71</i> | <i>36 - 102</i> | | | | |
| <i>2,4,6-Tribromophenol</i> | <i>95</i> | <i>33 - 110</i> | | | | |
| <i>Terphenyl-d14</i> | <i>94</i> | <i>38 - 108</i> | | | | |



Date of Report: October 10, 2018
 Samples Submitted: August 23, 2018
 Laboratory Reference: 1808-260
 Project: 14-05806-000

SEMIVOLATILES EPA 8270D/SIM

Matrix: Sediment
 Units: mg/Kg

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|-----------------------------|-------------------------|-----------------------|---------------|---------------|---------------|-------|
| Client ID: | CTRY-1R-2018 | | | | | |
| Laboratory ID: | 08-260-04 | | | | | |
| Naphthalene | ND | 0.014 | EPA 8270D/SIM | 9-5-18 | 9-5-18 | |
| 2-Methylnaphthalene | ND | 0.014 | EPA 8270D/SIM | 9-5-18 | 9-5-18 | |
| 1-Methylnaphthalene | ND | 0.014 | EPA 8270D/SIM | 9-5-18 | 9-5-18 | |
| Dimethylphthalate | ND | 0.35 | EPA 8270D | 9-5-18 | 9-5-18 | |
| Acenaphthylene | ND | 0.014 | EPA 8270D/SIM | 9-5-18 | 9-5-18 | |
| Acenaphthene | ND | 0.014 | EPA 8270D/SIM | 9-5-18 | 9-5-18 | |
| Diethylphthalate | ND | 1.8 | EPA 8270D | 9-5-18 | 9-5-18 | |
| Fluorene | 0.022 | 0.014 | EPA 8270D/SIM | 9-5-18 | 9-5-18 | |
| Phenanthrene | 0.30 | 0.014 | EPA 8270D/SIM | 9-5-18 | 9-5-18 | |
| Anthracene | 0.053 | 0.014 | EPA 8270D/SIM | 9-5-18 | 9-5-18 | |
| Di-n-butylphthalate | ND | 1.8 | EPA 8270D | 9-5-18 | 9-5-18 | |
| Fluoranthene | 0.64 | 0.35 | EPA 8270D | 9-5-18 | 9-5-18 | |
| Pyrene | 0.59 | 0.35 | EPA 8270D | 9-5-18 | 9-5-18 | |
| Butylbenzylphthalate | ND | 1.8 | EPA 8270D | 9-5-18 | 9-5-18 | |
| Benzo[a]anthracene | 0.25 | 0.014 | EPA 8270D/SIM | 9-5-18 | 9-5-18 | |
| Chrysene | 0.29 | 0.014 | EPA 8270D/SIM | 9-5-18 | 9-5-18 | |
| bis(2-Ethylhexyl)phthalate | ND | 1.8 | EPA 8270D | 9-5-18 | 9-5-18 | |
| Di-n-octylphthalate | ND | 1.8 | EPA 8270D | 9-5-18 | 9-5-18 | |
| Benzo[b]fluoranthene | 0.38 | 0.35 | EPA 8270D | 9-5-18 | 9-5-18 | |
| Benzo(j,k)fluoranthene | 0.098 | 0.014 | EPA 8270D/SIM | 9-5-18 | 9-5-18 | |
| Benzo[a]pyrene | 0.25 | 0.014 | EPA 8270D/SIM | 9-5-18 | 9-5-18 | |
| Indeno[1,2,3-cd]pyrene | 0.20 | 0.014 | EPA 8270D/SIM | 9-5-18 | 9-5-18 | |
| Dibenz[a,h]anthracene | 0.031 | 0.014 | EPA 8270D/SIM | 9-5-18 | 9-5-18 | |
| Benzo[g,h,i]perylene | 0.20 | 0.014 | EPA 8270D/SIM | 9-5-18 | 9-5-18 | |
| <i>Surrogate:</i> | <i>Percent Recovery</i> | <i>Control Limits</i> | | | | |
| <i>2-Fluorophenol</i> | <i>56</i> | <i>19 - 103</i> | | | | |
| <i>Phenol-d6</i> | <i>65</i> | <i>30 - 103</i> | | | | |
| <i>Nitrobenzene-d5</i> | <i>60</i> | <i>27 - 105</i> | | | | |
| <i>2-Fluorobiphenyl</i> | <i>72</i> | <i>36 - 102</i> | | | | |
| <i>2,4,6-Tribromophenol</i> | <i>78</i> | <i>33 - 110</i> | | | | |
| <i>Terphenyl-d14</i> | <i>81</i> | <i>38 - 108</i> | | | | |



Date of Report: October 10, 2018
 Samples Submitted: August 23, 2018
 Laboratory Reference: 1808-260
 Project: 14-05806-000

SEMIVOLATILES EPA 8270D/SIM

Matrix: Sediment
 Units: mg/Kg

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|-----------------------------|-------------------------|-----------------------|---------------|---------------|---------------|-------|
| Client ID: | SIDL-2R-2018 | | | | | |
| Laboratory ID: | 08-260-06 | | | | | |
| Naphthalene | ND | 0.013 | EPA 8270D/SIM | 9-5-18 | 9-5-18 | |
| 2-Methylnaphthalene | ND | 0.013 | EPA 8270D/SIM | 9-5-18 | 9-5-18 | |
| 1-Methylnaphthalene | ND | 0.013 | EPA 8270D/SIM | 9-5-18 | 9-5-18 | |
| Dimethylphthalate | ND | 0.064 | EPA 8270D | 9-5-18 | 9-5-18 | |
| Acenaphthylene | ND | 0.013 | EPA 8270D/SIM | 9-5-18 | 9-5-18 | |
| Acenaphthene | ND | 0.013 | EPA 8270D/SIM | 9-5-18 | 9-5-18 | |
| Diethylphthalate | ND | 0.32 | EPA 8270D | 9-5-18 | 9-5-18 | |
| Fluorene | ND | 0.013 | EPA 8270D/SIM | 9-5-18 | 9-5-18 | |
| Phenanthrene | ND | 0.013 | EPA 8270D/SIM | 9-5-18 | 9-5-18 | |
| Anthracene | ND | 0.013 | EPA 8270D/SIM | 9-5-18 | 9-5-18 | |
| Di-n-butylphthalate | 1.3 | 0.32 | EPA 8270D | 9-5-18 | 9-5-18 | |
| Fluoranthene | ND | 0.013 | EPA 8270D/SIM | 9-5-18 | 9-5-18 | |
| Pyrene | ND | 0.013 | EPA 8270D/SIM | 9-5-18 | 9-5-18 | |
| Butylbenzylphthalate | ND | 0.32 | EPA 8270D | 9-5-18 | 9-5-18 | |
| Benzo[a]anthracene | ND | 0.013 | EPA 8270D/SIM | 9-5-18 | 9-5-18 | |
| Chrysene | ND | 0.013 | EPA 8270D/SIM | 9-5-18 | 9-5-18 | |
| bis(2-Ethylhexyl)phthalate | ND | 0.32 | EPA 8270D | 9-5-18 | 9-5-18 | |
| Di-n-octylphthalate | ND | 0.32 | EPA 8270D | 9-5-18 | 9-5-18 | |
| Benzo[b]fluoranthene | ND | 0.013 | EPA 8270D/SIM | 9-5-18 | 9-5-18 | |
| Benzo(j,k)fluoranthene | ND | 0.013 | EPA 8270D/SIM | 9-5-18 | 9-5-18 | |
| Benzo[a]pyrene | ND | 0.013 | EPA 8270D/SIM | 9-5-18 | 9-5-18 | |
| Indeno[1,2,3-cd]pyrene | ND | 0.013 | EPA 8270D/SIM | 9-5-18 | 9-5-18 | |
| Dibenz[a,h]anthracene | ND | 0.013 | EPA 8270D/SIM | 9-5-18 | 9-5-18 | |
| Benzo[g,h,i]perylene | ND | 0.013 | EPA 8270D/SIM | 9-5-18 | 9-5-18 | |
| <i>Surrogate:</i> | <i>Percent Recovery</i> | <i>Control Limits</i> | | | | |
| <i>2-Fluorophenol</i> | <i>53</i> | <i>19 - 103</i> | | | | |
| <i>Phenol-d6</i> | <i>66</i> | <i>30 - 103</i> | | | | |
| <i>Nitrobenzene-d5</i> | <i>59</i> | <i>27 - 105</i> | | | | |
| <i>2-Fluorobiphenyl</i> | <i>74</i> | <i>36 - 102</i> | | | | |
| <i>2,4,6-Tribromophenol</i> | <i>90</i> | <i>33 - 110</i> | | | | |
| <i>Terphenyl-d14</i> | <i>85</i> | <i>38 - 108</i> | | | | |



Date of Report: October 10, 2018
 Samples Submitted: August 23, 2018
 Laboratory Reference: 1808-260
 Project: 14-05806-000

**SEMIVOLATILES EPA 8270D/SIM
 METHOD BLANK QUALITY CONTROL**

Matrix: Sediment
 Units: mg/Kg

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|-----------------------------|-------------------------|-----------------------|---------------|---------------|---------------|-------|
| Laboratory ID: | MB0905S1 | | | | | |
| Naphthalene | ND | 0.0040 | EPA 8270D/SIM | 9-5-18 | 9-5-18 | |
| 2-Methylnaphthalene | ND | 0.0040 | EPA 8270D/SIM | 9-5-18 | 9-5-18 | |
| 1-Methylnaphthalene | ND | 0.0040 | EPA 8270D/SIM | 9-5-18 | 9-5-18 | |
| Dimethylphthalate | ND | 0.020 | EPA 8270D | 9-5-18 | 9-5-18 | |
| Acenaphthylene | ND | 0.0040 | EPA 8270D/SIM | 9-5-18 | 9-5-18 | |
| Acenaphthene | ND | 0.0040 | EPA 8270D/SIM | 9-5-18 | 9-5-18 | |
| Diethylphthalate | ND | 0.10 | EPA 8270D | 9-5-18 | 9-5-18 | |
| Fluorene | ND | 0.0040 | EPA 8270D/SIM | 9-5-18 | 9-5-18 | |
| Phenanthrene | ND | 0.0040 | EPA 8270D/SIM | 9-5-18 | 9-5-18 | |
| Anthracene | ND | 0.0040 | EPA 8270D/SIM | 9-5-18 | 9-5-18 | |
| Di-n-butylphthalate | ND | 0.10 | EPA 8270D | 9-5-18 | 9-5-18 | |
| Fluoranthene | ND | 0.0040 | EPA 8270D/SIM | 9-5-18 | 9-5-18 | |
| Pyrene | ND | 0.0040 | EPA 8270D/SIM | 9-5-18 | 9-5-18 | |
| Butylbenzylphthalate | ND | 0.10 | EPA 8270D | 9-5-18 | 9-5-18 | |
| Benzo[a]anthracene | ND | 0.0040 | EPA 8270D/SIM | 9-5-18 | 9-5-18 | |
| Chrysene | ND | 0.0040 | EPA 8270D/SIM | 9-5-18 | 9-5-18 | |
| bis(2-Ethylhexyl)phthalate | ND | 0.10 | EPA 8270D | 9-5-18 | 9-5-18 | |
| Di-n-octylphthalate | ND | 0.10 | EPA 8270D | 9-5-18 | 9-5-18 | |
| Benzo[b]fluoranthene | ND | 0.0040 | EPA 8270D/SIM | 9-5-18 | 9-5-18 | |
| Benzo[j,k]fluoranthene | ND | 0.0040 | EPA 8270D/SIM | 9-5-18 | 9-5-18 | |
| Benzo[a]pyrene | ND | 0.0040 | EPA 8270D/SIM | 9-5-18 | 9-5-18 | |
| Indeno[1,2,3-cd]pyrene | ND | 0.0040 | EPA 8270D/SIM | 9-5-18 | 9-5-18 | |
| Dibenz[a,h]anthracene | ND | 0.0040 | EPA 8270D/SIM | 9-5-18 | 9-5-18 | |
| Benzo[g,h,i]perylene | ND | 0.0040 | EPA 8270D/SIM | 9-5-18 | 9-5-18 | |
| <i>Surrogate:</i> | <i>Percent Recovery</i> | <i>Control Limits</i> | | | | |
| <i>2-Fluorophenol</i> | <i>58</i> | <i>19 - 103</i> | | | | |
| <i>Phenol-d6</i> | <i>63</i> | <i>30 - 103</i> | | | | |
| <i>Nitrobenzene-d5</i> | <i>59</i> | <i>27 - 105</i> | | | | |
| <i>2-Fluorobiphenyl</i> | <i>68</i> | <i>36 - 102</i> | | | | |
| <i>2,4,6-Tribromophenol</i> | <i>90</i> | <i>33 - 110</i> | | | | |
| <i>Terphenyl-d14</i> | <i>94</i> | <i>38 - 108</i> | | | | |



Date of Report: October 10, 2018
 Samples Submitted: August 23, 2018
 Laboratory Reference: 1808-260
 Project: 14-05806-000

**SEMIVOLATILES EPA 8270D/SIM
 SB/SBD QUALITY CONTROL**

Matrix: Sediment
 Units: mg/Kg

| Analyte | Result | | Spike Level | | Percent Recovery | | Recovery | RPD | RPD | Flags |
|-----------------------------|--------------|--------------|-------------|-------|------------------|-----------|-----------------|-----|-----|-------|
| | | | | | Recovery | Limits | Limit | | | |
| SPIKE BLANKS | | | | | | | | | | |
| Laboratory ID: | SB0905S1 | | | | | | | | | |
| | SB | SBD | SB | SBD | SB | SBD | | | | |
| Phenol | 0.511 | 0.525 | 0.800 | 0.800 | 64 | 66 | 45 - 94 | 3 | 29 | |
| 2-Chlorophenol | 0.479 | 0.497 | 0.800 | 0.800 | 60 | 62 | 46 - 94 | 4 | 33 | |
| 1,4-Dichlorobenzene | 0.228 | 0.230 | 0.400 | 0.400 | 57 | 58 | 42 - 91 | 1 | 37 | |
| n-Nitroso-di-n-propylamine | 0.241 | 0.253 | 0.400 | 0.400 | 60 | 63 | 45 - 100 | 5 | 26 | |
| 1,2,4-Trichlorobenzene | 0.246 | 0.244 | 0.400 | 0.400 | 62 | 61 | 45 - 100 | 1 | 32 | |
| 4-Chloro-3-methylphenol | 0.607 | 0.637 | 0.800 | 0.800 | 76 | 80 | 55 - 97 | 5 | 21 | |
| Acenaphthene | 0.273 | 0.283 | 0.400 | 0.400 | 68 | 71 | 48 - 91 | 4 | 21 | |
| 4-Nitrophenol | 0.650 | 0.671 | 0.800 | 0.800 | 81 | 84 | 53 - 102 | 3 | 20 | |
| 2,4-Dinitrotoluene | 0.310 | 0.328 | 0.400 | 0.400 | 78 | 82 | 47 - 96 | 6 | 19 | |
| Pentachlorophenol | 0.772 | 0.788 | 0.800 | 0.800 | 97 | 99 | 35 - 125 | 2 | 26 | |
| Pyrene | 0.347 | 0.363 | 0.400 | 0.400 | 87 | 91 | 55 - 110 | 5 | 17 | |
| <i>Surrogate:</i> | | | | | | | | | | |
| <i>2-Fluorophenol</i> | | | | | <i>54</i> | <i>57</i> | <i>19 - 103</i> | | | |
| <i>Phenol-d6</i> | | | | | <i>60</i> | <i>63</i> | <i>30 - 103</i> | | | |
| <i>Nitrobenzene-d5</i> | | | | | <i>58</i> | <i>59</i> | <i>27 - 105</i> | | | |
| <i>2-Fluorobiphenyl</i> | | | | | <i>65</i> | <i>69</i> | <i>36 - 102</i> | | | |
| <i>2,4,6-Tribromophenol</i> | | | | | <i>83</i> | <i>89</i> | <i>33 - 110</i> | | | |
| <i>Terphenyl-d14</i> | | | | | <i>87</i> | <i>93</i> | <i>38 - 108</i> | | | |



Date of Report: October 10, 2018
 Samples Submitted: August 23, 2018
 Laboratory Reference: 1808-260
 Project: 14-05806-000

**TOTAL SOLIDS
 SM 2540G**

Matrix: Sediment
 Units: % Solids

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|-------------------|---------------------|------|----------|---------------|---------------|-------|
| Client ID: | CTRY-2M-2018 | | | | | |
| Laboratory ID: | 08-260-01 | | | | | |
| Total Solids | 39 | 0.50 | SM 2540G | 10-5-18 | 10-8-18 | |

| | | | | | | |
|-------------------|---------------------|------|----------|---------|---------|--|
| Client ID: | CTRY-2R-2018 | | | | | |
| Laboratory ID: | 08-260-02 | | | | | |
| Total Solids | 47 | 0.50 | SM 2540G | 8-30-18 | 8-31-18 | |

| | | | | | | |
|-------------------|---------------------|------|----------|---------|---------|--|
| Client ID: | CTRY-1M-2018 | | | | | |
| Laboratory ID: | 08-260-03 | | | | | |
| Total Solids | 28 | 0.50 | SM 2540G | 10-5-18 | 10-8-18 | |

| | | | | | | |
|-------------------|---------------------|------|----------|---------|---------|--|
| Client ID: | CTRY-1R-2018 | | | | | |
| Laboratory ID: | 08-260-04 | | | | | |
| Total Solids | 28 | 0.50 | SM 2540G | 8-30-18 | 8-31-18 | |

| | | | | | | |
|-------------------|---------------------|------|----------|---------|---------|--|
| Client ID: | SIDL-2M-2018 | | | | | |
| Laboratory ID: | 08-260-05 | | | | | |
| Total Solids | 32 | 0.50 | SM 2540G | 10-5-18 | 10-8-18 | |

| | | | | | | |
|-------------------|---------------------|------|----------|---------|---------|--|
| Client ID: | SIDL-2R-2018 | | | | | |
| Laboratory ID: | 08-260-06 | | | | | |
| Total Solids | 31 | 0.50 | SM 2540G | 8-30-18 | 8-31-18 | |



Date of Report: October 10, 2018
 Samples Submitted: August 23, 2018
 Laboratory Reference: 1808-260
 Project: 14-05806-000

**TOTAL SOLIDS
 SM 2540G
 QUALITY CONTROL**

Matrix: Sediment
 Units: % Solids

| Analyte | Result | | Spike Level | Source Result | Percent Recovery | Recovery Limits | RPD | RPD Limit | Flags |
|------------------|---------------|-------------|--------------------|----------------------|-------------------------|------------------------|------------|------------------|--------------|
| DUPLICATE | | | | | | | | | |
| Laboratory ID: | 08-260-02 | | | | | | | | |
| | ORIG | DUP | | | | | | | |
| Total Solids | 46.5 | 49.6 | NA | NA | NA | NA | 6 | 20 | |
| Laboratory ID: | 08-260-05 | | | | | | | | |
| | ORIG | DUP | | | | | | | |
| Total Solids | 31.6 | 44.3 | NA | NA | NA | NA | 33 | 20 | |





Data Qualifiers and Abbreviations

- A - Due to a high sample concentration, the amount spiked is insufficient for meaningful MS/MSD recovery data.
 - B - The analyte indicated was also found in the blank sample.
 - C - The duplicate RPD is outside control limits due to high result variability when analyte concentrations are within five times the quantitation limit.
 - E - The value reported exceeds the quantitation range and is an estimate.
 - F - Surrogate recovery data is not available due to the high concentration of coeluting target compounds.
 - H - The analyte indicated is a common laboratory solvent and may have been introduced during sample preparation, and be impacting the sample result.
 - I - Compound recovery is outside of the control limits.
 - J - The value reported was below the practical quantitation limit. The value is an estimate.
 - K - Sample duplicate RPD is outside control limits due to sample inhomogeneity. The sample was re-extracted and re-analyzed with similar results.
 - L - The RPD is outside of the control limits.
 - M - Hydrocarbons in the gasoline range are impacting the diesel range result.
 - M1 - Hydrocarbons in the gasoline range (toluene-naphthalene) are present in the sample.
 - N - Hydrocarbons in the lube oil range are impacting the diesel range result.
 - N1 - Hydrocarbons in diesel range are impacting lube oil range results.
 - O - Hydrocarbons indicative of heavier fuels are present in the sample and are impacting the gasoline result.
 - P - The RPD of the detected concentrations between the two columns is greater than 40.
 - Q - Surrogate recovery is outside of the control limits.
 - S - Surrogate recovery data is not available due to the necessary dilution of the sample.
 - T - The sample chromatogram is not similar to a typical _____.
 - U - The analyte was analyzed for, but was not detected above the reported sample quantitation limit.
 - U1 - The practical quantitation limit is elevated due to interferences present in the sample.
 - V - Matrix Spike/Matrix Spike Duplicate recoveries are outside control limits due to matrix effects.
 - W - Matrix Spike/Matrix Spike Duplicate RPD are outside control limits due to matrix effects.
 - X - Sample extract treated with a mercury cleanup procedure.
 - X1 - Sample extract treated with a Sulfuric acid/Silica gel cleanup procedure.
 - Y - The calibration verification for this analyte exceeded the 20% drift specified in method 8260C, and therefore the reported result should be considered an estimate. The overall performance of the calibration verification standard met the acceptance criteria of the method.
 - Z -
- ND - Not Detected at PQL
 PQL - Practical Quantitation Limit
 RPD - Relative Percent Difference





14648 NE 95th Street, Redmond, WA 98052
Telephone: 425.883.3881

Company: Herrera Environmental Consultants
Project No.: 14-05806-000
Project Name: Redmond Paired Watershed Study
Project Manager: John Lenth

CHAIN OF CUSTODY

Turnaround Requested:

- 1 Day
- 2 Day
- 3 Day
- Standard

Laboratory No.

08-260

Requested Analyses

| | | | | | | | | | | | | | | | | | | |
|----------------------|--------|------|----------------------------------|------------|--|--|--|--|--|--|--|--|--|--|--|--|--|--------------|
| Total Organic Carbon | Copper | Zinc | Polycyclic aromatic hydrocarbons | Phthalates | | | | | | | | | | | | | | Total Solids |
|----------------------|--------|------|----------------------------------|------------|--|--|--|--|--|--|--|--|--|--|--|--|--|--------------|

| Lab ID | Sample Identification | Date Sampled | Time Sampled | Matrix | # of Cont. | Requested Analyses | | | | | | | | | | | | | |
|--------|-----------------------|--------------|--------------|----------|------------|--------------------|---|---|---|---|--|--|--|--|--|--|--|--|---|
| 1 | CTRY-2M-2018 | 8.9.18 | 1230 | Sediment | 1 | | X | X | | | | | | | | | | | X |
| 2 | CTRY-2R-2018 | 8.9.18 | 1230 | Sediment | 1 | X | | | X | X | | | | | | | | | X |
| 3 | CTRY-1M-2018 | 8.22.18 | 1230 | Sediment | 1 | | X | X | | | | | | | | | | | X |
| 4 | CTRY-1R-2018 | 8.22.18 | 1230 | Sediment | 1 | X | | | X | X | | | | | | | | | X |
| 5 | SIDL-2M-2018 | 8.23.18 | 1135 | Sediment | 1 | | X | X | | | | | | | | | | | X |
| 6 | SIDL-2R-2018 | 8.23.18 | 1135 | Sediment | 1 | X | | | X | X | | | | | | | | | X |
| | | | | Sediment | 1 | | | | | | | | | | | | | | |
| | | | | Sediment | 1 | | | | | | | | | | | | | | |
| | | | | Sediment | 1 | | | | | | | | | | | | | | |
| | | | | Sediment | 1 | | | | | | | | | | | | | | |
| | | | | Sediment | 1 | | | | | | | | | | | | | | |
| | | | | Sediment | 1 | | | | | | | | | | | | | | |
| | | | | Sediment | 1 | | | | | | | | | | | | | | |
| | | | | Sediment | 1 | | | | | | | | | | | | | | |
| | | | | Sediment | 1 | | | | | | | | | | | | | | |

Relinquished by Miamu Date 8.23.18 Received by [Signature] Date 8/23/18
 Firm Herrera Time 1600 Firm OSE Time 1600
 Relinquished by _____ Date _____ Received by _____ Date _____
 Firm _____ Time _____ Firm _____ Time _____

Comments:



Data Quality Assurance Worksheet

Project Name/No./Client: Redmond Paired Watershed Study / 14-05806-000 / City of Redmond
 Laboratory/Parameters: OnSite Environmental : TOC, Cu, Zn, PAHs, phthalates
 Sample Date/Sample ID: 8/09 - 23/2018 / CTRY-2, CTRY-1, SIDL-2

By G. Catarra
 Date 10/17/2018 Page 1 of 1
 Checked: initials JL
 date 10/18/2018

| Parameter | Completeness/ Methodology | Pre-extraction Holding Times (minutes) | | Total Holding Times (days) | | Method Blanks Reporting Limit | Matrix Spikes/ Surrogate Recovery (%) | | Lab Control Samples Recovery (%) | | Lab Duplicates RPD (%) | | Field Duplicates RPD (%) | | Instrument Calibration/ Performance | ACTION |
|------------|------------------------------|--|------|-------------------------------|------|--|---|--------------------|--|------------|---------------------------|-------------------|-----------------------------|-------------------|---|--|
| | | Reported | Goal | Reported | Goal | | Reported | Goal | Reported | Goal | Reported | Goal ¹ | Reported | Goal ¹ | | |
| TOC | OK / EPA 9060A | NA | NA | 12-27 | ≤14 | ≤0.05% 0.05 % | NA | NA | 100 | ±20 | 6 | ≤20 | NS | ≤35 | OK | NONE. EPA HOLDING TIME 28 DAYS |
| Copper | OK / EPA 6020 | NA | NA | 42-56 | ≤180 | ≤1.0 MG/KG 1.0 MG/KG | 102,102 | ±25 | NR | ±15 | 2 | ≤20 | NS | ≤35 | OK | NONE |
| Zinc | OK / EPA 6020 | NA | NA | 42-56 | ≤180 | ≤2.5 mg/kg 2.5 MG/KG | 99,98 | ±25 | NR | ±15 | 0 | ≤20 | NS | ≤35 | OK | NONE |
| PAHs | OK / EPA 8270D/SIM | 13-27 | ≤14 | 1 | ≤40 | ≤20 ug/kg 16-20 UG/KG | NR | NA / 21- 120 | 57-99 | 25- 141 | BS/BSD 1-6 | ≤40 | NS | ≤50 | OK | CTRY-2 EXTRACTED OUTSIDE OF HT. FLAG RESULTS J OR UJ |
| Phthalates | OK / EPA 8270D | 13-27 | ≤14 | 1 | ≤40 | ≤0.1 MG/KG 2-2.5 MG/KG | NR | NA / 21- 120 | 57-99 | 25- 141 | BS/BSD 1-6 | ≤40 | NS | ≤50 | OK | CTRY-2 EXTRACTED OUTSIDE OF HT. FLAG RESULTS J OR UJ |

¹ If the sample or duplicate value is less than five times the reporting limit, the difference is calculated rather than the relative percent difference (RPD). The QA goal is a difference <2 times the detection limit instead of the number indicated in the goal column.

NA – not applicable or not available; NC – not calculable due to one or more values below the detection limit; NS – field duplicate not sampled.



14648 NE 95th Street, Redmond, WA 98052 • (425) 883-3881

October 10, 2018

John Lenth
Herrera Environmental Consultants, Inc.
2200 6th Avenue, Suite 1100
Seattle, WA 98121

Re: Analytical Data for Project 14-05806-000
Laboratory Reference No. 1809-115

Dear John:

Enclosed are the analytical results and associated quality control data for samples submitted on September 12, 2018.

The standard policy of OnSite Environmental, Inc. is to store your samples for 30 days from the date of receipt. If you require longer storage, please contact the laboratory.

We appreciate the opportunity to be of service to you on this project. If you have any questions concerning the data, or need additional information, please feel free to call me.

Sincerely,

A handwritten signature in black ink, appearing to read "Blair Goodrow", enclosed within a large, loopy circular flourish.

Blair Goodrow
Project Manager

Enclosures



OnSite Environmental, Inc. 14648 NE 95th Street, Redmond, WA 98052 (425) 883-3881

This report pertains to the samples analyzed in accordance with the chain of custody, and is intended only for the use of the individual or company to whom it is addressed.

Date of Report: October 10, 2018
Samples Submitted: September 12, 2018
Laboratory Reference: 1809-115
Project: 14-05806-000

Case Narrative

Samples were collected on September 6, 10, 11, and 12, 2018 and received by the laboratory on September 12, 2018. They were maintained at the laboratory at a temperature of 2°C to 6°C.

Please note that any and all Sediment sample results are reported on a dry-weight basis, unless otherwise noted below.

General QA/QC issues associated with the analytical data enclosed in this laboratory report will be indicated with a reference to a comment or explanation on the Data Qualifier page. More complex and involved QA/QC issues will be discussed in detail below.



Date of Report: October 10, 2018
 Samples Submitted: September 12, 2018
 Laboratory Reference: 1809-115
 Project: 14-05806-000

**TOTAL ORGANIC CARBON
 EPA 9060A**

Matrix: Sediment
 Units: % Carbon

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|----------------------|-----------------------|-------|-----------|---------------|---------------|-------|
| Client ID: | MONT-1R-2018 | | | | | |
| Laboratory ID: | 09-115-02 | | | | | |
| Total Organic Carbon | 3.7 | 0.13 | EPA 9060A | 9-19-18 | 9-19-18 | |
| Client ID: | MONT-2R-2018 | | | | | |
| Laboratory ID: | 09-115-04 | | | | | |
| Total Organic Carbon | 1.4 | 0.098 | EPA 9060A | 9-19-18 | 9-19-18 | |
| Client ID: | EVAMS-IR-2018 | | | | | |
| Laboratory ID: | 09-115-06 | | | | | |
| Total Organic Carbon | 4.8 | 0.13 | EPA 9060A | 9-19-18 | 9-19-18 | |
| Client ID: | EVALSS-1R-2018 | | | | | |
| Laboratory ID: | 09-115-08 | | | | | |
| Total Organic Carbon | 12 | 0.47 | EPA 9060A | 9-19-18 | 9-19-18 | |
| Client ID: | TOSH-4R-2018 | | | | | |
| Laboratory ID: | 09-115-10 | | | | | |
| Total Organic Carbon | 3.4 | 0.12 | EPA 9060A | 9-19-18 | 9-19-18 | |
| Client ID: | TOSH-2R-2018 | | | | | |
| Laboratory ID: | 09-115-12 | | | | | |
| Total Organic Carbon | 3.6 | 0.13 | EPA 9060A | 9-19-18 | 9-19-18 | |
| Client ID: | SIDL-1R-2018 | | | | | |
| Laboratory ID: | 09-115-14 | | | | | |
| Total Organic Carbon | 2.1 | 0.16 | EPA 9060A | 9-19-18 | 9-19-18 | |



Date of Report: October 10, 2018
 Samples Submitted: September 12, 2018
 Laboratory Reference: 1809-115
 Project: 14-05806-000

**TOTAL ORGANIC CARBON
 EPA 9060A
 QUALITY CONTROL**

Matrix: Sediment
 Units: % Carbon

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|----------------------|-----------|-------|-----------|---------------|---------------|-------|
| METHOD BLANK | | | | | | |
| Laboratory ID: | MB0919S1 | | | | | |
| Total Organic Carbon | ND | 0.042 | EPA 9060A | 9-19-18 | 9-19-18 | |

| Analyte | Result | Spike Level | Source Result | Percent Recovery | Recovery Limits | RPD | RPD Limit | Flags |
|----------------------|--------------|--------------|---------------|------------------|-----------------|-----|-----------|-------|
| DUPLICATE | | | | | | | | |
| Laboratory ID: | 09-157-01 | | | | | | | |
| | ORIG | DUP | | | | | | |
| Total Organic Carbon | 0.153 | 0.173 | NA | NA | NA | NA | 12 | 26 |

| | | | | | | | | |
|----------------------|-------------|------|----|-----|--------|----|----|--|
| SPIKE BLANK | | | | | | | | |
| Laboratory ID: | SB0919S1 | | | | | | | |
| | SB | SB | | SB | | | | |
| Total Organic Carbon | 44.4 | 42.1 | NA | 105 | 94-123 | NA | NA | |



Date of Report: October 10, 2018
 Samples Submitted: September 12, 2018
 Laboratory Reference: 1809-115
 Project: 14-05806-000

**TOTAL METALS
 EPA 6010D**

Matrix: Sediment
 Units: mg/Kg (ppm)

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|-------------------|---------------------|-----|-----------|---------------|---------------|-------|
| Client ID: | MONT-1M-2018 | | | | | |
| Laboratory ID: | 09-115-01 | | | | | |
| Copper | 32 | 3.0 | EPA 6010D | 10-3-18 | 10-4-18 | |
| Zinc | 260 | 7.5 | EPA 6010D | 10-3-18 | 10-4-18 | |

| | | | | | | |
|-------------------|---------------------|-----|-----------|---------|---------|--|
| Client ID: | MONT-2M-2018 | | | | | |
| Laboratory ID: | 09-115-03 | | | | | |
| Copper | 40 | 4.4 | EPA 6010D | 10-3-18 | 10-4-18 | |
| Zinc | 560 | 11 | EPA 6010D | 10-3-18 | 10-4-18 | |

| | | | | | | |
|-------------------|----------------------|-----|-----------|---------|---------|--|
| Client ID: | EVAMS-IM-2018 | | | | | |
| Laboratory ID: | 09-115-05 | | | | | |
| Copper | 22 | 6.9 | EPA 6010D | 10-3-18 | 10-4-18 | |
| Zinc | 91 | 17 | EPA 6010D | 10-3-18 | 10-4-18 | |

| | | | | | | |
|-------------------|-----------------------|-----|-----------|---------|---------|--|
| Client ID: | EVALSS-1M-2018 | | | | | |
| Laboratory ID: | 09-115-07 | | | | | |
| Copper | 38 | 5.3 | EPA 6010D | 10-3-18 | 10-4-18 | |
| Zinc | 100 | 13 | EPA 6010D | 10-3-18 | 10-4-18 | |

| | | | | | | |
|-------------------|---------------------|-----|-----------|---------|---------|--|
| Client ID: | TOSH-4M-2018 | | | | | |
| Laboratory ID: | 09-115-09 | | | | | |
| Copper | 54 | 2.8 | EPA 6010D | 10-3-18 | 10-4-18 | |
| Zinc | 920 | 7.1 | EPA 6010D | 10-3-18 | 10-4-18 | |

| | | | | | | |
|-------------------|---------------------|-----|-----------|---------|---------|--|
| Client ID: | TOSH-2M-2018 | | | | | |
| Laboratory ID: | 09-115-11 | | | | | |
| Copper | 33 | 2.2 | EPA 6010D | 10-3-18 | 10-4-18 | |
| Zinc | 340 | 5.6 | EPA 6010D | 10-3-18 | 10-4-18 | |

| | | | | | | |
|-------------------|---------------------|-----|-----------|---------|---------|--|
| Client ID: | SIDL-1M-2018 | | | | | |
| Laboratory ID: | 09-115-13 | | | | | |
| Copper | 32 | 6.5 | EPA 6010D | 10-3-18 | 10-4-18 | |
| Zinc | 98 | 16 | EPA 6010D | 10-3-18 | 10-4-18 | |



Date of Report: October 10, 2018
 Samples Submitted: September 12, 2018
 Laboratory Reference: 1809-115
 Project: 14-05806-000

**TOTAL METALS
 EPA 6010D
 QUALITY CONTROL**

Matrix: Sediment
 Units: mg/Kg (ppm)

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|---------------------|-----------|-----|-----------|---------------|---------------|-------|
| METHOD BLANK | | | | | | |
| Laboratory ID: | MB1003SM4 | | | | | |
| Copper | ND | 1.0 | EPA 6010D | 10-3-18 | 10-3-18 | |
| Zinc | ND | 2.5 | EPA 6010D | 10-3-18 | 10-3-18 | |

| Analyte | Result | Spike Level | Source Result | Percent Recovery | Recovery Limits | RPD | RPD Limit | Flags |
|------------------|-------------|-------------|---------------|------------------|-----------------|-----|-----------|-------|
| DUPLICATE | | | | | | | | |
| Laboratory ID: | 08-051-01 | | | | | | | |
| | ORIG | DUP | | | | | | |
| Copper | 8.90 | 8.75 | NA | NA | NA | NA | 2 | 20 |
| Zinc | 65.3 | 65.0 | NA | NA | NA | NA | 0 | 20 |

MATRIX SPIKES

| Laboratory ID: | MS | MSD | MS | MSD | MS | MSD | MS | MSD | RPD | RPD Limit | Flags |
|----------------|-------------|-------------|------|------|------|------------|------------|--------|-----|-----------|-------|
| Laboratory ID: | 08-051-01 | | | | | | | | | | |
| | MS | MSD | MS | MSD | MS | MSD | MS | MSD | | | |
| Copper | 60.1 | 59.9 | 50.0 | 50.0 | 8.90 | 102 | 102 | 75-125 | 0 | 20 | |
| Zinc | 164 | 163 | 100 | 100 | 65.3 | 99 | 98 | 75-125 | 1 | 20 | |



Date of Report: October 10, 2018
 Samples Submitted: September 12, 2018
 Laboratory Reference: 1809-115
 Project: 14-05806-000

SEMIVOLATILES EPA 8270D/SIM

Matrix: Sediment
 Units: mg/Kg

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|-----------------------------|-------------------------|-----------------------|---------------|---------------|---------------|-------|
| Client ID: | MONT-1R-2018 | | | | | |
| Laboratory ID: | 09-115-02 | | | | | |
| Naphthalene | ND | 0.0073 | EPA 8270D/SIM | 9-14-18 | 9-18-18 | |
| 2-Methylnaphthalene | ND | 0.0073 | EPA 8270D/SIM | 9-14-18 | 9-18-18 | |
| 1-Methylnaphthalene | ND | 0.0073 | EPA 8270D/SIM | 9-14-18 | 9-18-18 | |
| Dimethylphthalate | ND | 0.036 | EPA 8270D | 9-14-18 | 9-14-18 | |
| Acenaphthylene | ND | 0.0073 | EPA 8270D/SIM | 9-14-18 | 9-18-18 | |
| Acenaphthene | ND | 0.0073 | EPA 8270D/SIM | 9-14-18 | 9-18-18 | |
| Diethylphthalate | ND | 0.18 | EPA 8270D | 9-14-18 | 9-14-18 | |
| Fluorene | ND | 0.0073 | EPA 8270D/SIM | 9-14-18 | 9-18-18 | |
| Phenanthrene | ND | 0.0073 | EPA 8270D/SIM | 9-14-18 | 9-18-18 | |
| Anthracene | ND | 0.0073 | EPA 8270D/SIM | 9-14-18 | 9-18-18 | |
| Di-n-butylphthalate | 0.36 | 0.18 | EPA 8270D | 9-14-18 | 9-14-18 | |
| Fluoranthene | ND | 0.0073 | EPA 8270D/SIM | 9-14-18 | 9-18-18 | |
| Pyrene | ND | 0.0073 | EPA 8270D/SIM | 9-14-18 | 9-18-18 | |
| Butylbenzylphthalate | ND | 0.18 | EPA 8270D | 9-14-18 | 9-14-18 | |
| Benzo[a]anthracene | ND | 0.0073 | EPA 8270D/SIM | 9-14-18 | 9-18-18 | |
| Chrysene | ND | 0.0073 | EPA 8270D/SIM | 9-14-18 | 9-18-18 | |
| bis(2-Ethylhexyl)phthalate | ND | 0.18 | EPA 8270D | 9-14-18 | 9-14-18 | |
| Di-n-octylphthalate | ND | 0.18 | EPA 8270D | 9-14-18 | 9-14-18 | |
| Benzo[b]fluoranthene | ND | 0.0073 | EPA 8270D/SIM | 9-14-18 | 9-18-18 | |
| Benzo(j,k)fluoranthene | ND | 0.0073 | EPA 8270D/SIM | 9-14-18 | 9-18-18 | |
| Benzo[a]pyrene | ND | 0.0073 | EPA 8270D/SIM | 9-14-18 | 9-18-18 | |
| Indeno[1,2,3-cd]pyrene | ND | 0.0073 | EPA 8270D/SIM | 9-14-18 | 9-18-18 | |
| Dibenz[a,h]anthracene | ND | 0.0073 | EPA 8270D/SIM | 9-14-18 | 9-18-18 | |
| Benzo[g,h,i]perylene | ND | 0.0073 | EPA 8270D/SIM | 9-14-18 | 9-18-18 | |
| <i>Surrogate:</i> | <i>Percent Recovery</i> | <i>Control Limits</i> | | | | |
| <i>2-Fluorophenol</i> | <i>37</i> | <i>19 - 103</i> | | | | |
| <i>Phenol-d6</i> | <i>45</i> | <i>30 - 103</i> | | | | |
| <i>Nitrobenzene-d5</i> | <i>46</i> | <i>27 - 105</i> | | | | |
| <i>2-Fluorobiphenyl</i> | <i>50</i> | <i>36 - 102</i> | | | | |
| <i>2,4,6-Tribromophenol</i> | <i>50</i> | <i>33 - 110</i> | | | | |
| <i>Terphenyl-d14</i> | <i>54</i> | <i>38 - 108</i> | | | | |



Date of Report: October 10, 2018
 Samples Submitted: September 12, 2018
 Laboratory Reference: 1809-115
 Project: 14-05806-000

SEMIVOLATILES EPA 8270D/SIM

Matrix: Sediment
 Units: mg/Kg

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|-----------------------------|-------------------------|-----------------------|---------------|---------------|---------------|-------|
| Client ID: | MONT-2R-2018 | | | | | |
| Laboratory ID: | 09-115-04 | | | | | |
| Naphthalene | ND | 0.0057 | EPA 8270D/SIM | 9-14-18 | 9-18-18 | |
| 2-Methylnaphthalene | ND | 0.0057 | EPA 8270D/SIM | 9-14-18 | 9-18-18 | |
| 1-Methylnaphthalene | ND | 0.0057 | EPA 8270D/SIM | 9-14-18 | 9-18-18 | |
| Dimethylphthalate | ND | 0.028 | EPA 8270D | 9-14-18 | 9-14-18 | |
| Acenaphthylene | ND | 0.0057 | EPA 8270D/SIM | 9-14-18 | 9-18-18 | |
| Acenaphthene | ND | 0.0057 | EPA 8270D/SIM | 9-14-18 | 9-18-18 | |
| Diethylphthalate | ND | 0.14 | EPA 8270D | 9-14-18 | 9-14-18 | |
| Fluorene | ND | 0.0057 | EPA 8270D/SIM | 9-14-18 | 9-18-18 | |
| Phenanthrene | ND | 0.0057 | EPA 8270D/SIM | 9-14-18 | 9-18-18 | |
| Anthracene | ND | 0.0057 | EPA 8270D/SIM | 9-14-18 | 9-18-18 | |
| Di-n-butylphthalate | 0.17 | 0.14 | EPA 8270D | 9-14-18 | 9-14-18 | |
| Fluoranthene | ND | 0.0057 | EPA 8270D/SIM | 9-14-18 | 9-18-18 | |
| Pyrene | ND | 0.0057 | EPA 8270D/SIM | 9-14-18 | 9-18-18 | |
| Butylbenzylphthalate | ND | 0.14 | EPA 8270D | 9-14-18 | 9-14-18 | |
| Benzo[a]anthracene | ND | 0.0057 | EPA 8270D/SIM | 9-14-18 | 9-18-18 | |
| Chrysene | ND | 0.0057 | EPA 8270D/SIM | 9-14-18 | 9-18-18 | |
| bis(2-Ethylhexyl)phthalate | ND | 0.14 | EPA 8270D | 9-14-18 | 9-14-18 | |
| Di-n-octylphthalate | ND | 0.14 | EPA 8270D | 9-14-18 | 9-14-18 | |
| Benzo[b]fluoranthene | ND | 0.0057 | EPA 8270D/SIM | 9-14-18 | 9-18-18 | |
| Benzo(j,k)fluoranthene | ND | 0.0057 | EPA 8270D/SIM | 9-14-18 | 9-18-18 | |
| Benzo[a]pyrene | ND | 0.0057 | EPA 8270D/SIM | 9-14-18 | 9-18-18 | |
| Indeno[1,2,3-cd]pyrene | ND | 0.0057 | EPA 8270D/SIM | 9-14-18 | 9-18-18 | |
| Dibenz[a,h]anthracene | ND | 0.0057 | EPA 8270D/SIM | 9-14-18 | 9-18-18 | |
| Benzo[g,h,i]perylene | ND | 0.0057 | EPA 8270D/SIM | 9-14-18 | 9-18-18 | |
| <i>Surrogate:</i> | <i>Percent Recovery</i> | <i>Control Limits</i> | | | | |
| <i>2-Fluorophenol</i> | <i>25</i> | <i>19 - 103</i> | | | | |
| <i>Phenol-d6</i> | <i>34</i> | <i>30 - 103</i> | | | | |
| <i>Nitrobenzene-d5</i> | <i>30</i> | <i>27 - 105</i> | | | | |
| <i>2-Fluorobiphenyl</i> | <i>40</i> | <i>36 - 102</i> | | | | |
| <i>2,4,6-Tribromophenol</i> | <i>48</i> | <i>33 - 110</i> | | | | |
| <i>Terphenyl-d14</i> | <i>49</i> | <i>38 - 108</i> | | | | |



Date of Report: October 10, 2018
 Samples Submitted: September 12, 2018
 Laboratory Reference: 1809-115
 Project: 14-05806-000

SEMIVOLATILES EPA 8270D/SIM

Matrix: Sediment
 Units: mg/Kg

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|-----------------------------|-------------------------|-----------------------|---------------|---------------|---------------|-------|
| Client ID: | EVAMS-IR-2018 | | | | | |
| Laboratory ID: | 09-115-06 | | | | | |
| Naphthalene | ND | 0.0085 | EPA 8270D/SIM | 9-14-18 | 9-14-18 | |
| 2-Methylnaphthalene | ND | 0.0085 | EPA 8270D/SIM | 9-14-18 | 9-14-18 | |
| 1-Methylnaphthalene | ND | 0.0085 | EPA 8270D/SIM | 9-14-18 | 9-14-18 | |
| Dimethylphthalate | ND | 0.043 | EPA 8270D | 9-14-18 | 9-14-18 | |
| Acenaphthylene | ND | 0.0085 | EPA 8270D/SIM | 9-14-18 | 9-14-18 | |
| Acenaphthene | ND | 0.0085 | EPA 8270D/SIM | 9-14-18 | 9-14-18 | |
| Diethylphthalate | ND | 0.21 | EPA 8270D | 9-14-18 | 9-14-18 | |
| Fluorene | ND | 0.0085 | EPA 8270D/SIM | 9-14-18 | 9-14-18 | |
| Phenanthrene | ND | 0.0085 | EPA 8270D/SIM | 9-14-18 | 9-14-18 | |
| Anthracene | ND | 0.0085 | EPA 8270D/SIM | 9-14-18 | 9-14-18 | |
| Di-n-butylphthalate | 0.28 | 0.21 | EPA 8270D | 9-14-18 | 9-14-18 | |
| Fluoranthene | 0.032 | 0.0085 | EPA 8270D/SIM | 9-14-18 | 9-14-18 | |
| Pyrene | 0.048 | 0.043 | EPA 8270D | 9-14-18 | 9-14-18 | |
| Butylbenzylphthalate | ND | 0.21 | EPA 8270D | 9-14-18 | 9-14-18 | |
| Benzo[a]anthracene | 0.038 | 0.0085 | EPA 8270D/SIM | 9-14-18 | 9-14-18 | |
| Chrysene | 0.043 | 0.043 | EPA 8270D | 9-14-18 | 9-14-18 | |
| bis(2-Ethylhexyl)phthalate | 0.64 | 0.21 | EPA 8270D | 9-14-18 | 9-14-18 | |
| Di-n-octylphthalate | ND | 0.21 | EPA 8270D | 9-14-18 | 9-14-18 | |
| Benzo[b]fluoranthene | 0.053 | 0.0085 | EPA 8270D/SIM | 9-14-18 | 9-14-18 | |
| Benzo(j,k)fluoranthene | 0.019 | 0.0085 | EPA 8270D/SIM | 9-14-18 | 9-14-18 | |
| Benzo[a]pyrene | 0.042 | 0.0085 | EPA 8270D/SIM | 9-14-18 | 9-14-18 | |
| Indeno[1,2,3-cd]pyrene | 0.026 | 0.0085 | EPA 8270D/SIM | 9-14-18 | 9-14-18 | |
| Dibenz[a,h]anthracene | ND | 0.0085 | EPA 8270D/SIM | 9-14-18 | 9-14-18 | |
| Benzo[g,h,i]perylene | 0.020 | 0.0085 | EPA 8270D/SIM | 9-14-18 | 9-14-18 | |
| <i>Surrogate:</i> | <i>Percent Recovery</i> | <i>Control Limits</i> | | | | |
| <i>2-Fluorophenol</i> | <i>34</i> | <i>19 - 103</i> | | | | |
| <i>Phenol-d6</i> | <i>43</i> | <i>30 - 103</i> | | | | |
| <i>Nitrobenzene-d5</i> | <i>42</i> | <i>27 - 105</i> | | | | |
| <i>2-Fluorobiphenyl</i> | <i>46</i> | <i>36 - 102</i> | | | | |
| <i>2,4,6-Tribromophenol</i> | <i>48</i> | <i>33 - 110</i> | | | | |
| <i>Terphenyl-d14</i> | <i>48</i> | <i>38 - 108</i> | | | | |



Date of Report: October 10, 2018
 Samples Submitted: September 12, 2018
 Laboratory Reference: 1809-115
 Project: 14-05806-000

SEMIVOLATILES EPA 8270D/SIM

Matrix: Sediment
 Units: mg/Kg

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|-----------------------------|-------------------------|-----------------------|---------------|---------------|---------------|-------|
| Client ID: | EVALSS-1R-2018 | | | | | |
| Laboratory ID: | 09-115-08 | | | | | |
| Naphthalene | ND | 0.015 | EPA 8270D/SIM | 9-14-18 | 9-14-18 | |
| 2-Methylnaphthalene | ND | 0.015 | EPA 8270D/SIM | 9-14-18 | 9-14-18 | |
| 1-Methylnaphthalene | ND | 0.015 | EPA 8270D/SIM | 9-14-18 | 9-14-18 | |
| Dimethylphthalate | ND | 0.075 | EPA 8270D | 9-14-18 | 9-14-18 | |
| Acenaphthylene | ND | 0.015 | EPA 8270D/SIM | 9-14-18 | 9-14-18 | |
| Acenaphthene | ND | 0.015 | EPA 8270D/SIM | 9-14-18 | 9-14-18 | |
| Diethylphthalate | ND | 0.38 | EPA 8270D | 9-14-18 | 9-14-18 | |
| Fluorene | ND | 0.015 | EPA 8270D/SIM | 9-14-18 | 9-14-18 | |
| Phenanthrene | ND | 0.015 | EPA 8270D/SIM | 9-14-18 | 9-14-18 | |
| Anthracene | ND | 0.015 | EPA 8270D/SIM | 9-14-18 | 9-14-18 | |
| Di-n-butylphthalate | 0.49 | 0.38 | EPA 8270D | 9-14-18 | 9-14-18 | |
| Fluoranthene | 0.018 | 0.015 | EPA 8270D/SIM | 9-14-18 | 9-14-18 | |
| Pyrene | 0.018 | 0.015 | EPA 8270D/SIM | 9-14-18 | 9-14-18 | |
| Butylbenzylphthalate | ND | 0.38 | EPA 8270D | 9-14-18 | 9-14-18 | |
| Benzo[a]anthracene | ND | 0.015 | EPA 8270D/SIM | 9-14-18 | 9-14-18 | |
| Chrysene | ND | 0.015 | EPA 8270D/SIM | 9-14-18 | 9-14-18 | |
| bis(2-Ethylhexyl)phthalate | 2.1 | 0.38 | EPA 8270D | 9-14-18 | 9-14-18 | |
| Di-n-octylphthalate | ND | 0.38 | EPA 8270D | 9-14-18 | 9-14-18 | |
| Benzo[b]fluoranthene | ND | 0.015 | EPA 8270D/SIM | 9-14-18 | 9-14-18 | |
| Benzo(j,k)fluoranthene | ND | 0.015 | EPA 8270D/SIM | 9-14-18 | 9-14-18 | |
| Benzo[a]pyrene | ND | 0.015 | EPA 8270D/SIM | 9-14-18 | 9-14-18 | |
| Indeno[1,2,3-cd]pyrene | ND | 0.015 | EPA 8270D/SIM | 9-14-18 | 9-14-18 | |
| Dibenz[a,h]anthracene | ND | 0.015 | EPA 8270D/SIM | 9-14-18 | 9-14-18 | |
| Benzo[g,h,i]perylene | ND | 0.015 | EPA 8270D/SIM | 9-14-18 | 9-14-18 | |
| <i>Surrogate:</i> | <i>Percent Recovery</i> | <i>Control Limits</i> | | | | |
| <i>2-Fluorophenol</i> | <i>34</i> | <i>19 - 103</i> | | | | |
| <i>Phenol-d6</i> | <i>46</i> | <i>30 - 103</i> | | | | |
| <i>Nitrobenzene-d5</i> | <i>44</i> | <i>27 - 105</i> | | | | |
| <i>2-Fluorobiphenyl</i> | <i>48</i> | <i>36 - 102</i> | | | | |
| <i>2,4,6-Tribromophenol</i> | <i>53</i> | <i>33 - 110</i> | | | | |
| <i>Terphenyl-d14</i> | <i>51</i> | <i>38 - 108</i> | | | | |



Date of Report: October 10, 2018
 Samples Submitted: September 12, 2018
 Laboratory Reference: 1809-115
 Project: 14-05806-000

SEMIVOLATILES EPA 8270D/SIM

Matrix: Sediment
 Units: mg/Kg

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|-----------------------------|-------------------------|-----------------------|---------------|---------------|---------------|-------|
| Client ID: | TOSH-4R-2018 | | | | | |
| Laboratory ID: | 09-115-10 | | | | | |
| Naphthalene | ND | 0.0076 | EPA 8270D/SIM | 9-14-18 | 9-14-18 | |
| 2-Methylnaphthalene | ND | 0.0076 | EPA 8270D/SIM | 9-14-18 | 9-14-18 | |
| 1-Methylnaphthalene | ND | 0.0076 | EPA 8270D/SIM | 9-14-18 | 9-14-18 | |
| Dimethylphthalate | ND | 0.038 | EPA 8270D | 9-14-18 | 9-14-18 | |
| Acenaphthylene | ND | 0.0076 | EPA 8270D/SIM | 9-14-18 | 9-14-18 | |
| Acenaphthene | ND | 0.0076 | EPA 8270D/SIM | 9-14-18 | 9-14-18 | |
| Diethylphthalate | ND | 0.19 | EPA 8270D | 9-14-18 | 9-14-18 | |
| Fluorene | ND | 0.0076 | EPA 8270D/SIM | 9-14-18 | 9-14-18 | |
| Phenanthrene | ND | 0.0076 | EPA 8270D/SIM | 9-14-18 | 9-14-18 | |
| Anthracene | ND | 0.0076 | EPA 8270D/SIM | 9-14-18 | 9-14-18 | |
| Di-n-butylphthalate | 0.32 | 0.19 | EPA 8270D | 9-14-18 | 9-14-18 | |
| Fluoranthene | 0.0091 | 0.0076 | EPA 8270D/SIM | 9-14-18 | 9-14-18 | |
| Pyrene | 0.010 | 0.0076 | EPA 8270D/SIM | 9-14-18 | 9-14-18 | |
| Butylbenzylphthalate | ND | 0.19 | EPA 8270D | 9-14-18 | 9-14-18 | |
| Benzo[a]anthracene | ND | 0.0076 | EPA 8270D/SIM | 9-14-18 | 9-14-18 | |
| Chrysene | 0.0087 | 0.0076 | EPA 8270D/SIM | 9-14-18 | 9-14-18 | |
| bis(2-Ethylhexyl)phthalate | 1.7 | 0.19 | EPA 8270D | 9-14-18 | 9-14-18 | |
| Di-n-octylphthalate | ND | 0.19 | EPA 8270D | 9-14-18 | 9-14-18 | |
| Benzo[b]fluoranthene | 0.0087 | 0.0076 | EPA 8270D/SIM | 9-14-18 | 9-14-18 | |
| Benzo(j,k)fluoranthene | ND | 0.0076 | EPA 8270D/SIM | 9-14-18 | 9-14-18 | |
| Benzo[a]pyrene | ND | 0.0076 | EPA 8270D/SIM | 9-14-18 | 9-14-18 | |
| Indeno[1,2,3-cd]pyrene | ND | 0.0076 | EPA 8270D/SIM | 9-14-18 | 9-14-18 | |
| Dibenz[a,h]anthracene | ND | 0.0076 | EPA 8270D/SIM | 9-14-18 | 9-14-18 | |
| Benzo[g,h,i]perylene | 0.011 | 0.0076 | EPA 8270D/SIM | 9-14-18 | 9-14-18 | |
| <i>Surrogate:</i> | <i>Percent Recovery</i> | <i>Control Limits</i> | | | | |
| <i>2-Fluorophenol</i> | <i>33</i> | <i>19 - 103</i> | | | | |
| <i>Phenol-d6</i> | <i>43</i> | <i>30 - 103</i> | | | | |
| <i>Nitrobenzene-d5</i> | <i>41</i> | <i>27 - 105</i> | | | | |
| <i>2-Fluorobiphenyl</i> | <i>46</i> | <i>36 - 102</i> | | | | |
| <i>2,4,6-Tribromophenol</i> | <i>48</i> | <i>33 - 110</i> | | | | |
| <i>Terphenyl-d14</i> | <i>49</i> | <i>38 - 108</i> | | | | |



Date of Report: October 10, 2018
 Samples Submitted: September 12, 2018
 Laboratory Reference: 1809-115
 Project: 14-05806-000

SEMIVOLATILES EPA 8270D/SIM

Matrix: Sediment
 Units: mg/Kg

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|-----------------------------|-------------------------|-----------------------|---------------|---------------|---------------|-------|
| Client ID: | TOSH-2R-2018 | | | | | |
| Laboratory ID: | 09-115-12 | | | | | |
| Naphthalene | ND | 0.0084 | EPA 8270D/SIM | 9-14-18 | 9-18-18 | |
| 2-Methylnaphthalene | ND | 0.0084 | EPA 8270D/SIM | 9-14-18 | 9-18-18 | |
| 1-Methylnaphthalene | ND | 0.0084 | EPA 8270D/SIM | 9-14-18 | 9-18-18 | |
| Dimethylphthalate | ND | 0.042 | EPA 8270D | 9-14-18 | 9-14-18 | |
| Acenaphthylene | ND | 0.0084 | EPA 8270D/SIM | 9-14-18 | 9-18-18 | |
| Acenaphthene | ND | 0.0084 | EPA 8270D/SIM | 9-14-18 | 9-18-18 | |
| Diethylphthalate | ND | 0.21 | EPA 8270D | 9-14-18 | 9-14-18 | |
| Fluorene | ND | 0.0084 | EPA 8270D/SIM | 9-14-18 | 9-18-18 | |
| Phenanthrene | 0.046 | 0.042 | EPA 8270D | 9-14-18 | 9-14-18 | |
| Anthracene | ND | 0.0084 | EPA 8270D/SIM | 9-14-18 | 9-18-18 | |
| Di-n-butylphthalate | 0.38 | 0.21 | EPA 8270D | 9-14-18 | 9-14-18 | |
| Fluoranthene | 0.068 | 0.042 | EPA 8270D | 9-14-18 | 9-14-18 | |
| Pyrene | 0.071 | 0.042 | EPA 8270D | 9-14-18 | 9-14-18 | |
| Butylbenzylphthalate | ND | 0.21 | EPA 8270D | 9-14-18 | 9-14-18 | |
| Benzo[a]anthracene | 0.037 | 0.0084 | EPA 8270D/SIM | 9-14-18 | 9-18-18 | |
| Chrysene | 0.045 | 0.0084 | EPA 8270D/SIM | 9-14-18 | 9-18-18 | |
| bis(2-Ethylhexyl)phthalate | 0.95 | 0.21 | EPA 8270D | 9-14-18 | 9-14-18 | |
| Di-n-octylphthalate | ND | 0.21 | EPA 8270D | 9-14-18 | 9-14-18 | |
| Benzo[b]fluoranthene | 0.060 | 0.0084 | EPA 8270D/SIM | 9-14-18 | 9-18-18 | |
| Benzo(j,k)fluoranthene | 0.018 | 0.0084 | EPA 8270D/SIM | 9-14-18 | 9-18-18 | |
| Benzo[a]pyrene | 0.040 | 0.0084 | EPA 8270D/SIM | 9-14-18 | 9-18-18 | |
| Indeno[1,2,3-cd]pyrene | 0.033 | 0.0084 | EPA 8270D/SIM | 9-14-18 | 9-18-18 | |
| Dibenz[a,h]anthracene | ND | 0.0084 | EPA 8270D/SIM | 9-14-18 | 9-18-18 | |
| Benzo[g,h,i]perylene | 0.031 | 0.0084 | EPA 8270D/SIM | 9-14-18 | 9-18-18 | |
| <i>Surrogate:</i> | <i>Percent Recovery</i> | <i>Control Limits</i> | | | | |
| <i>2-Fluorophenol</i> | <i>33</i> | <i>19 - 103</i> | | | | |
| <i>Phenol-d6</i> | <i>46</i> | <i>30 - 103</i> | | | | |
| <i>Nitrobenzene-d5</i> | <i>43</i> | <i>27 - 105</i> | | | | |
| <i>2-Fluorobiphenyl</i> | <i>48</i> | <i>36 - 102</i> | | | | |
| <i>2,4,6-Tribromophenol</i> | <i>48</i> | <i>33 - 110</i> | | | | |
| <i>Terphenyl-d14</i> | <i>50</i> | <i>38 - 108</i> | | | | |



Date of Report: October 10, 2018
 Samples Submitted: September 12, 2018
 Laboratory Reference: 1809-115
 Project: 14-05806-000

SEMIVOLATILES EPA 8270D/SIM

Matrix: Sediment
 Units: mg/Kg

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|-----------------------------|-------------------------|-----------------------|---------------|---------------|---------------|-------|
| Client ID: | SIDL-1R-2018 | | | | | |
| Laboratory ID: | 09-115-14 | | | | | |
| Naphthalene | ND | 0.0082 | EPA 8270D/SIM | 9-14-18 | 9-18-18 | |
| 2-Methylnaphthalene | ND | 0.0082 | EPA 8270D/SIM | 9-14-18 | 9-18-18 | |
| 1-Methylnaphthalene | ND | 0.0082 | EPA 8270D/SIM | 9-14-18 | 9-18-18 | |
| Dimethylphthalate | ND | 0.041 | EPA 8270D | 9-14-18 | 9-14-18 | |
| Acenaphthylene | ND | 0.0082 | EPA 8270D/SIM | 9-14-18 | 9-18-18 | |
| Acenaphthene | ND | 0.0082 | EPA 8270D/SIM | 9-14-18 | 9-18-18 | |
| Diethylphthalate | ND | 0.21 | EPA 8270D | 9-14-18 | 9-14-18 | |
| Fluorene | ND | 0.0082 | EPA 8270D/SIM | 9-14-18 | 9-18-18 | |
| Phenanthrene | 0.0090 | 0.0082 | EPA 8270D/SIM | 9-14-18 | 9-18-18 | |
| Anthracene | ND | 0.0082 | EPA 8270D/SIM | 9-14-18 | 9-18-18 | |
| Di-n-butylphthalate | 0.31 | 0.21 | EPA 8270D | 9-14-18 | 9-14-18 | |
| Fluoranthene | 0.017 | 0.0082 | EPA 8270D/SIM | 9-14-18 | 9-18-18 | |
| Pyrene | 0.024 | 0.0082 | EPA 8270D/SIM | 9-14-18 | 9-18-18 | |
| Butylbenzylphthalate | ND | 0.21 | EPA 8270D | 9-14-18 | 9-14-18 | |
| Benzo[a]anthracene | 0.014 | 0.0082 | EPA 8270D/SIM | 9-14-18 | 9-18-18 | |
| Chrysene | 0.016 | 0.0082 | EPA 8270D/SIM | 9-14-18 | 9-18-18 | |
| bis(2-Ethylhexyl)phthalate | ND | 0.21 | EPA 8270D | 9-14-18 | 9-14-18 | |
| Di-n-octylphthalate | ND | 0.21 | EPA 8270D | 9-14-18 | 9-14-18 | |
| Benzo[b]fluoranthene | 0.015 | 0.0082 | EPA 8270D/SIM | 9-14-18 | 9-18-18 | |
| Benzo(j,k)fluoranthene | ND | 0.0082 | EPA 8270D/SIM | 9-14-18 | 9-18-18 | |
| Benzo[a]pyrene | 0.016 | 0.0082 | EPA 8270D/SIM | 9-14-18 | 9-18-18 | |
| Indeno[1,2,3-cd]pyrene | 0.0091 | 0.0082 | EPA 8270D/SIM | 9-14-18 | 9-18-18 | |
| Dibenz[a,h]anthracene | ND | 0.0082 | EPA 8270D/SIM | 9-14-18 | 9-18-18 | |
| Benzo[g,h,i]perylene | ND | 0.0082 | EPA 8270D/SIM | 9-14-18 | 9-18-18 | |
| <i>Surrogate:</i> | <i>Percent Recovery</i> | <i>Control Limits</i> | | | | |
| <i>2-Fluorophenol</i> | <i>28</i> | <i>19 - 103</i> | | | | |
| <i>Phenol-d6</i> | <i>40</i> | <i>30 - 103</i> | | | | |
| <i>Nitrobenzene-d5</i> | <i>33</i> | <i>27 - 105</i> | | | | |
| <i>2-Fluorobiphenyl</i> | <i>39</i> | <i>36 - 102</i> | | | | |
| <i>2,4,6-Tribromophenol</i> | <i>49</i> | <i>33 - 110</i> | | | | |
| <i>Terphenyl-d14</i> | <i>46</i> | <i>38 - 108</i> | | | | |



Date of Report: October 10, 2018
 Samples Submitted: September 12, 2018
 Laboratory Reference: 1809-115
 Project: 14-05806-000

**SEMIVOLATILES EPA 8270D/SIM
 METHOD BLANK QUALITY CONTROL**

Matrix: Sediment
 Units: mg/Kg

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|-----------------------------|-------------------------|-----------------------|---------------|---------------|---------------|-------|
| Laboratory ID: | MB0914S1 | | | | | |
| Naphthalene | ND | 0.0040 | EPA 8270D/SIM | 9-14-18 | 9-14-18 | |
| 2-Methylnaphthalene | ND | 0.0040 | EPA 8270D/SIM | 9-14-18 | 9-14-18 | |
| 1-Methylnaphthalene | ND | 0.0040 | EPA 8270D/SIM | 9-14-18 | 9-14-18 | |
| Dimethylphthalate | ND | 0.020 | EPA 8270D | 9-14-18 | 9-14-18 | |
| Acenaphthylene | ND | 0.0040 | EPA 8270D/SIM | 9-14-18 | 9-14-18 | |
| Acenaphthene | ND | 0.0040 | EPA 8270D/SIM | 9-14-18 | 9-14-18 | |
| Diethylphthalate | ND | 0.10 | EPA 8270D | 9-14-18 | 9-14-18 | |
| Fluorene | ND | 0.0040 | EPA 8270D/SIM | 9-14-18 | 9-14-18 | |
| Phenanthrene | ND | 0.0040 | EPA 8270D/SIM | 9-14-18 | 9-14-18 | |
| Anthracene | ND | 0.0040 | EPA 8270D/SIM | 9-14-18 | 9-14-18 | |
| Di-n-butylphthalate | ND | 0.10 | EPA 8270D | 9-14-18 | 9-14-18 | |
| Fluoranthene | ND | 0.0040 | EPA 8270D/SIM | 9-14-18 | 9-14-18 | |
| Pyrene | ND | 0.0040 | EPA 8270D/SIM | 9-14-18 | 9-14-18 | |
| Butylbenzylphthalate | ND | 0.10 | EPA 8270D | 9-14-18 | 9-14-18 | |
| Benzo[a]anthracene | ND | 0.0040 | EPA 8270D/SIM | 9-14-18 | 9-14-18 | |
| Chrysene | ND | 0.0040 | EPA 8270D/SIM | 9-14-18 | 9-14-18 | |
| bis(2-Ethylhexyl)phthalate | ND | 0.10 | EPA 8270D | 9-14-18 | 9-14-18 | |
| Di-n-octylphthalate | ND | 0.10 | EPA 8270D | 9-14-18 | 9-14-18 | |
| Benzo[b]fluoranthene | ND | 0.0040 | EPA 8270D/SIM | 9-14-18 | 9-14-18 | |
| Benzo[j,k]fluoranthene | ND | 0.0040 | EPA 8270D/SIM | 9-14-18 | 9-14-18 | |
| Benzo[a]pyrene | ND | 0.0040 | EPA 8270D/SIM | 9-14-18 | 9-14-18 | |
| Indeno[1,2,3-cd]pyrene | ND | 0.0040 | EPA 8270D/SIM | 9-14-18 | 9-14-18 | |
| Dibenz[a,h]anthracene | ND | 0.0040 | EPA 8270D/SIM | 9-14-18 | 9-14-18 | |
| Benzo[g,h,i]perylene | ND | 0.0040 | EPA 8270D/SIM | 9-14-18 | 9-14-18 | |
| <i>Surrogate:</i> | <i>Percent Recovery</i> | <i>Control Limits</i> | | | | |
| <i>2-Fluorophenol</i> | <i>67</i> | <i>19 - 103</i> | | | | |
| <i>Phenol-d6</i> | <i>75</i> | <i>30 - 103</i> | | | | |
| <i>Nitrobenzene-d5</i> | <i>78</i> | <i>27 - 105</i> | | | | |
| <i>2-Fluorobiphenyl</i> | <i>75</i> | <i>36 - 102</i> | | | | |
| <i>2,4,6-Tribromophenol</i> | <i>66</i> | <i>33 - 110</i> | | | | |
| <i>Terphenyl-d14</i> | <i>69</i> | <i>38 - 108</i> | | | | |



Date of Report: October 10, 2018
 Samples Submitted: September 12, 2018
 Laboratory Reference: 1809-115
 Project: 14-05806-000

**SEMIVOLATILES EPA 8270D/SIM
 SB/SBD QUALITY CONTROL**

Matrix: Sediment
 Units: mg/Kg

| Analyte | Result | | Spike Level | | Percent Recovery | | Recovery | RPD | RPD | Flags |
|-----------------------------|--------------|--------------|-------------|-------|------------------|-----------|-----------------|-----|-----|-------|
| | | | | | Recovery | Limits | Limit | | | |
| SPIKE BLANKS | | | | | | | | | | |
| Laboratory ID: | SB0914S1 | | | | | | | | | |
| | SB | SBD | SB | SBD | SB | SBD | | | | |
| Phenol | 0.591 | 0.608 | 0.800 | 0.800 | 74 | 76 | 45 - 94 | 3 | 29 | |
| 2-Chlorophenol | 0.601 | 0.634 | 0.800 | 0.800 | 75 | 79 | 46 - 94 | 5 | 33 | |
| 1,4-Dichlorobenzene | 0.292 | 0.300 | 0.400 | 0.400 | 73 | 75 | 42 - 91 | 3 | 37 | |
| n-Nitroso-di-n-propylamine | 0.341 | 0.355 | 0.400 | 0.400 | 85 | 89 | 45 - 100 | 4 | 26 | |
| 1,2,4-Trichlorobenzene | 0.280 | 0.298 | 0.400 | 0.400 | 70 | 75 | 45 - 100 | 6 | 32 | |
| 4-Chloro-3-methylphenol | 0.632 | 0.683 | 0.800 | 0.800 | 79 | 85 | 55 - 97 | 8 | 21 | |
| Acenaphthene | 0.304 | 0.325 | 0.400 | 0.400 | 76 | 81 | 48 - 91 | 7 | 21 | |
| 4-Nitrophenol | 0.698 | 0.768 | 0.800 | 0.800 | 87 | 96 | 53 - 102 | 10 | 20 | |
| 2,4-Dinitrotoluene | 0.305 | 0.313 | 0.400 | 0.400 | 76 | 78 | 47 - 96 | 3 | 19 | |
| Pentachlorophenol | 0.638 | 0.691 | 0.800 | 0.800 | 80 | 86 | 35 - 125 | 8 | 26 | |
| Pyrene | 0.294 | 0.311 | 0.400 | 0.400 | 74 | 78 | 55 - 110 | 6 | 17 | |
| <i>Surrogate:</i> | | | | | | | | | | |
| <i>2-Fluorophenol</i> | | | | | <i>65</i> | <i>65</i> | <i>19 - 103</i> | | | |
| <i>Phenol-d6</i> | | | | | <i>74</i> | <i>74</i> | <i>30 - 103</i> | | | |
| <i>Nitrobenzene-d5</i> | | | | | <i>75</i> | <i>76</i> | <i>27 - 105</i> | | | |
| <i>2-Fluorobiphenyl</i> | | | | | <i>70</i> | <i>73</i> | <i>36 - 102</i> | | | |
| <i>2,4,6-Tribromophenol</i> | | | | | <i>68</i> | <i>70</i> | <i>33 - 110</i> | | | |
| <i>Terphenyl-d14</i> | | | | | <i>65</i> | <i>68</i> | <i>38 - 108</i> | | | |



Date of Report: October 10, 2018
 Samples Submitted: September 12, 2018
 Laboratory Reference: 1809-115
 Project: 14-05806-000

**TOTAL SOLIDS
 SM 2540G**

Matrix: Sediment
 Units: % Solids

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|-------------------|---------------------|------|----------|---------------|---------------|-------|
| Client ID: | MONT-1M-2018 | | | | | |
| Laboratory ID: | 09-115-01 | | | | | |
| Total Solids | 33 | 0.50 | SM 2540G | 10-5-18 | 10-8-18 | |

| | | | | | | |
|-------------------|---------------------|------|----------|---------|---------|--|
| Client ID: | MONT-1R-2018 | | | | | |
| Laboratory ID: | 09-115-02 | | | | | |
| Total Solids | 55 | 0.50 | SM 2540G | 9-14-18 | 9-17-18 | |

| | | | | | | |
|-------------------|---------------------|------|----------|---------|---------|--|
| Client ID: | MONT-2M-2018 | | | | | |
| Laboratory ID: | 09-115-03 | | | | | |
| Total Solids | 23 | 0.50 | SM 2540G | 10-5-18 | 10-8-18 | |

| | | | | | | |
|-------------------|---------------------|------|----------|---------|---------|--|
| Client ID: | MONT-2R-2018 | | | | | |
| Laboratory ID: | 09-115-04 | | | | | |
| Total Solids | 70 | 0.50 | SM 2540G | 9-14-18 | 9-17-18 | |

| | | | | | | |
|-------------------|----------------------|------|----------|---------|---------|--|
| Client ID: | EVAMS-IM-2018 | | | | | |
| Laboratory ID: | 09-115-05 | | | | | |
| Total Solids | 15 | 0.50 | SM 2540G | 10-5-18 | 10-8-18 | |

| | | | | | | |
|-------------------|----------------------|------|----------|---------|---------|--|
| Client ID: | EVAMS-IR-2018 | | | | | |
| Laboratory ID: | 09-115-06 | | | | | |
| Total Solids | 47 | 0.50 | SM 2540G | 9-14-18 | 9-17-18 | |

| | | | | | | |
|-------------------|-----------------------|------|----------|---------|---------|--|
| Client ID: | EVALSS-1M-2018 | | | | | |
| Laboratory ID: | 09-115-07 | | | | | |
| Total Solids | 19 | 0.50 | SM 2540G | 10-5-18 | 10-8-18 | |



Date of Report: October 10, 2018
 Samples Submitted: September 12, 2018
 Laboratory Reference: 1809-115
 Project: 14-05806-000

**TOTAL SOLIDS
 SM 2540G**

Matrix: Sediment
 Units: % Solids

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|-------------------|-----------------------|------|----------|---------------|---------------|-------|
| Client ID: | EvalSS-1R-2018 | | | | | |
| Laboratory ID: | 09-115-08 | | | | | |
| Total Solids | 27 | 0.50 | SM 2540G | 9-14-18 | 9-17-18 | |

| | | | | | | |
|-------------------|---------------------|------|----------|---------|---------|--|
| Client ID: | TOSH-4M-2018 | | | | | |
| Laboratory ID: | 09-115-09 | | | | | |
| Total Solids | 35 | 0.50 | SM 2540G | 10-5-18 | 10-8-18 | |

| | | | | | | |
|-------------------|---------------------|------|----------|---------|---------|--|
| Client ID: | TOSH-4R-2018 | | | | | |
| Laboratory ID: | 09-115-10 | | | | | |
| Total Solids | 52 | 0.50 | SM 2540G | 9-14-18 | 9-17-18 | |

| | | | | | | |
|-------------------|---------------------|------|----------|---------|---------|--|
| Client ID: | TOSH-2M-2018 | | | | | |
| Laboratory ID: | 09-115-11 | | | | | |
| Total Solids | 45 | 0.50 | SM 2540G | 10-5-18 | 10-8-18 | |

| | | | | | | |
|-------------------|---------------------|------|----------|---------|---------|--|
| Client ID: | TOSH-2R-2018 | | | | | |
| Laboratory ID: | 09-115-12 | | | | | |
| Total Solids | 48 | 0.50 | SM 2540G | 9-14-18 | 9-17-18 | |

| | | | | | | |
|-------------------|---------------------|------|----------|---------|---------|--|
| Client ID: | SIDL-1M-2018 | | | | | |
| Laboratory ID: | 09-115-13 | | | | | |
| Total Solids | 15 | 0.50 | SM 2540G | 10-5-18 | 10-8-18 | |

| | | | | | | |
|-------------------|---------------------|------|----------|---------|---------|--|
| Client ID: | SIDL-1R-2018 | | | | | |
| Laboratory ID: | 09-115-14 | | | | | |
| Total Solids | 49 | 0.50 | SM 2540G | 9-14-18 | 9-17-18 | |



Date of Report: October 10, 2018
 Samples Submitted: September 12, 2018
 Laboratory Reference: 1809-115
 Project: 14-05806-000

**TOTAL SOLIDS
 SM 2540G
 QUALITY CONTROL**

Matrix: Sediment
 Units: % Solids

| Analyte | Result | | Spike Level | Source Result | Percent Recovery | Recovery Limits | RPD | RPD Limit | Flags |
|------------------|---------------|-------------|--------------------|----------------------|-------------------------|------------------------|------------|------------------|--------------|
| DUPLICATE | | | | | | | | | |
| Laboratory ID: | 09-115-14 DUP | | | | | | | | |
| | ORIG | DUP | | | | | | | |
| Total Solids | 48.6 | 46.1 | NA | NA | NA | NA | 5 | 20 | |
| Laboratory ID: | 09-115-09 | | | | | | | | |
| | ORIG | DUP | | | | | | | |
| Total Solids | 35.3 | 41.3 | NA | NA | NA | NA | 16 | 20 | |





Data Qualifiers and Abbreviations

- A - Due to a high sample concentration, the amount spiked is insufficient for meaningful MS/MSD recovery data.
 - B - The analyte indicated was also found in the blank sample.
 - C - The duplicate RPD is outside control limits due to high result variability when analyte concentrations are within five times the quantitation limit.
 - E - The value reported exceeds the quantitation range and is an estimate.
 - F - Surrogate recovery data is not available due to the high concentration of coeluting target compounds.
 - H - The analyte indicated is a common laboratory solvent and may have been introduced during sample preparation, and be impacting the sample result.
 - I - Compound recovery is outside of the control limits.
 - J - The value reported was below the practical quantitation limit. The value is an estimate.
 - K - Sample duplicate RPD is outside control limits due to sample inhomogeneity. The sample was re-extracted and re-analyzed with similar results.
 - L - The RPD is outside of the control limits.
 - M - Hydrocarbons in the gasoline range are impacting the diesel range result.
 - M1 - Hydrocarbons in the gasoline range (toluene-naphthalene) are present in the sample.
 - N - Hydrocarbons in the lube oil range are impacting the diesel range result.
 - N1 - Hydrocarbons in diesel range are impacting lube oil range results.
 - O - Hydrocarbons indicative of heavier fuels are present in the sample and are impacting the gasoline result.
 - P - The RPD of the detected concentrations between the two columns is greater than 40.
 - Q - Surrogate recovery is outside of the control limits.
 - S - Surrogate recovery data is not available due to the necessary dilution of the sample.
 - T - The sample chromatogram is not similar to a typical _____.
 - U - The analyte was analyzed for, but was not detected above the reported sample quantitation limit.
 - U1 - The practical quantitation limit is elevated due to interferences present in the sample.
 - V - Matrix Spike/Matrix Spike Duplicate recoveries are outside control limits due to matrix effects.
 - W - Matrix Spike/Matrix Spike Duplicate RPD are outside control limits due to matrix effects.
 - X - Sample extract treated with a mercury cleanup procedure.
 - X1 - Sample extract treated with a Sulfuric acid/Silica gel cleanup procedure.
 - Y - The calibration verification for this analyte exceeded the 20% drift specified in method 8260C, and therefore the reported result should be considered an estimate. The overall performance of the calibration verification standard met the acceptance criteria of the method.
 - Z -
- ND - Not Detected at PQL
 PQL - Practical Quantitation Limit
 RPD - Relative Percent Difference



Chain of Custody

Company: Herrera
 Project Number: 14-05206-000
 Project Name: RPWS
 Project Manager: John Lenth
 Sampled by: Bhanna Bland

Turnaround Request (in working days)
 (Check One)
 Same Day 1 Day
 2 Days 3 Days
 Standard (7 Days)
 _____ (other)

Laboratory Number: 09-115

| Lab ID | Sample Identification | Date Sampled | Time Sampled | Matrix | Number of Containers | NWTPH-HCID | NWTPH-Gx/BTEX | NWTPH-Gx | NWTPH-Dx (<input type="checkbox"/> Acid / SG Clean-up) | Volatiles 8260C | Halogenated Volatiles 8260C | EDB EPA 8011 (Waters Only) | Semivolatiles 8270D/SIM (with low-level PAHs) | PAHs 8270D/SIM (low-level) | PCBs 8082A | Organochlorine Pesticides 8081B | Organophosphorus Pesticides 8270D/SIM | Chlorinated Acid Herbicides 8151A | Total PCRA Metals | Total MTCA Metals | TCLP Metals | HEM (oil and grease) 1664A | Total Cu and Zn | PAHs | Phthalates | TOC | Moisture | Total Solids | |
|--------|-----------------------|--------------|--------------|----------|----------------------|------------|---------------|----------|---|-----------------|-----------------------------|----------------------------|---|----------------------------|------------|---------------------------------|---------------------------------------|-----------------------------------|-------------------|-------------------|-------------|----------------------------|-----------------|------|------------|-----|----------|--------------|---|
| 1 | MONT-1M-2018 | 9.10.18 | 0935 | Sediment | 1 | | | | | | | | | | | | | | | | | | X | | | | | X | |
| 2 | MONT-1R-2018 | 9.10.18 | 0935 | | 1 | | | | | | | | | | | | | | | | | | | X | X | X | X | | |
| 3 | MONT-2M-2018 | 9.10.18 | 1430 | | 1 | | | | | | | | | | | | | | | | | | | X | | | | | X |
| 4 | MONT-2R-2018 | 9.10.18 | 1430 | | 1 | | | | | | | | | | | | | | | | | | | X | X | X | X | | |
| 5 | EVAMS-1M-2018 | 9.10.18 | 0820 | | 1 | | | | | | | | | | | | | | | | | | | X | | | | | X |
| 6 | EVAMS-1R-2018 | 9.10.18 | 0820 | | 1 | | | | | | | | | | | | | | | | | | | X | X | X | X | | |
| 7 | EVALSS-1M-2018 | 9.10.18 | 1405 | | 1 | | | | | | | | | | | | | | | | | | | X | | | | | X |
| 8 | EVALSS-1R-2018 | 9.10.18 | 1405 | | 1 | | | | | | | | | | | | | | | | | | | X | X | X | X | | |
| 9 | TOSH-4M-2018 | 9.11.18 | 0840 | | 1 | | | | | | | | | | | | | | | | | | | X | | | | | X |
| 10 | TOSH-4R-2018 | 9.11.18 | 0840 | | 1 | | | | | | | | | | | | | | | | | | | X | X | X | X | | |

| Signature | Company | Date | Time | Comments/Special Instructions |
|---------------|---------------|---------|------|---|
| | Herrera | 9.12.18 | 1500 | |
| | Onsite | 9.12.18 | 1500 | |
| Relinquished | | | | |
| Received | | | | |
| Relinquished | | | | |
| Received | | | | |
| Relinquished | | | | |
| Received | | | | Data Package: Standard <input type="checkbox"/> Level III <input type="checkbox"/> Level IV <input type="checkbox"/> |
| Reviewed/Date | Reviewed/Date | | | Chromatograms with final report <input type="checkbox"/> Electronic Data Deliverables (EDDs) <input type="checkbox"/> |

2540g

Chain of Custody

Company: Herrera
 Project Number: 14-05806-000
 Project Name: RPWS
 Project Manager: John Lentz
 Sampled by: Brianna Bland

Turnaround Request (in working days)

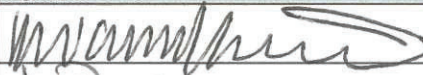

(Check One)

Same Day 1 Day
 2 Days 3 Days
 Standard (7 Days)
 _____ (other)

Laboratory Number: **09-115**

| Lab ID | Sample Identification | Date Sampled | Time Sampled | Matrix | Number of Containers |
|--------|-----------------------|--------------|--------------|----------|----------------------|
| 11 | TOSH-2M-2018 | 9.11.18 | 1430 | Sediment | 1 |
| 12 | TOSH-2R-2018 | 9.11.18 | 1430 | | 1 |
| 13 | SIDL-1M-2018 | 9.12.18 | 0840 | | 1 |
| 14 | SIDL-1R-2018 | 9.12.18 | 0840 | | 1 |

| NWTPH-HCID | NWTPH-Gx/BTEX | NWTPH-Gx | NWTPH-Dx (□ Acid / SG Clean-up) | Volatiles 8260C | Halogenated Volatiles 8260C | EDB EPA 8011 (Waters Only) | Semivolatiles 8270D/SIM (with low-level PAHs) | PAHs 8270D/SIM (low-level) | PCBs 8082A | Organochlorine Pesticides 8081B | Organophosphorus Pesticides 8270D/SIM | Chlorinated Acid Herbicides 8151A | Total RCRA Metals | Total MTCA Metals | TCLP Metals | HEM (oil and grease) 1664A | Total Cu Pb Zn | PAHs | Phthalates | TOC | Moisture | Total Solids |
|------------|---------------|----------|---------------------------------|-----------------|-----------------------------|----------------------------|---|----------------------------|------------|---------------------------------|---------------------------------------|-----------------------------------|-------------------|-------------------|-------------|----------------------------|----------------|------|------------|-----|----------|--------------|
| | | | | | | | | | | | | | | | | | X | | | | | X |
| | | | | | | | | | | | | | | | | | | X | X | X | X | X |
| | | | | | | | | | | | | | | | | | X | | | | | X |
| | | | | | | | | | | | | | | | | | | X | X | X | X | X |

| Signature | Company | Date | Time | Comments/Special Instructions |
|---|---------------|---|------|-------------------------------|
|  | Herrera | 9.12.18 | 1500 | |
|  | Onsite | 9.12.18 | 1500 | |
| Relinquished | | | | |
| Received | | | | |
| Relinquished | | | | |
| Received | | | | |
| Relinquished | | | | |
| Received | | | | |
| Reviewed/Date | Reviewed/Date | Data Package: Standard <input type="checkbox"/> Level III <input type="checkbox"/> Level IV <input type="checkbox"/> | | |
| | | Chromatograms with final report <input type="checkbox"/> Electronic Data Deliverables (EDDs) <input type="checkbox"/> | | |



Data Quality Assurance Worksheet

Project Name/No./Client: Redmond Paired Watershed Study / 14-05806-000 / City of Redmond
 Laboratory/Parameters: OnSite Environmental : TOC, Cu, Zn, PAHs, phthalates
 Sample Date/Sample ID: 9/6-12/2018 / MONT-1, MONT-2, EVAMS-1, EVALSS-1, TOSH-4,TOSH-2, SIDL-1

By G. Catarra
 Date 10/17/2018 Page 1 of 1
 Checked: initials JL
 date 10/17/2018

| Parameter | Completeness/ Methodology | Pre-extraction Holding Times (minutes) | | Total Holding Times (days) | | Method Blanks Reporting Limit | Matrix Spikes/ Surrogate Recovery (%) | | Lab Control Samples Recovery (%) | | Lab Duplicates RPD (%) | | Field Duplicates RPD (%) | | Instrument Calibration/ Performance | ACTION |
|------------|------------------------------|--|------|-------------------------------|------|--|---|--------------------|--|------------|---------------------------|-------------------|-----------------------------|-------------------|---|--------|
| | | Reported | Goal | Reported | Goal | | Reported | Goal | Reported | Goal | Reported | Goal ¹ | Reported | Goal ¹ | | |
| TOC | OK / EPA 9060A | NA | NA | 7-13 | ≤14 | ≤0.05% 0.05 % | NA | NA | 105 | ±20 | 12 | ≤20 | NS | ≤35 | OK | NONE |
| Copper | OK / EPA 6020 | NA | NA | 22-28 | ≤180 | ≤1.0 MG/KG 1.0 MG/KG | 102,102 | ±25 | NR | ±15 | 2 | ≤20 | NS | ≤35 | OK | NONE |
| Zinc | OK / EPA 6020 | NA | NA | 22-28 | ≤180 | ≤2.5 mg/kg 2.5 MG/KG | 99,98 | ±25 | NR | ±15 | 0 | ≤20 | NS | ≤35 | OK | NONE |
| PAHs | OK / EPA 8270D/SIM | 2-8 | ≤14 | 1-4 | ≤40 | ≤20 ug/kg 16-20 UG/KG | NR | NA / 21- 120 | 70-96 | 25- 141 | BS/BSD 3-10 | ≤40 | NS | ≤50 | OK | NONE |
| Phthalates | OK / EPA 8270D | 2-8 | ≤14 | 1-4 | ≤40 | ≤0.1 MG/KG 2-2.5 MG/KG | NR | NA / 21- 120 | 70-96 | 25- 141 | BS/BSD 3-10 | ≤40 | NS | ≤50 | OK | NONE |

¹ If the sample or duplicate value is less than five times the reporting limit, the difference is calculated rather than the relative percent difference (RPD). The QA goal is a difference <2 times the detection limit instead of the number indicated in the goal column.

NA – not applicable or not available; NC – not calculable due to one or more values below the detection limit; NS – field duplicate not sampled.

APPENDIX P

Data Validation Memorandum for Sediment Quality Monitoring

Herrera Environmental Consultants, Inc.

Internal Memorandum

Date: December 28, 2018
To: Project File 14-05806-019
Copy To:
From: Gina Catarra
Subject: Data Quality Assurance Review of the Redmond Paired Watershed Stormwater Retrofit Effectiveness Sediment Quality Monitoring Data

This memorandum presents a review of data quality for 20 sediment samples (including one field duplicate) collected for the Redmond Paired Watershed Stormwater Retrofit Effectiveness Study between July 5 and September 12, 2018. Onsite Environmental, Inc., of Redmond, Washington analyzed the samples for:

- Total organic carbon (TOC) by EPA method 9060A
- Metals (copper and zinc) by EPA method 6020
- Polycyclic aromatic hydrocarbons (PAHs) by EPA method 8270D/SIM
- Phthalates by EPA method 8270D.

Results for the following samples were validated.

| Date Collected | Lab SDG | Samples Collected | QC Samples Collected |
|----------------|----------|---|------------------------|
| 7/05-06/18 | 1807-035 | COLIN-1 and MONT-5 | None |
| 7/13-20/18 | 1807-140 | TYLR-1, SIDL-3, and TOSH-3 | None |
| 7/25-8/03/18 | 1808-051 | MONT-4, MONT-3, TYLR-2, TOSH-1 | 1 field duplicate (QA) |
| 8/09-23/18 | 1808-260 | CTRY-2, CTRY-1, SIDL-2 | None |
| 9/06-12/18 | 1809-115 | MONT-1, MONT-2, EVAMS-1, EVALSS-1, TOSH-4, TOSH-2, SIDL-1 | None |

The laboratory's performance was reviewed in accordance with quality control (QC) criteria established in the *Redmond Paired Watershed Study Quality Assurance Project Plan (QAPP)* (Herrera 2015), by the laboratory, and in the specified methods.

Quality control data summaries submitted by the laboratory were reviewed; raw data were not submitted by the laboratory. Data Quality Assurance Worksheets were completed for each laboratory report and are included as an Attachment to this memorandum. Data qualifiers (flags) were added to the sample results in the laboratory reports. Data validation results are summarized below, followed by definitions of data qualifiers.

Custody, Preservation, Holding Times, and Completeness—Acceptable with Qualification

The samples were properly preserved and sample custody was maintained from sample collection to receipt at the laboratory. Samples were analyzed within the required method holding times, with the exception noted below. The laboratory reports were complete and contained results for all samples and tests requested on the chain-of-custody (COC) forms.

The holding time for extraction (14 days) was exceeded by 13 days for sample CTRY-2 for PAHs and phthalates. Sample results were qualified as estimated (flagged J) or estimated detection limit (UJ) due to the holding time exceedance, as shown in the table below.

| Date Collected | Lab SDG | Sample Location | Parameter | Reason for Qualification | Flag |
|----------------|----------|-----------------|---------------------|--------------------------|---------|
| 8/09/18 | 1808-260 | CTRY-2 | PAHs and phthalates | Holding time exceedance | J or UJ |

Laboratory Reporting Limits—Acceptable

The laboratory reporting limits met those established in the QAPP. No data were qualified based on laboratory reporting limits.

Method Blank Analysis—Acceptable

Method blanks were analyzed at the required frequency. Method blanks did not contain levels of target analytes above the laboratory reporting limits.

Laboratory Control Sample Analysis—Acceptable

Blank spike/blank spike duplicate (BS/BSD) samples were analyzed with project samples for TOC, PAHs, and phthalates at the required frequency. The percent recovery values for all parameters met the criteria established in the QAPP.

Surrogate Compound Analysis—Acceptable

Surrogates were analyzed with project samples, method blanks, and laboratory duplicates for PAHs and phthalates, as required by the analytical methods. The percent recovery values for all surrogate compounds met the criteria established by the laboratory.

Matrix Spike Analysis—Acceptable

Matrix spike/matrix spike duplicate (MS/MSD) samples were analyzed for copper and zinc at the required frequency. The percent recovery values for copper (102 percent) and zinc (98 and 99 percent) met the control limits (75 to 125 percent) established in the QAPP.

Laboratory Duplicate Analysis—Acceptable

Laboratory duplicate samples were analyzed for TOC, copper, and zinc; BS/BSD samples were analyzed for PAHs and phthalates. The relative percent difference (RPD) was calculated for each analyte where both duplicate values were greater than five times the reporting limit (RL). The difference between duplicate values was calculated if the detected compound concentration was less than five times the RL in either the sample or the duplicate. The RPD values or difference values met the control limits established by the QAPP.

Field Duplicate Analysis—Acceptable

A field duplicate (QA) of sample MONT-3 was collected and analyzed for all parameters. However, the QAPP specifies that two field duplicate samples will be collected and analyzed for each annual sampling event. The RPD was calculated for each analyte where both the values were greater than five times the RL. The difference between the duplicate values was calculated if the detected compound concentration was less than five times the RL in either the sample or the field duplicate. The RPD values or difference values met the control limits established in the QAPP.

DEFINITION OF DATA QUALIFIERS

The following are data qualifier definitions applied for this project.

| Data Qualifier | Definition |
|----------------|---|
| J | Value is an estimate based on analytical results |
| R | Value is rejected based on analytical results |
| U | Value is below the reporting limit |
| UJ | Value is below the reporting limit and is an estimate based on analytical results |

REFERENCES

Herrera. 2015. Redmond Paired Watershed Study Quality Assurance Project Plan. Prepared by Herrera Environmental Consultants, Inc., Seattle, Washington. December 31.

APPENDIX Q

Laboratory Report for Biological Monitoring

The contents of this appendix are provided in an electronic file only.

APPENDIX R

Quality Assurance Review Documentation for Biological Monitoring

Taxonomy ID QC Percent Similarity

Report Count: 6

7979.1-4

Comparison Date: 11/16/2018 02:20:59

Component: Chironomidae

Collection Date **Sample ID**

07/05/2018 COLIN

| TIN | TAXON | NOTE | Original Taxonomist - W. Hoiland | | | | QC Taxonomist - G. Wallace | | | | DIFF. |
|-----|-----------------------|------|----------------------------------|----|---|---|----------------------------|----|---|---|----------------------------|
| | | | AB | L | P | A | AB | L | P | A | |
| 831 | Brillia | | 18 | 18 | 0 | 0 | 18 | 18 | 0 | 0 | 0 |
| 895 | Parametricnemus | | 2 | 2 | 0 | 0 | 2 | 2 | 0 | 0 | 0 |
| 920 | Tvetenia bavarica gr. | | 4 | 4 | 0 | 0 | 3 | 3 | 0 | 0 | 1 |
| 807 | Zavreliomyia | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | | 24 | | | | 23 | | | | Difference = 1 |
| | | | | | | | | | | | Percent Similarity = 96.38 |

Taxonomy ID QC Percent Similarity

Report Count: 6

7979.1-4

Comparison Date: 11/20/2018 08:46:39

Component: General

Collection Date **Sample ID**

07/05/2018 COLIN

| TIN | TAXON | NOTE | Original Taxonomist - A. Navesky | | | | QC Taxonomist - J. Pfeiffer | | | | DIFF. | |
|------|-------------------------------|------------------|----------------------------------|----|---|---|-----------------------------|----|---|---|-------|----|
| | | | AB | L | P | A | AB | L | P | A | | |
| 261 | Ameletus | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 145 | Baetis | heads | 8 | 8 | 0 | 0 | 8 | 8 | 0 | 0 | | 0 |
| 699 | Ceratopogonidae | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | 0 |
| 2013 | Chelifera/Metachela | | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | | -1 |
| 202 | Cinygma | | 74 | 74 | 0 | 0 | 75 | 75 | 0 | 0 | | -1 |
| 751 | Dicranota | | 4 | 4 | 0 | 0 | 4 | 4 | 0 | 0 | | 0 |
| 706 | Dixa | | 1 | 1 | 0 | 0 | 1 | 1 | 0 | 0 | | 0 |
| 707 | Dixella | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | 0 |
| 709 | Empididae | | 2 | 1 | 1 | 0 | 1 | 0 | 1 | 0 | | 1 |
| 390 | Kogotus | | 3 | 3 | 0 | 0 | 4 | 4 | 0 | 0 | | -1 |
| 237 | Leptophlebiidae | or missing gills | 2 | 2 | 0 | 0 | 2 | 2 | 0 | 0 | | 0 |
| 338 | Malenka | | 1 | 1 | 0 | 0 | 1 | 1 | 0 | 0 | | 0 |
| 67 | Nematoda | | 2 | 2 | 0 | 0 | 2 | 2 | 0 | 0 | | 0 |
| 517 | Parapsyche | | 1 | 1 | 0 | 0 | 1 | 1 | 0 | 0 | | 0 |
| 759 | Pedicia | | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | | -1 |
| 380 | Perlodidae | | 3 | 3 | 0 | 0 | 2 | 2 | 0 | 0 | | 1 |
| 103 | Pisidium | | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | | 1 |
| 678 | Rhyacophila | | 3 | 0 | 3 | 0 | 3 | 0 | 3 | 0 | | 0 |
| 664 | Rhyacophila brunnea/vemna gr. | | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | | 1 |
| 1410 | Rhyacophila grandis gr. | | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | | -1 |
| 738 | Simulium | | 4 | 3 | 1 | 0 | 4 | 3 | 1 | 0 | | 0 |

Taxonomy ID QC Percent Similarity

Report Count: 6

7979.1-4

Comparison Date: 11/20/2018 08:46:39

Component: General

(Cont'd.)

| Collection Date | | Sample ID | | Original Taxonomist - A. Navesky | | | | QC Taxonomist - J. Pfeiffer | | | | DIFF. | |
|-----------------|-------------|-----------|-----|----------------------------------|---|---|----|-----------------------------|---|---|----------------------|-------|--|
| TIN | TAXON | NOTE | AB | L | P | A | AB | L | P | A | NOTE | | |
| 07/05/2018 | COLIN | | | | | | | | | | | | |
| 3002 | Sperchon | | 7 | 0 | 0 | 7 | 7 | 7 | 0 | 0 | | 0 | |
| 101 | Sphaeriidae | | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | | -1 | |
| 321 | Sweltsa | | 44 | 44 | 0 | 0 | 43 | 43 | 0 | 0 | | 1 | |
| 764 | Tipula | | 1 | 1 | 0 | 0 | 1 | 1 | 0 | 0 | | 0 | |
| | | | 162 | | | | | 163 | | | | | |
| | | | | | | | | | | | Difference = | -1 | |
| | | | | | | | | | | | Percent Similarity = | 96.61 | |

Taxonomy ID QC Percent Similarity

Report Count: 6

7979.1-4

Comparison Date: 11/17/2018 07:33:05

Component: Oligochaete

Collection Date **Sample ID**

07/05/2018 COLIN

| TIN | TAXON | NOTE | Original Taxonomist - L. Flaherty | | | | QC Taxonomist - G. Wallace | | | | DIFF. |
|------|----------------------------------|------|-----------------------------------|----|---|---|----------------------------|----|---|---|----------------------------|
| | | | AB | L | P | A | AB | L | P | A | |
| 9 | Enchytraeidae | | 5 | 5 | 0 | 0 | 5 | 5 | 0 | 0 | 0 |
| 2698 | Haplotaxis | RC#7 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1047 | Hirudinida | RC#6 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 5 | Lumbricina | | 5 | 5 | 0 | 0 | 5 | 5 | 0 | 0 | 2 in vial |
| 6 | Lumbriculidae | | 26 | 26 | 0 | 0 | 32 | 32 | 0 | 0 | -6 |
| 2695 | Rhyacodrilus | RC#5 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1347 | tubificoid Naididae w/ cap setae | | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | ¹ LT7 |
| | | | 36 | | | | 43 | | | | Difference = -7 |
| | | | | | | | | | | | Percent Similarity = 95.48 |

Taxonomy ID QC Percent Similarity

Report Count: 6

7979.1-19

Comparison Date: 11/16/2018 01:45:35

Component: Chironomidae

Collection Date **Sample ID**

08/09/2018 CTRY-2

| TIN | TAXON | NOTE | Original Taxonomist - W. Hoiland | | | | QC Taxonomist - G. Wallace | | | | | DIFF. |
|-------|---------------------------------------|------|----------------------------------|----|---|---|----------------------------|----|---|---|------|----------------------------|
| | | | AB | L | P | A | AB | L | P | A | NOTE | |
| 831 | Brillia | | 7 | 7 | 0 | 0 | 7 | 7 | 0 | 0 | | 0 |
| 2213 | Brundiniella | | 5 | 5 | 0 | 0 | 5 | 5 | 0 | 0 | | 0 |
| 838 | Corynoneura | | 2 | 2 | 0 | 0 | 2 | 2 | 0 | 0 | | 0 |
| 854 | Diplocladius | | 1 | 1 | 0 | 0 | 1 | 1 | 0 | 0 | | 0 |
| 859 | Eukiefferiella coerulescens gr. | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | 0 |
| 1054 | Micropsectra | | 16 | 16 | 0 | 0 | 15 | 15 | 0 | 0 | | 1 |
| 889 | Orthocladius (Symposiocladius) lignic | | 1 | 1 | 0 | 0 | 1 | 1 | 0 | 0 | | 0 |
| 895 | Parametriochnemus | | 2 | 2 | 0 | 0 | 2 | 2 | 0 | 0 | | 0 |
| 970 | Paratendipes | | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | | 0 |
| 11951 | Psilometriochnemus triannulatus | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | 0 |
| 920 | Tvetenia bavarica gr. | | 4 | 4 | 0 | 0 | 3 | 3 | 0 | 0 | | 1 |
| 807 | Zavreliomyia | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | 0 |
| | | | 38 | | | | 36 | | | | | Difference = 2 |
| | | | | | | | | | | | | Percent Similarity = 97.37 |

Taxonomy ID QC Percent Similarity

Report Count: 6

7979.1-19

Comparison Date: 11/20/2018 08:47:43

Component: General

Collection Date **Sample ID**

08/09/2018 CTRY-2

| TIN | TAXON | NOTE | Original Taxonomist - A. Navesky | | | | QC Taxonomist - J. Pfeiffer | | | | | DIFF. |
|------|------------------|----------------------------|----------------------------------|----|---|---|-----------------------------|----|---|---|------|-------|
| | | | AB | L | P | A | AB | L | P | A | NOTE | |
| 126 | Acari | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | 0 |
| 1868 | Ametor | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | 0 |
| 3041 | Atractides | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | 0 |
| 145 | Baetis | | 17 | 17 | 0 | 0 | 17 | 17 | 0 | 0 | | 0 |
| 3034 | Bezzia/Palpomyia | | 5 | 5 | 0 | 0 | 3 | 3 | 0 | 0 | | 2 |
| 313 | Chloroperlidae | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | 0 |
| 202 | Cinygma | | 45 | 45 | 0 | 0 | 44 | 44 | 0 | 0 | | 1 |
| 751 | Dicranota | | 12 | 12 | 0 | 0 | 11 | 11 | 0 | 0 | | 1 |
| 706 | Dixa | | 10 | 10 | 0 | 0 | 10 | 10 | 0 | 0 | | 0 |
| 536 | Glossosoma | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | 0 |
| 565 | Hydropsyche | | 1 | 1 | 0 | 0 | 1 | 1 | 0 | 0 | | 0 |
| 3154 | Hydryphantidae | | 1 | 0 | 0 | 1 | 1 | 1 | 0 | 0 | | 0 |
| 1305 | Lara | | 9 | 9 | 0 | 0 | 9 | 9 | 0 | 0 | | 0 |
| 237 | Leptophlebiidae | missing gills or head only | 19 | 19 | 0 | 0 | 17 | 17 | 0 | 0 | | 2 |
| 756 | Limnophila | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | 0 |
| 338 | Malenka | | 39 | 39 | 0 | 0 | 35 | 35 | 0 | 0 | | 4 |
| 708 | Meringodixa | | 1 | 1 | 0 | 0 | 1 | 1 | 0 | 0 | | 0 |
| 67 | Nematoda | | 5 | 5 | 0 | 0 | 4 | 4 | 0 | 0 | | 1 |
| 333 | Nemouridae | | 12 | 12 | 0 | 0 | 12 | 12 | 0 | 0 | | 0 |
| 246 | Paraleptophlebia | | 0 | 0 | 0 | 0 | 2 | 2 | 0 | 0 | | -2 |
| 517 | Parapsyche | | 3 | 3 | 0 | 0 | 3 | 3 | 0 | 0 | | 0 |

Taxonomy ID QC Percent Similarity

Report Count: 6

7979.1-19

Comparison Date: 11/20/2018 08:47:43

Component: General

(Cont'd.)

Collection Date **Sample ID**

08/09/2018 CTRY-2

| TIN | TAXON | NOTE | Original Taxonomist - A. Navesky | | | | QC Taxonomist - J. Pfeiffer | | | | DIFF. | |
|------|---------------------------|------|----------------------------------|-----|---|---|-----------------------------|-----|---|---|----------------------------|----|
| | | | AB | L | P | A | AB | L | P | A | | |
| 760 | Pilaria | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 103 | Pisidium | | 7 | 7 | 0 | 0 | 3 | 3 | 0 | 0 | | 4 |
| 95 | Planorbidae | | 1 | 1 | 0 | 0 | 3 | 3 | 0 | 0 | | -2 |
| 3490 | Promenetus umbilicatellus | | 2 | 2 | 0 | 0 | 2 | 2 | 0 | 0 | | 0 |
| 1087 | Ptychoptera | | 5 | 5 | 0 | 0 | 5 | 5 | 0 | 0 | | 0 |
| 662 | Rhyacophila betteni gr. | | 7 | 7 | 0 | 0 | 7 | 7 | 0 | 0 | | 0 |
| 1410 | Rhyacophila grandis gr. | | 1 | 1 | 0 | 0 | 1 | 1 | 0 | 0 | | 0 |
| 738 | Simulium | | 107 | 107 | 0 | 0 | 104 | 104 | 0 | 0 | | 3 |
| 3002 | Sperchon | | 5 | 0 | 0 | 5 | 5 | 5 | 0 | 0 | | 0 |
| 101 | Sphaeriidae | | 0 | 0 | 0 | 0 | 3 | 3 | 0 | 0 | | -3 |
| 321 | Sweltsa | | 27 | 27 | 0 | 0 | 27 | 27 | 0 | 0 | | 0 |
| 1082 | Thaumaleidae | | 5 | 5 | 0 | 0 | 5 | 5 | 0 | 0 | | 0 |
| 764 | Tipula | | 2 | 2 | 0 | 0 | 2 | 2 | 0 | 0 | | 0 |
| 2 | Turbellaria | | 53 | 53 | 0 | 0 | 57 | 57 | 0 | 0 | | -4 |
| 639 | Wormaldia | | 5 | 5 | 0 | 0 | 5 | 5 | 0 | 0 | | 0 |
| 345 | Zapada cinctipes | | 53 | 53 | 0 | 0 | 58 | 58 | 0 | 0 | | -5 |
| 349 | Zapada oregonensis gr. | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | 0 |
| | | | 459 | | | | 457 | | | | Difference = 2 | |
| | | | | | | | | | | | Percent Similarity = 96.29 | |

Taxonomy ID QC Percent Similarity

Report Count: 6

7979.1-19

Comparison Date: 11/17/2018 07:43:32

Component: Oligochaete

Collection Date **Sample ID**

08/09/2018 CTRY-2

| TIN | TAXON | NOTE | Original Taxonomist - L. Flaherty | | | | QC Taxonomist - G. Wallace | | | | DIFF. | | | |
|------|-----------------------------------|------|-----------------------------------|---|---|---|----------------------------|---|---|---|--------------|----|----------------------|-------|
| | | | AB | L | P | A | AB | L | P | A | | | | |
| 9 | Enchytraeidae | | 4 | 4 | 0 | 0 | 4 | 4 | 0 | 0 | 0 | | | |
| 5 | Lumbricina | | 5 | 5 | 0 | 0 | 6 | 6 | 0 | 0 | -1 | | | |
| 1347 | tubificoid Naididae w/ cap setae | | 4 | 4 | 0 | 0 | 4 | 4 | 0 | 0 | 0 | | | |
| 1348 | tubificoid Naididae w/o cap setae | | 1 | 1 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | | | |
| | | | 14 | | | | 15 | | | | Difference = | -1 | | |
| | | | | | | | | | | | | | Percent Similarity = | 95.71 |