

Water Quality Standards: Hydropower

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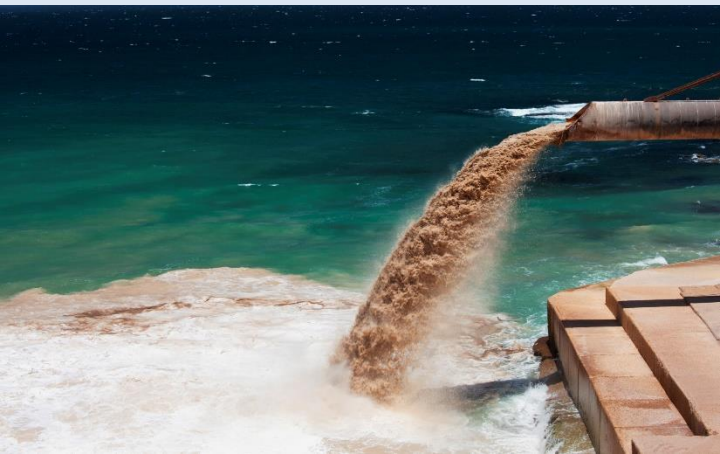
Overview

- Clean Water Act
- Introduction to Water Quality Standards
- 401 Water Quality Certifications
- Water Quality Tools
- Future Challenges



Clean Water Act

- **Objective**: “restore and maintain the chemical, physical, and biological integrity of the Nation’s waters” (CWA 101(a))
- **Goal**: “water quality which provides for the protection and propagation of fish, shellfish, and wildlife and provides for recreation in and on the water” (CWA 101(a)(2))



Clean Water Act Approach

- **Technological Goal**: achieve a specific level of end-of-pipe performance
 - Effluent limits are required of industrial and municipal dischargers for specific pollutants
 - Example: **secondary treatment for wastewater**
- **Water Quality Goal**: meet water quality standards (in receiving water)





Water Quality Standards

Components of Water Quality Standards

Three Components of WQS

DESIGNATED USES:
management objectives
for surface waters



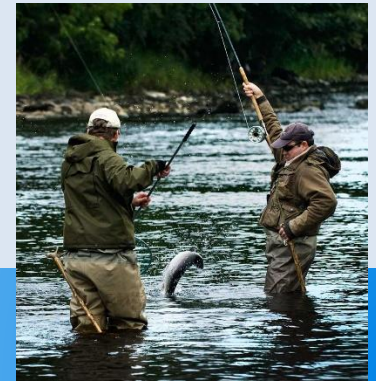
CRITERIA: levels of
water quality that will
support the designated
uses; expressed as
numeric values and/or
narrative statements

ANTIDEGRADATION POLICY AND METHODS:
framework for maintaining and protecting water
quality that has already been achieved



Designated Uses

- Definition: “those uses specified in the water quality standard regulations for each water body or segment whether or not they are being attained
 - Interpretation:
 - Goals/Objectives/Desired conditions of a water body
 - Ex. Fishable and swimmable uses; aquatic life uses
- Designated uses establish water quality goals
 - Determines appropriate criteria to meet goals
 - Requires protection of downstream waters



Water Quality Criteria

- Defined: Elements of state/tribe water quality standards, expressed as a constituent concentration, levels, or narrative statements, representing a quality of water that supports a particular use
- When criteria are met, water quality will generally support the designated use
- Set to provide full protection for the **most sensitive use** – usually the most sensitive species and particular life stage



Types of Water Quality Criteria

- Aquatic life criteria
- Biological criteria
- Human health criteria
- Recreational criteria
- Other types: nutrient, sediment, aesthetics, etc...



Components of Criteria

■ Magnitude

- How much of a pollutant or measure of a condition (e.g. concentration)
- Example: 10 mg/L zinc

■ Duration

- Period of time over which the concentration is averaged
- Example: 1-day (acute); 7-day average concentration (chronic)

■ Frequency

- How often the average concentration can be exceeded
- Example: no more than one exceedance every three years



Narrative Criteria

- States/tribes should establish narrative criteria or criteria based on biomonitoring methods where numerical criteria cannot be established or to supplement numeric criteria
- Example:
 - Aesthetic values must not be impaired by the presence of materials or their effects, excluding those of natural origin, which offend the senses of sight, smell, touch, or taste



Antidegradation

- Tier I: protection and maintenance of existing and designated uses
 - Applies to existing dams
- Tier II: protection of waters of higher quality than the standards
 - Applies to new dams
- Tier III: protection of outstanding resources
 - Pristine waters where no pollution is allowed





401 Certification

401 Certification

- No federal permit or license can be issued that may result in a discharge to waters of the US

Unless...

- The state or authorized tribe certifies that the discharge is consistent with standards and other water quality goals



401 Certification

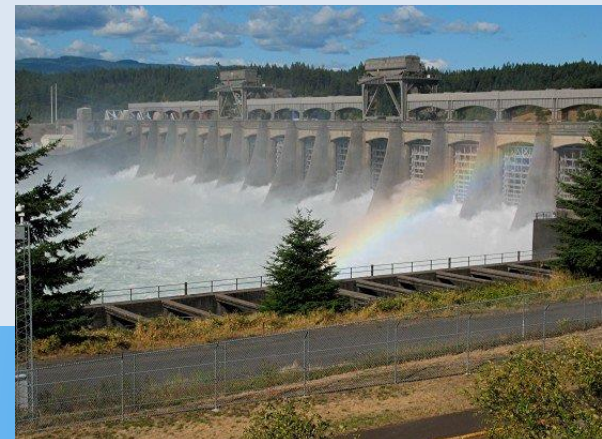
General steps in 401 Certification for FERC licenses:

1. Detailed schedule for gathering data
2. Study objectives for each water quality parameter
3. Initial study to determine all existing and designated uses
4. Quality assurance plan for each study
5. Study project's structures, operations, and activities' impacts on water quality
6. Develop a water quality attainment plan and compliance schedule for parameters not meeting WQS
7. Make commitments to assess new information to improve WQ
8. Send all materials to Ecology for review



401 Certification

- State/tribes consider:
 - All potential water quality impacts for the term of the license
- Decision based on:
 - Data and information from applicant
 - All other available and reliable data
 - Public input – current Ecology process includes a public review of the 401 certification for hydropower projects.



State/Tribe 401 Determinations

- Grant: indicates activity consistent with standards and other provisions
- Grant with conditions: indicates activity consistent only if listed conditions are met
- Waive: state/tribal agency decides to not act on 401 application request (401 cert not required)
- Deny: indicates activity is not consistent with water quality standards and other goals





Water Quality Tools: Hydropower

Water Quality Tools: Hydropower

- Basis for Tools:
 - Water quality standards intended to guide the process of restoration
 - Standards need not be the same for every water body
 - Standards should not be a barrier to achieving incremental water quality improvements
- Implementation Tools for Dams:
 - Dam compliance schedules
- Water Quality Criteria Tools for Dams:
 - Variance
 - Site-specific criteria
 - Use attainability analysis
- Formal rulemaking to change water quality standards





Implementation Tools

Dam Compliance Schedule

- Compliance schedules apply to:
 - Dams that cause or contribute to a violation of water quality standards
- Requirement:
 - Dam owner must develop a water quality attainment plan that provides a detailed strategy for achieving compliance



Dam Compliance Schedule

- Plan must include:
 - A compliance schedule that does not exceed 10 years
 - Identification of all reasonable and feasible improvements that could be used to meet standards or to achieve the highest attainable level of improvement
 - Department-approved gas abatement plan
 - Analytical methods used to evaluate all reasonable and feasible improvements
 - Water quality monitoring
 - Benchmarks and reporting to track applicant's progress



Dam Compliance Schedule

- If applicable water quality standards are not met by the end of the attainment plan, or after completion of all reasonable and feasible improvements, then:
 1. Evaluate any new reasonable and feasible technologies to achieve water quality standards, and develop a new compliance schedule to incorporate new technology
 2. If no reasonable and feasible improvements have been identified, then propose an alternative compliance with the water quality standards





Water Quality Tools

Water Quality Standard Variance

■ Variance:

- Time-limited designated use and criterion for a specific pollutant or water quality parameter(s) that reflect the highest attainable condition during the term of the variance
- Assumptions:
 - Water quality standard will be met by end of variance
 - Applies to specific parameters
 - Reasonable progress must be made toward meeting standards
- Types: individual, multi-discharger, & water body



Site Specific Criteria

- Purpose: a tool to tailor standards to local conditions & key species
 - Adjusts criteria that is protective of the designated use but specific to the site
 - Can be less or more stringent than currently approved standards

- Scenarios:
 1. Chemical and physical characteristics of site influence water quality differently than data used to develop criteria
 2. Species sensitivity differs from those used to develop criteria
 3. Naturally high background levels of a pollutant



Site Specific Criteria

■ Approaches:

- Resident species recalculation procedure
 - Accounts for differences between species used to develop existing criteria and the waterbody in question
- Reference water body approach
 - Compares the waterbody in question to a reference waterbody of similar conditions but is meeting designated uses
- Site water chemistry
 - Modification of criteria based on site specific chemical/physical characteristics



Use Attainability Analysis

Purpose: A study to determine the highest attainable uses which may result in the modification of designated uses of a water body

- Considers physical, chemical, biological, and sometimes economic factors
 - Example: modifying the aquatic life use from salmonid protection to warm water fishery
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- Sufficient information required to demonstrate that a current designated level of use is neither existing nor attainable

 - Some possibilities:
 - More protective use
 - Less protective use
 - Seasonal use

 - No guarantee a less protective use will be approved; may result in more protective use based on information provided

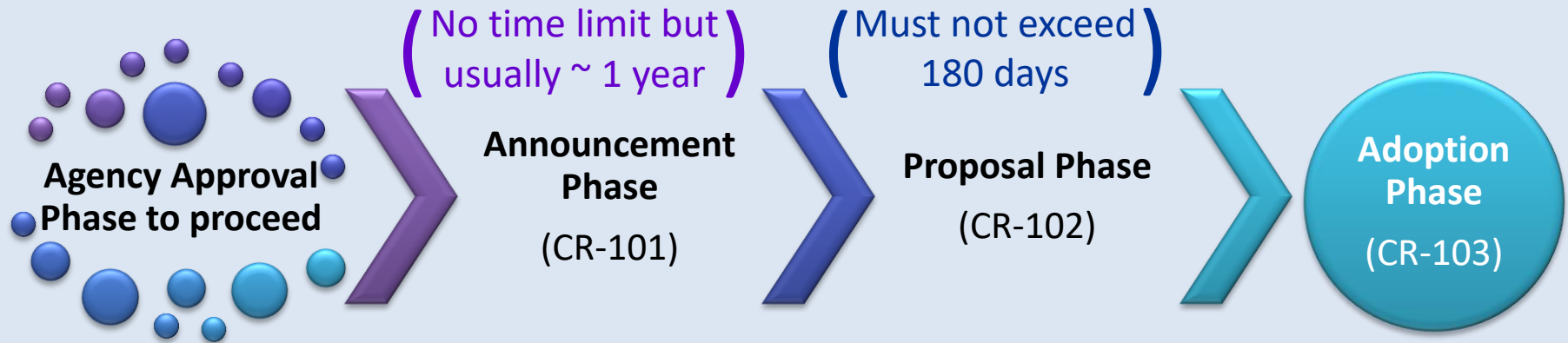


Use Attainability Analysis

- Six factors for removing uses:
 1. Natural occurring pollutant concentrations
 2. Natural, ephemeral, intermittent or low flow conditions or water levels prevent attainment of the use
 3. Human caused conditions or sources of pollution prevent the attainment of the use
 4. Dams, diversions or other hydrological modifications preclude the attainment of the use, and it is not feasible to restore the water body to its original condition
 5. Physical conditions related to the natural features of the water body
 6. Controls more stringent than those required by sections 301(b) and 306 of the CWA would result in substantial and widespread economic and social impact



Rulemaking Process



- **Approval Phase:** Internal approval by executive team
- **CR-101:** Data collection, stakeholder outreach, rule development
- **CR-102:** Release proposed rule, receive/respond comments
- **CR-103:** Adopt rule

Rulemaking process typically lasts a minimum of 1 to 1.5 years



Key Concepts

- Projects need to attain water quality standards or determine the highest attainable use using all reasonable and feasible improvements
- Dam compliance schedules may be extended if it meets justification in the rule
- Water quality tools are available when all options are exhausted to achieve water quality standards
- Public rulemaking process to use some water quality tools



Future Challenges

- Climate change
- Fluctuating hydrological cycles
- Aquatic life composition and stress tolerance
- Invasive species
- Degraded water quality
- Habitat degradation



Questions

