

# Site-specific Criteria Alaska

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Water Quality Standards



# Presentation

- 1) Site-specific Criteria Overview
- 2) What is your role and mine?
- 3) 7 Step generalized process
- 4) Example - Chuitna Mine Proposal

# Site-specific Criteria (SSC)

Criteria are designed to be protective of most systems, but it is understood that they may be *over-* or *under-*protective depending on site-specific conditions and aquatic community

# Site-specific Criteria (SSC)

Allowed by regulation and is subject to EPA review and approval

– purpose is to allow site specific criteria that reflect local environmental conditions.

Federal WQ Standards - 131.11(b)(1)(ii) provides - states with authority to ...modified to reflect site-specific conditions.

# Site-specific Criteria - SSC

SSC's:

- are based on sound scientific rationale in order to protect designated uses.
- based on appropriate procedures.

# Alaska Site-specific Regulations

18 AAC 70.235. Site-specific Criteria.  
(paraphrased) - **2003 WQS**

DEC will establish SSC in its discretion  
- in a permit, certification or approval by  
natural condition (specifies  
seasonal variability, monitoring)

Examples - 2 Waterbodies - main stem Red  
Dog & Ikalukrok and Goodpaster River valley

# Alaska Site-specific Regulations

If national or state criteria are more stringent or less stringent than necessary to ensure full protection of the corresponding use class by regulation.

Growth & Propagation of fish, shellfish, other aquatic life & wildlife use classes IF:

- species are present under natural conditions ... and alleviates unnecessary restrictive general criteria
- List of waterbodies subject to SSC.

# EPA Guidance

EPA Water Quality Standards Handbook – 1994

2 conditions that must be met for determining if a national water quality criteria is under or over protective:

- 1) species at site are more or less sensitive than those included in the national criteria
- 2) physical or chemical characteristics of site alter the biological availability or toxicology of the chemical.

# EPA Guidance –

## Water Quality Standards Handbook – 1994 - SSC

3 EPA procedures that address the 2 conditions:

1) **Recalculation Procedure** - comparison between the sensitivities of the site and national aquatic life species

2) **Water Effects Ratio** – looks at relevant differences between the toxicities of the chemical in lab dilution water and in site water.

3) **Resident Species Procedure** – intended to take into account both kinds of differences simultaneously

# EPA Guidance – WER

**Recalculation Procedure** - comparison between the sensitivities of the site and national aquatic life species

- The underlying database upon which criteria are based can be tailored to be protective of the site in question.
  - Recalculation procedure (U.S. EPA 1994)
- The resulting database is representative of the potential aquatic community at a given site and the recalculated, site-specific criteria should be protective of resident and potential resident species.

## EPA Guidance – Water Effects Ratio

The concept of a WER is straight forward:

Two side-by-side toxicity tests are conducted –

- 1 test using amended laboratory dilution water
- 2 other using amended site water.

The endpoint obtained using site water is divided by the endpoint obtained using laboratory dilution water. The quotient is the WER, which is multiplied times the national, state, or recalculated aquatic life criterion to calculate the site-specific criterion.

## EPA Guidance – Resident Species Procedure

- Site-specific habitat is evaluated.
- Site-specific aquatic communities are sampled and, if available, suitable monitoring data are reviewed.
- Each species in the toxicity database is evaluated to
  - determine if it is representative of a potential
  - resident species.
- If not, it is removed from the database.
  
- But, need to have  $\geq 8$  families of animals in the
- database to recalculate the criterion.

# ROLES

DEC permitting and water standards staff

- under written agreement

Water Quality Standards – Project Leader

- coordinating effected parties,
- draft decision document,
- lead public notice process and meetings,
- coordinate with EPA for CWA review and approval

# ROLES

## DEC permitting & Water Standards Staff

### DEC Permitting Staff –

- provides technical expertise , permitting , engineering and mathematical computations if necessary.
- attends meetings
- provides permitting guidance
- assists with public meetings

# First steps and considerations

- Permittee requests relief and claims **site specific conditions** warrant change in criteria.
- Burden of proof lies with permittee.
- New criteria must be adopted by DEC and approved by EPA.
- The methods and/or species used should be discussed early in the process with DEC and EPA.

# 7 Step Pattern for SSC Development

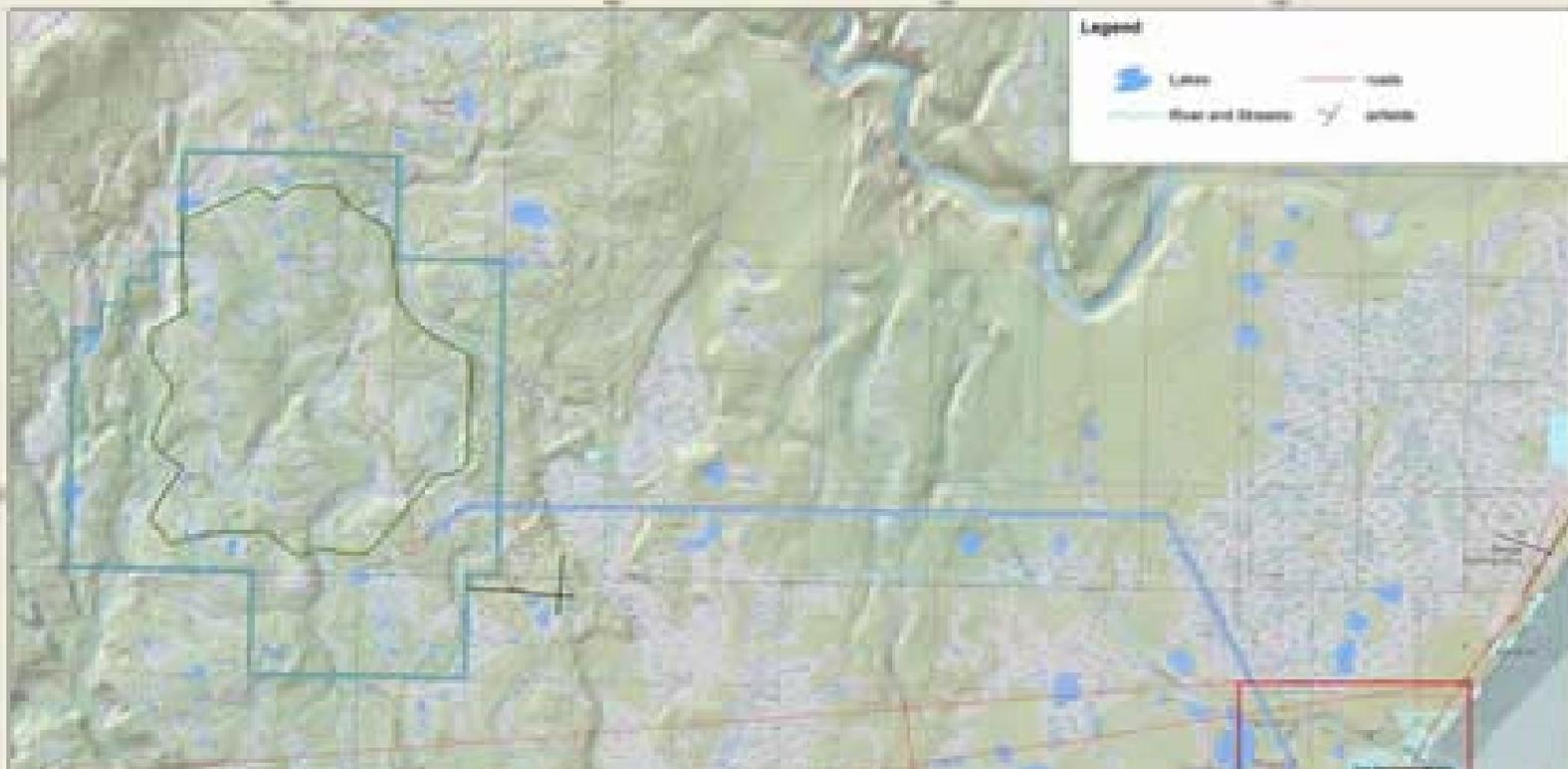
- Study Plan – what, approach, & QAQC
  - EPA- Upfront and technical reviews
  - Study Discussions –chemical, physical,& risk
  - Data reviews and discussion
  - Decision Document
    - Approvals DEC & EPA
    - Sometimes Appeals

**Legend**

- Lakes
- Roads
- River and Streams
- Airports

# Chuitna Coal Project Area Map

- Proposed Permit Areas**
- Pacifica Coal Lease
  - Lullu Landing Lease Area
- Proposed Facilities**
- Coal Conveyor
  - Tracks
  - Access
- Other Access Points**
- Logjam Mining Unit 1 (LJMU-1)
- Surface Ownership**
- State of Alaska
  - Mineral Health Unit
  - Tyonek Native Corporation
  - Coal seam Regional Inc.
  - Rural Petroleum Storage
  - Private
  - State Fish Lease



This map was prepared for the Chuitna Coal Project. It shows the proposed permit areas and facilities. The map is based on the best available data and is not intended to be used for any other purpose. The map is subject to change without notice.



Prepared by: [Company Name]  
 Date: [Date]  
 Scale: 1:50,000

# Chuitna Mine Proposal

6 Pollutants of concern:

**Aluminum, copper, lead, zinc, manganese, and iron**

Three different approaches

1) Metals – aluminum, copper, lead and zinc

Using the Water Effects Ratio

- single and multi-metal confirmation tests

# Chuitna Mine Proposal

## 2) Manganese

EPA's Drinking Water health Advisory for Manganese issued in 2004. Includes a generalized equation for deriving a water quality criteria

## 3) Iron

- some waterways have naturally high total iron
- some water ways have circumneutral or slightly basic pH.
- combination of pH and organic matter result in lower iron toxicity.
- biotic communities do not appear to be limited by iron concentrations.