

Overview of Upper Basin Focused Feasibility Study and ROD Amendment

EPA Region 10

February 10, 2010



Topics

- Quick Background on Bunker Hill/CDA Basin Superfund Site
- Development of new cleanup plan:
 - Draft Focused Feasibility Study
 - Proposed Plan (draft cleanup plan)
 - ROD Amendment
- Implementation Plan
- Community Engagement
- Schedule

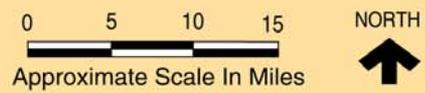
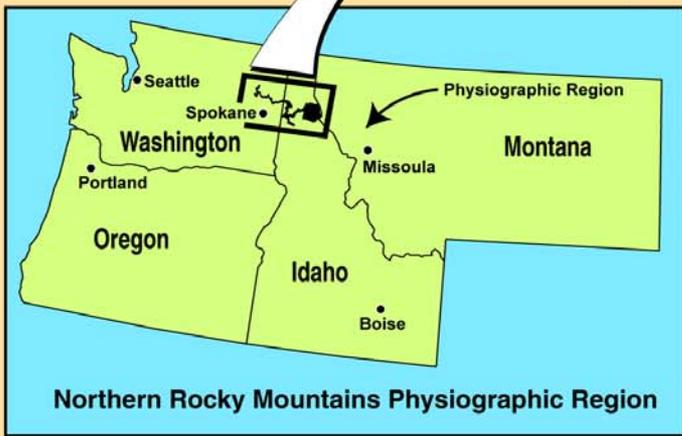


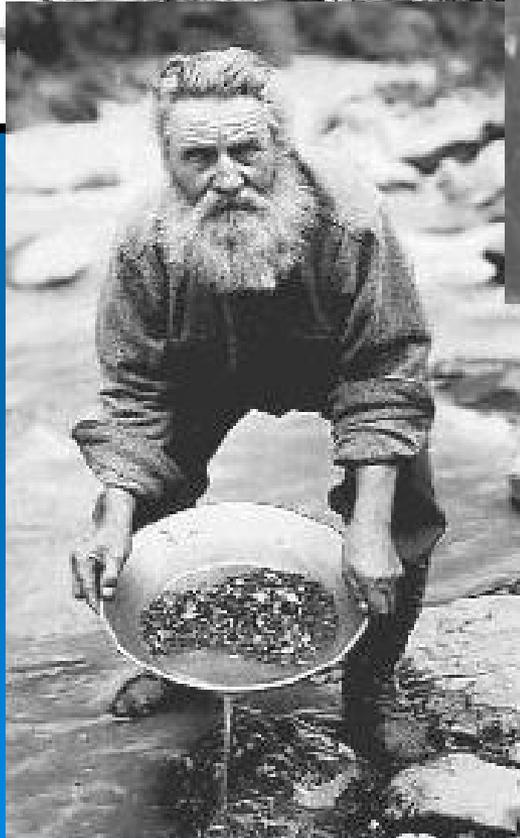
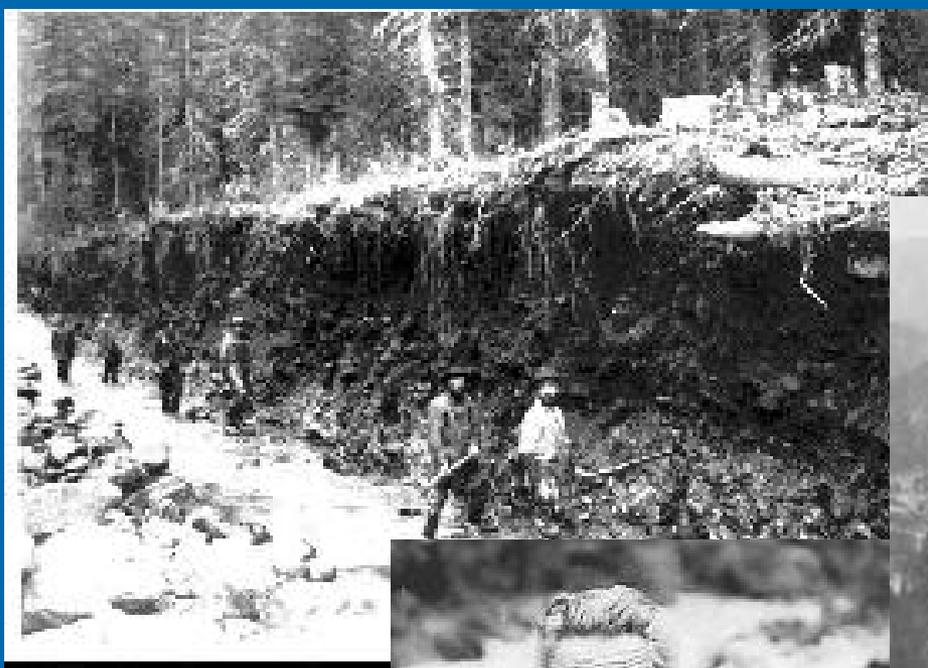
Franklin D. Roosevelt Lake
(Columbia River)

WASHINGTON

IDAHO

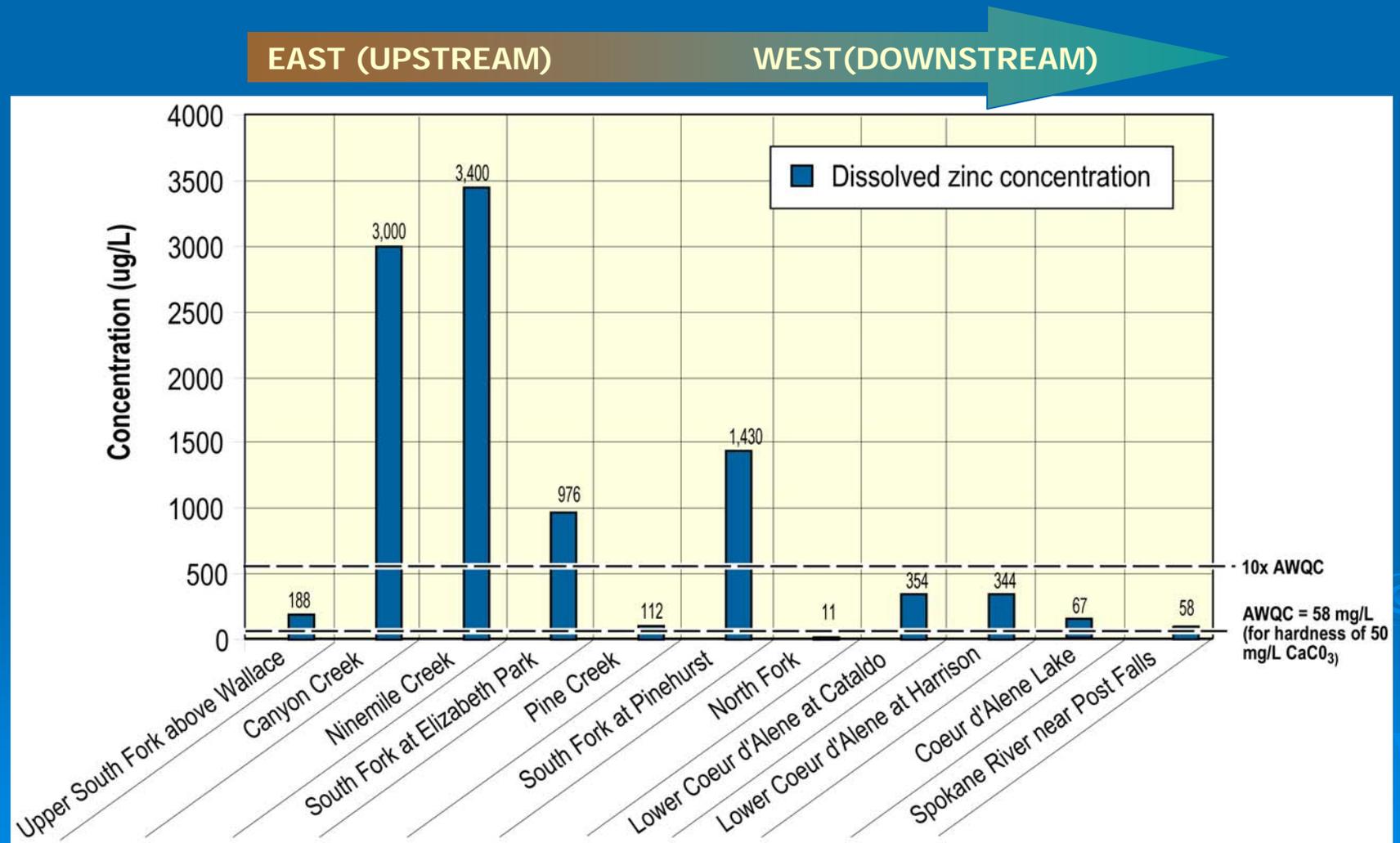
MONTANA





- Coeur d'Alene Basin impacted by over 100 years of mining
- Until 1968, 2200 tons/day of mine waste discharged directly to river

Zinc Exceedances Over Water Quality Criteria



Lead concentrations in soils and sediments

Lake Coeur
d'Alene →

Coeur d'Alene River

mg/kg lead

Value



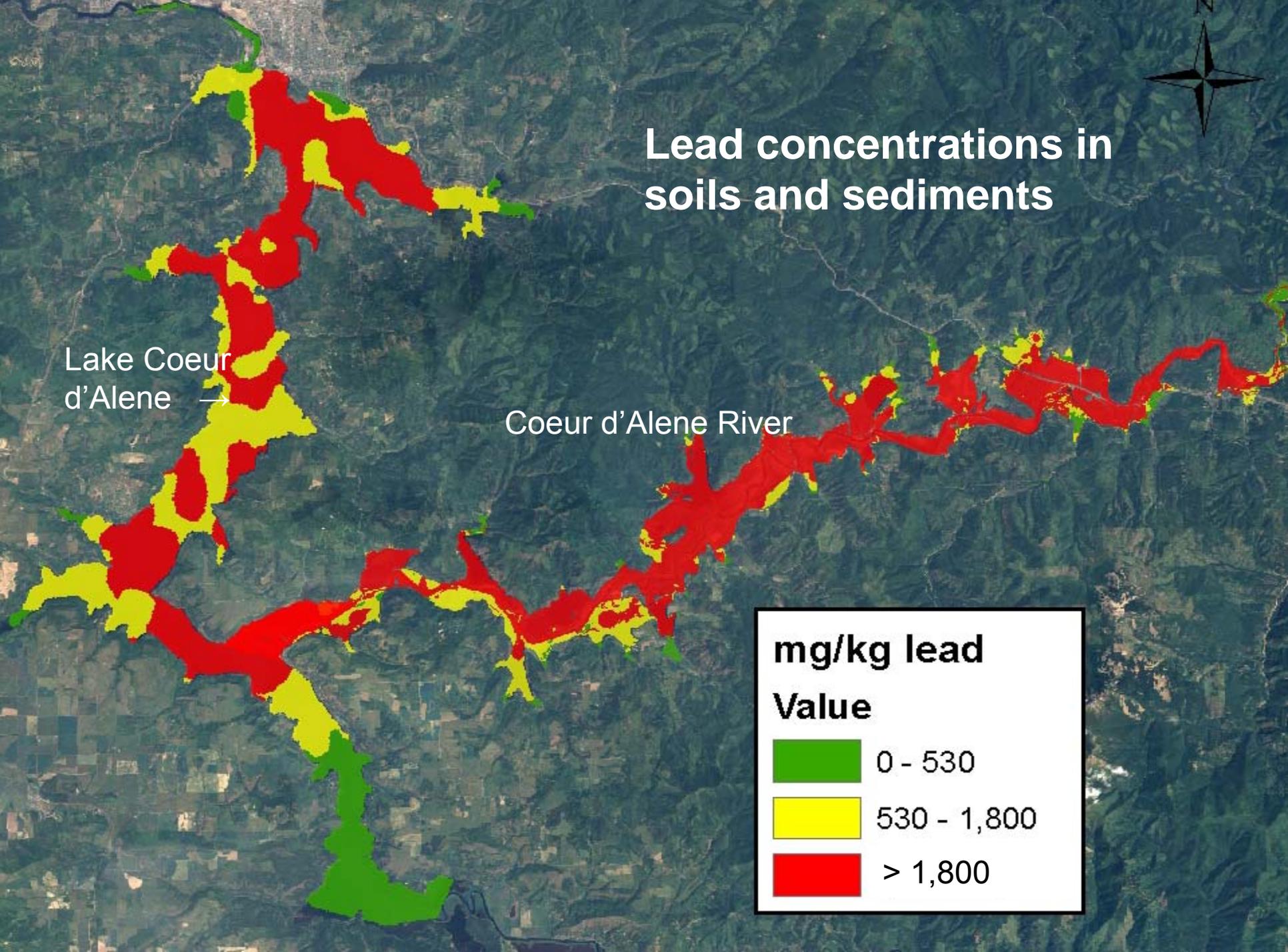
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Existing Records of Decision

➤ Bunker Hill RODs

- OU1 Populated Area
- OU2 Non-Populated Area of Box
- OU3 Interim ROD (Coeur d'Alene Basin)

➤ Elements of OU3 Interim ROD

- Basin Residential and Recreational Areas Cleanup
- Selected excavation, containment, disposal in Upper Basin
- Surface water treatment (in Canyon Creek) to address dissolved metals
- Capping and excavation in selected floodplain and banks in the Lower Basin

OU3 Interim ROD

- A suite of actions implemented over 30 years that make progress towards cleanup goals
- Overall Cost Approximately \$350 Million
- Estimated time to meet AWQC goal at Pinehurst at least 500 years
- Addressed source control at only a selected list of Mine and Mill sites and floodplain locations that were not well defined
- Did not address:
 - Impacts of groundwater throughout the Upper Basin
 - Ecosystem recovery of Canyon Creek drainage
 - Ground water and surface water loading from the box
 - Implementation plan or schedule

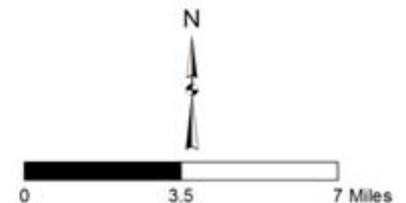
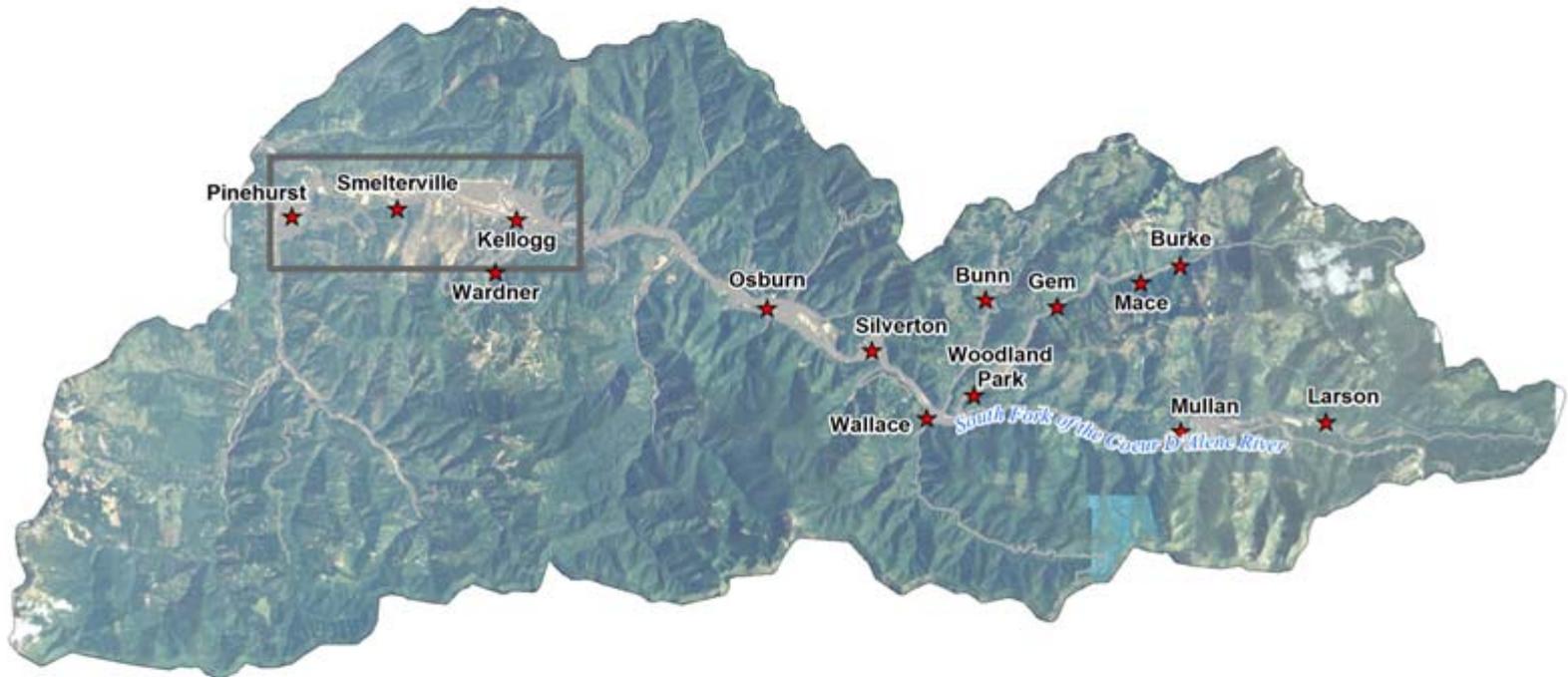
Why Develop New Decision Document?

- Present a comprehensive cleanup plan for the Upper Basin that reflects improved knowledge of the Box and Upper Basin and addresses National Academy of Sciences' recommendations
- Address actions in the Box cleanup needed to address groundwater and impaired surface water quality
- Actions to protect remedies from tributary flooding and heavy precipitation

Cleanup Plan Change Process

- Feasibility Study – evaluation of cleanup alternatives
- Proposed Plan - draft cleanup plan
 - Public comment period
 - Public meeting
- Record of Decision Amendment – final revised cleanup plan

Area of coverage for Upper Basin ROD Amendment



Cleanup Plan Structure

➤ Remedial Actions

- Additional source areas identified in previous FS
- OU2 Phase II actions to address water quality
- Updated Woodland Park actions based on treatability studies and modeling
- Change in water treatment strategy – focus on groundwater collection/treatment rather than surface water treatment

➤ Remedy protection from tributary flooding and heavy precipitation

➤ *Lower Basin...*

- *Not selecting additional cleanups at this time*
- *Process underway to better understand movement of contaminated sediment*

Remedial Action Goals/Benefits

- Comprehensive remedy for Upper Basin that includes all actions that may be needed to meet water quality standards
- Final remedy for Upper Basin surface water through cleanup and natural recovery to meet surface water standards

RA Goals/Benefits (cont.)

- Groundwater – *secondary benefit*
 - Reduce contribution of contaminated groundwater to surface water
 - Reduce groundwater metals levels
- Additional benefits:
 - Reduce particulate lead in river and recontamination potential in Lower Basin
 - Reduce risk from contaminated mine waste to humans and wildlife
 - Protect remedies from recontamination and scouring

Remedy Protection Objectives

- Protect human health and environment
 - Keep clean areas clean
 - Manage overland water flow from flooding and rain events
 - Minimize erosion of clean barriers and deposition of contaminated sediment
- Minimize future maintenance to the extent practical

Remedy Protection Scope

➤ Includes:

- Kingston to Mullan (Box & Upper Basin)
- Tributaries to South Fork and drainages
- Storm water management actions

➤ Does not include:

- South Fork and Pine Creek flooding
- Sanitary sewer lines
- Roads (addressed by current RODs)

National Remedy Review Board

- Internal EPA technical and policy review
- High cost cleanups (\$25M+)
- Helps to evaluate if proposed remedies are consistent with law, regulations, policy
- Product is recommendation memo – EPA is final decision-maker

Implementation Plan

- Prioritized plan for cleanup
 - Identify the first increment in a multi-year implementation package
 - Identify candidates for the 2nd multi-year work package for which characterization and design data will be gathered in parallel with the first increment of work
- Coordinating with Trustee restoration activities and local development projects
- Will adapt cleanup to what is learned from site data, remedial action implementation and other information

Community Engagement

- 10+ technical meetings with Upper Basin PFT
- Sharing draft FS with Upper Basin PFT
- Updates at TLG, CCC and Commission meetings
- Discussions with Mayors and Shoshone County Commissioners about remedy protection
- Meeting with community groups (e.g., SNRC, Kootenai Environmental Alliance, CDA Chamber/Nat. Resources, Audubon Society, etc.)
- ROD Amendment focused web page

Topics Addressed in Recent Upper Basin PFT meetings

- OU2 and Woodland Park groundwater modeling and cost effectiveness results
 - Permeable reactive barrier evaluation
 - Conceptual evaluation of sediment traps
 - Eco-prioritization tool and remedial action “bucketing” for implementation plan
 - Human health remedy protection update
- 

Community Engagement (cont.)

➤ Proposed Plan:

- Opportunity to review and comment on draft cleanup plan
- Open House and Public Meeting
- Proposed Plan focus at May BEIPC meeting
- Share information at meetings with key stakeholders

U.S. ENVIRONMENTAL PROTECTION AGENCY

Region 10 Cleanup: Bunker Hill Mining & Metallurgical

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ROD Amendment for Upper Basin and Box

On this page:

- [Background](#)
- [Fact Sheets](#)
- [Meetings](#)
- [Technical Memos](#)
- [Draft Documents](#)
- [Decision Documents](#)
- [Contact Us](#)

NEW - Executive Summary for the Draft Focused Feasibility Study (PDF) (22pp, 286K). Full copies of the Draft FFS are available on CD at [select local libraries](#) or by contacting the staff listed below.

Background

EPA will set priorities for ecological cleanup work in the Upper Basin and Box. Planning is happening to update some EPA cleanup decisions.

The Upper Basin includes the South Fork of the Coeur d'Alene River and its tributaries downstream to where they flow into the North Fork. The Box is the 21-square-mile area around the old Bunker Hill smelter where EPA began its cleanup activities in the early 1980s.

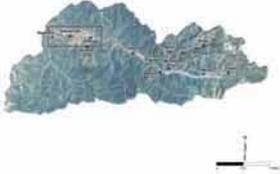
The goal of this new effort is to set out a comprehensive, holistic cleanup approach across the Basin to improve water quality. EPA will select more cleanup actions for the Upper Basin and Box, and prepare an amendment to the Record of Decision (ROD). A ROD amendment is a change to the current Record of Decision that guides overall cleanup in the Basin. Under the Superfund law, EPA is responsible for modifying the ROD. A Proposed Plan will be provided for public comment. EPA hopes to complete the ROD amendment by 2010.

Click on the triangle ▶ to expand or collapse a heading below and see more documents.

- ▶ **Fact Sheets**
- ▶ **Meetings**



Cleanup underway at Golconda Mine and Mill site.



Site overview map.
(click map for larger view)

You will need Adobe Reader to view some of the files on this page. See [EPA's PDF page](#) to learn more.

Region 10 Homepage
Region 10 Cleanup
Bunker Hill Mining & Metallurgical
What You Can Do
Information Sources
Fact Sheets
In The News
Maps & Photos
Documents
Partners
Related Links
Cleanup Work
Box
Basin
Spokane River
Completed
Freedom of Information Act (FOIA)

Done Local Intranet 100%

start Anne Dailey - Inbox ... Palm Desktop C:\Documents and S... Microsoft PowerPoint ROD Amendment for ... 1:30 PM

<http://yosemite.epa.gov/R10/CLEANUP.NSF/sites/bh+rod+amendment>

Project Schedule

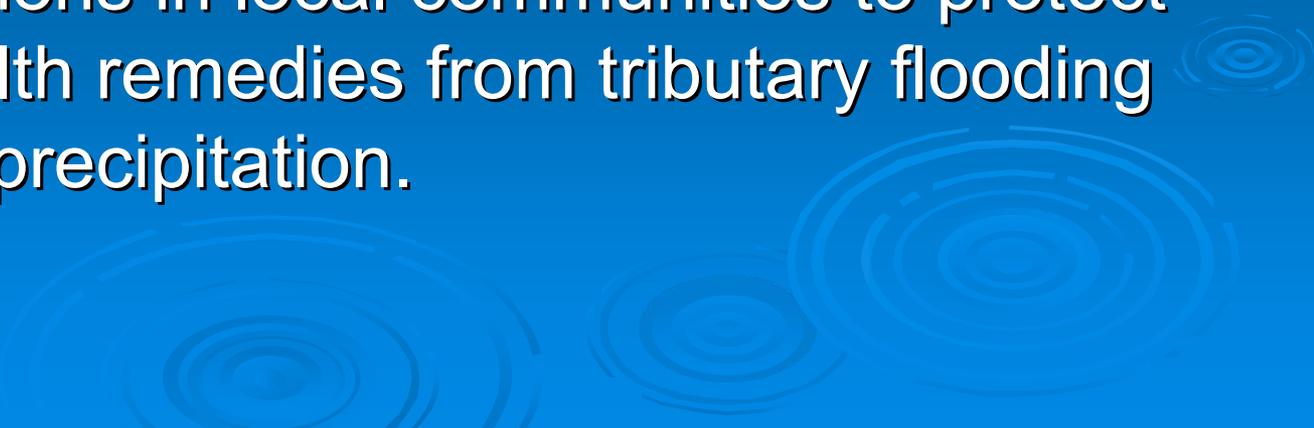
- Ongoing...
 - Upper Basin PFT technical meetings
 - Updates at TLG, CCC and Basin Commission meetings
- Continuing development of feasibility study
- **Draft Focused Feasibility Study review by Upper Basin PFT and others**
 - **Early Feb. 2010**
 - **Comments due to EPA Feb. 19, 2010**

Project Schedule (cont.)

- EPA National Remedy Review Board –
 - Late April 2010
- Summer 2010 – Proposed Plan comment period and public hearing
- Fall 2010 – Issue ROD Amendment

***Additional technical meetings will be scheduled*

Take Home Messages

- Draft Focused Feasibility Study available for review
 - Upper Basin ROD Amendment is required to:
 - Provide a comprehensive list of actions that may be needed to meet surface water quality standards and
 - Provide actions in local communities to protect human health remedies from tributary flooding and heavy precipitation.
- 

Take Home Messages (cont.)

- Separate Implementation Plan to identify and select most important and cost effective actions to achieve water quality standards soonest.
- ROD Amendment development occurring with within Basin Commission framework and with additional community involvement opportunities

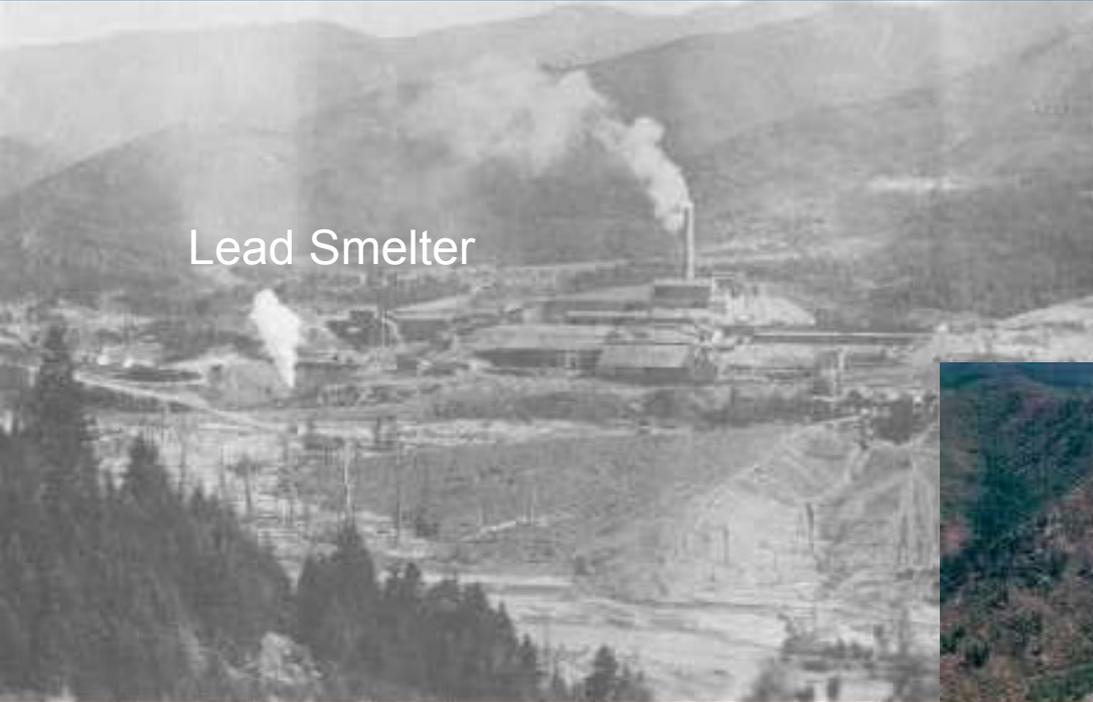
Overview and Discussion of Draft Focused Feasibility Study



Section 1 - Introduction



Section 2 – Site Background



Lead Smelter



Existing Records of Decision

➤ Bunker Hill RODs

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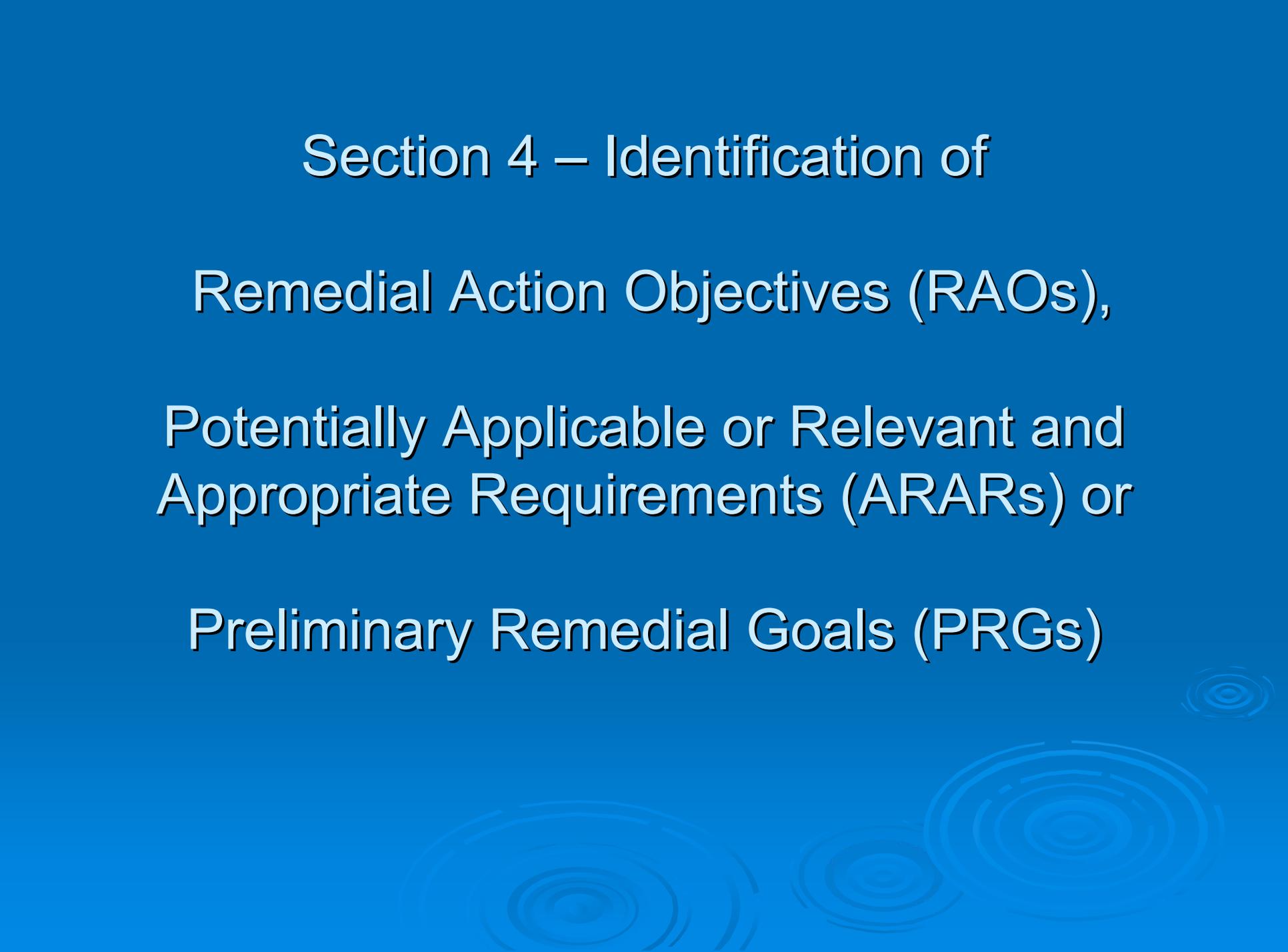
➤ Elements of OU3 Interim ROD

- Basin Residential and Recreational Areas Cleanup
- Selected excavation, containment, disposal in Upper Basin
- Surface water treatment (in Canyon Creek) to address dissolved metals
- Capping and excavation in selected floodplain and banks in the Lower Basin

Site 3 – Site Environmental Conditions



Section 4 – Identification of
Remedial Action Objectives (RAOs),
Potentially Applicable or Relevant and
Appropriate Requirements (ARARs) or
Preliminary Remedial Goals (PRGs)

The background of the slide is a solid blue color. In the lower right quadrant, there are several faint, concentric circles that resemble ripples in water, creating a decorative pattern.

- RAOs - general description of what cleanup is expected to accomplish and provide basis for evaluating cleanup alternatives
- ARARs - cleanup standards, requirements
 - Applicable – environmental standards (WQS)
 - Relevant and Appropriate
- PRGs - standards by which cleanup may be measured

Section 5 – Typical Conceptual Designs (TCDs)

- Building blocks for assembling remedies
- Used to develop alternatives and cost estimates
- Does not limit use of technology or process options
- Used this approach given complexity of site
- TCDs from 2001 FS carried forward

Section 5 (cont.)

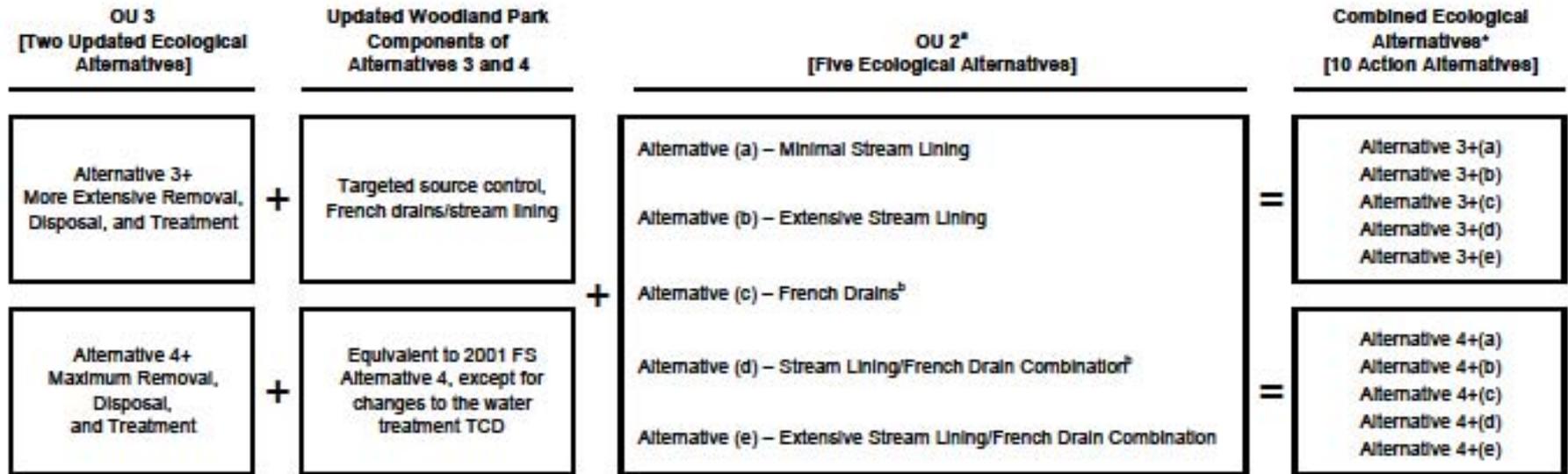
➤ NEW TCDs added:

- Considered “green remediation” opportunities
- Water collection/conveyance/management (slurry walls, stream lining, French drains, extraction wells, diversions, pump stations)
- Water treatment
 - None of 2001 TCDs carried forward
 - New TCDs developed as result of studies completed in Canyon Creek
 - Treatment at CTP
 - On-site passive lime treatment
 - On-site semi-passive sulfate-reducing bacteria (SRB)
 - In-situ semi-passive SRB

Section 6 – Development of Remedial Alternatives

- Build upon 2001 FS Ecological protective of human health and environment
 - **Alternative 3** (More extensive removal, disposal and treatment)
 - **Alternative 4** (Maximum removal, disposal and treatment)
- Include additional mine/mill sites, OU2 Phase II, updated water treatment strategy

Summary of Remedial Alternative Structure*



[†] The five OU 2 alternatives are combined with each of the two OU 3 alternatives to form 10 action alternatives. Together with the No Action Alternative, a total of 11 ecological alternatives are evaluated in this FFS Report.

FS - Feasibility Study
OU - Operable Unit
TCD - typical conceptual design

^a All the OU 2 alternatives also include the same set of actions for the Reed and Russell Tunnel adit flows: installation of a check dam to reduce or eliminate the flow of contaminated water, with a contingency plan for collection and treatment of discharge water if needed.

^b A limestone permeable reactive barrier (PRB) was evaluated as a potential option in place of a portion of the French drain in these alternatives (as discussed in Section 6.3 and Appendix F). However, based on the results of this evaluation, the PRB option has not been retained for direct inclusion in the alternatives. Additional study would be needed to further evaluate the potential effectiveness and cost of the PRB option.

* NOTE – *Remedy protection actions are not covered in this figure*

Figure 6-1
Schematic Illustration of the Ecological Alternatives
Focused Feasibility Study
Upper Basin of the Coeur d'Alene River
BUNKER HILL SUPERFUND SITE

Section 7 – Description of Alternatives

- Excavation and Disposal
- Hydraulic Isolation
- Capping, Regrading, and Revegetating
- Collection and Treatment of Adit Discharge, Seeps, and Groundwater
- Stream and Riparian Improvements
- Upgrade and Expansion of the CTP

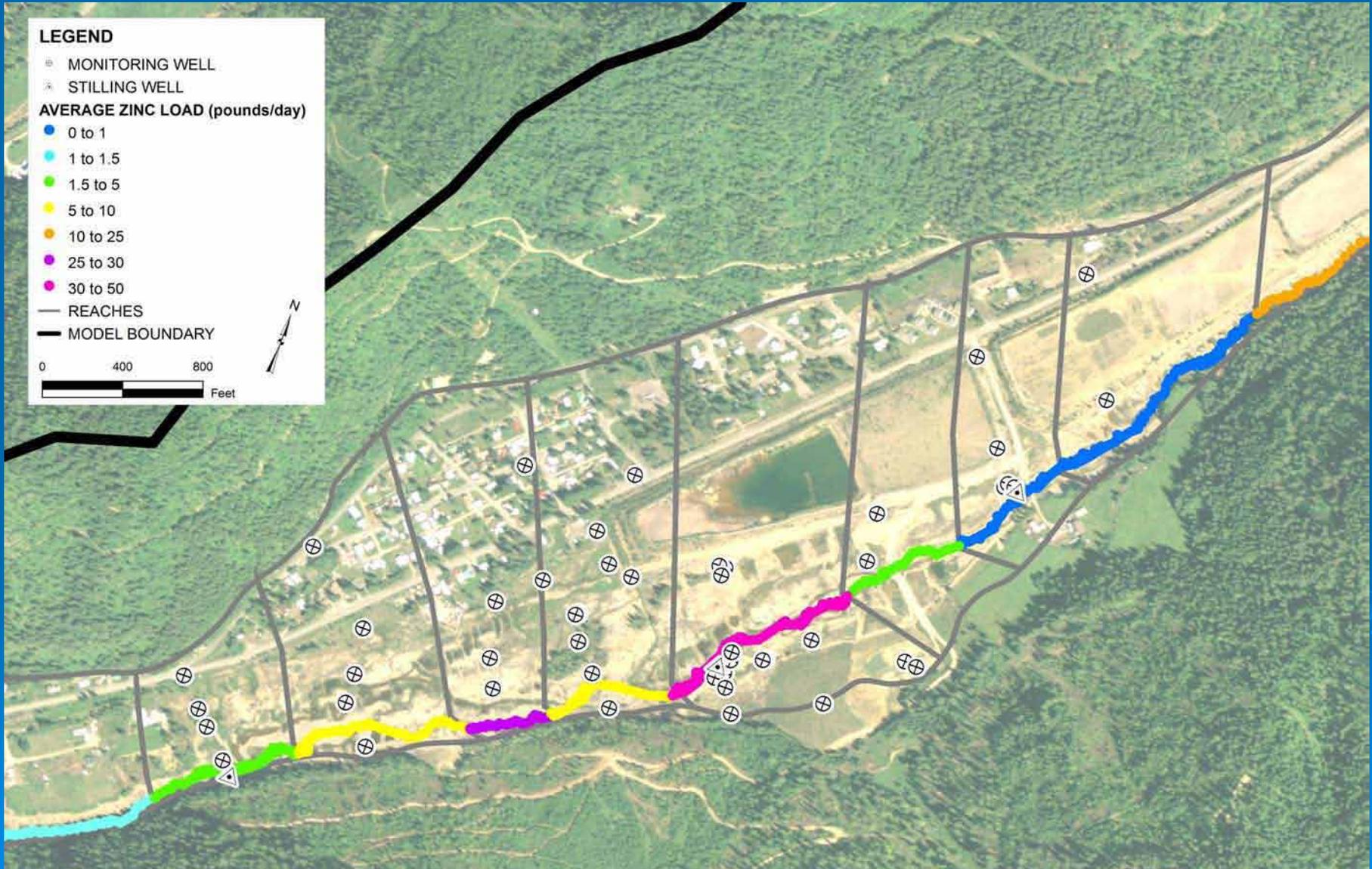
Excavation, regrading and capping

- Alt 3+ and Alt 4+ include actions at ~ 300 mine and mill sites
- Work similar to what has been done at Constitution, Golconda, & Rex
- Primarily consolidation of wastes on site and capping to prevent erosion and leaching of metals



Hydraulic Isolation

Estimated Zinc Loading to Canyon Creek



Collection of adits, seeps, and groundwater Water Treatment Technology Evaluation as part of Woodland Park work

➤ Active Treatment

- ✓ Bench Treatability Studies on GW and SW
- ✓ Pilot Studies – HDS, Acti-flow
- ✓ Conceptual Design Lime Pond System
- ✓ Hydrologic Investigation
- ✓ GW Modeling
- Assembly & Evaluation of Treatment Options

➤ Passive Treatment

- ✓ Literature & Input from Experts
- ✓ Info from Success, BLM, and Nevada Stewart pilots
- ✓ SRB & Reactive Media Bench and/or Pilot Studies
- ✓ MSE Passive Media Evaluation

Woodland Park Alternative

- Stream Lining in portion of Canyon Creek near Woodland Park
- French drains for groundwater collection
- Targeted source control actions



Central Treatment Plant Upgrades

- Expansion of CTP from 5,000 gpm up to 33,000 gpm depending on alternative
- 2 Phases
- Adds greater efficiency and improves discharge



Section 7 (cont.)

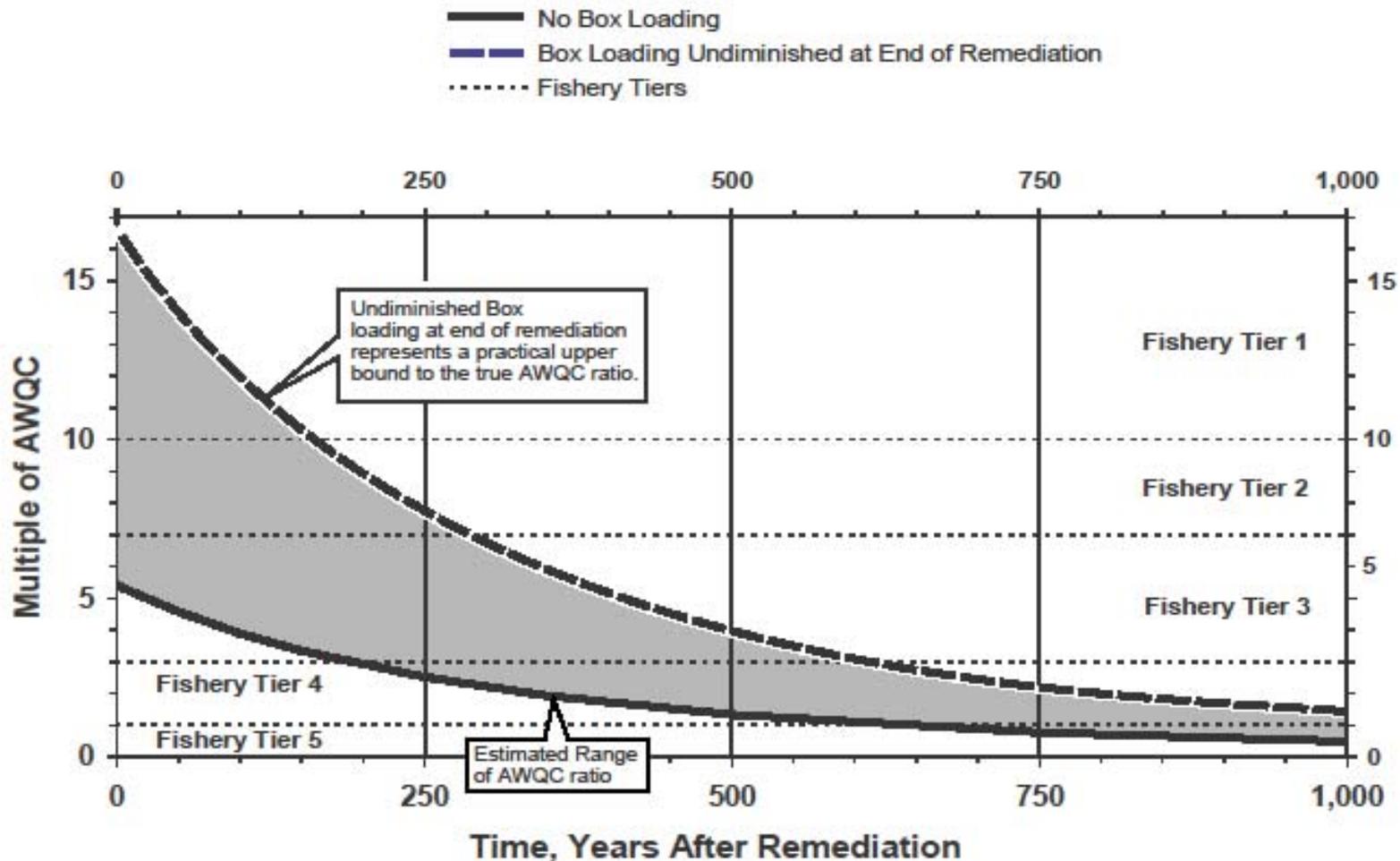
Evaluation and Comparison of Alternatives

- **Threshold Criteria**
 - Overall Protection of Human Health and the environment
 - Compliance with ARARs
- **Primary Balancing Criteria**
 - Long-term effectiveness and permanence
 - Reduction of toxicity, mobility, or volume through treatment
 - Short-term effectiveness
 - Implementability
 - Cost of Implementation
- **Modifying Criteria**
 - State acceptance
 - Community acceptance

Remedial Action Effectiveness – Sec 7 (cont.)

- Previous predictive analysis conducted as part of OU3 Interim ROD
- Updated analysis to include:
 - include recent data
 - change in site specific water quality standard
 - current water quality conditions
 - integrate load estimates from models
 - update to source depletion decay factor

Zinc Reduction Predicted in OU3 Interim ROD



Zinc Reduction Predicted in Draft Upper Basin Focused Feasibility Study

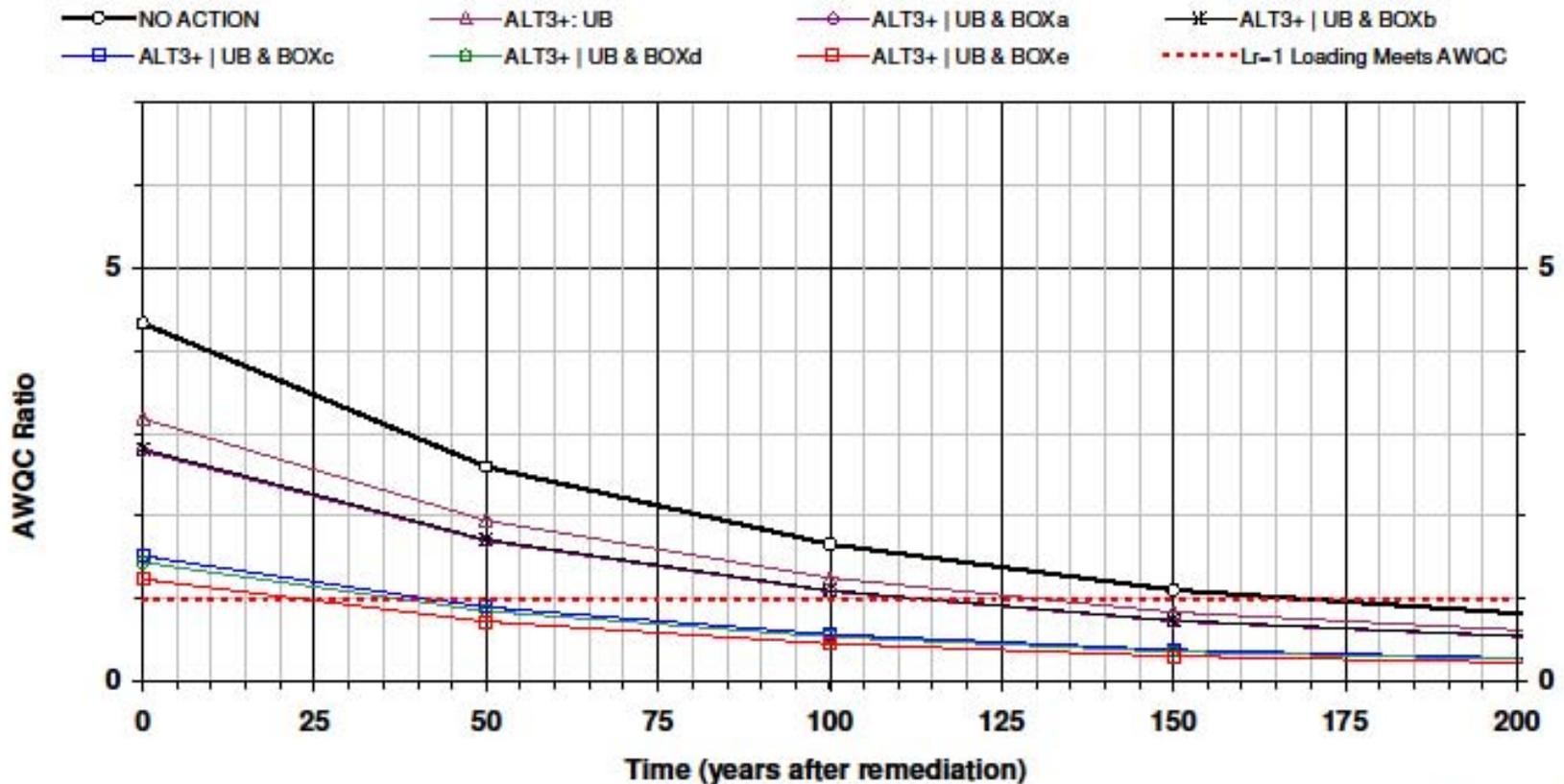


Figure 8-3
Predicted Decline in AWQC Ratio
for Pinehurst, Alternatives 3+(a) through 3+(e)
Focused Feasibility Study
Upper Basin of the Coeur d'Alene River
BUNKER HILL SUPERFUND SITE

Section 8 – Comparative Analysis of Alternatives

- Identify the relative advantages and disadvantages of remedial alternatives in terms of threshold and primary balancing criteria. (Section 7 looked at each alternative independently without consideration of other alternative)

The content of this figure has not undergone a senior quality control check and may be revised based on senior review.

Cost versus Time Comparison of Alternatives Section 8 (cont)

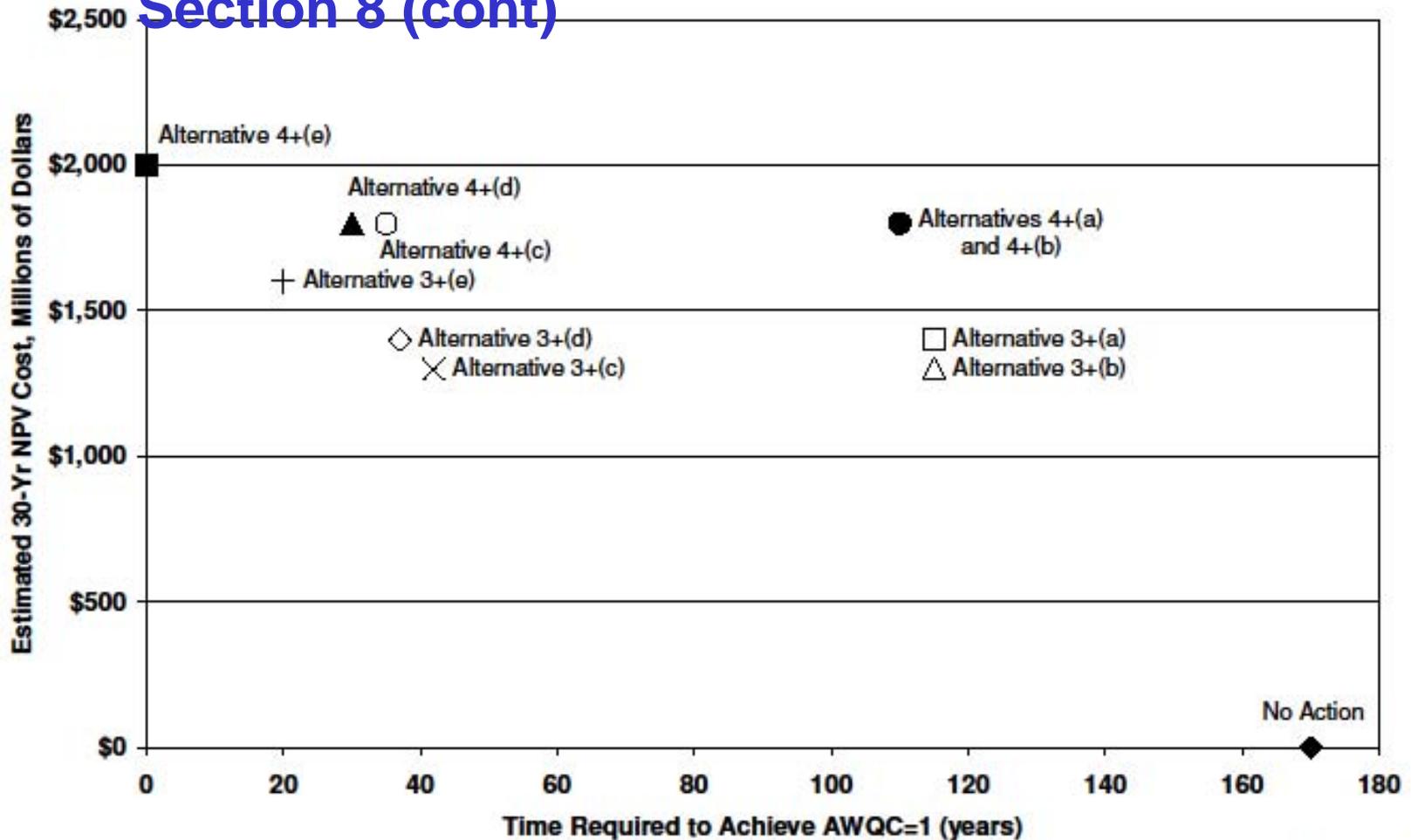


Figure 8-5
Total NPV Costs Versus Times to
Achieve Surface Water ARARs
Focused Feasibility Study
Upper Basin of the Coeur d'Alene River
BUNKER HILL SUPERFUND SITE

Section 9 – Remedy Protection

