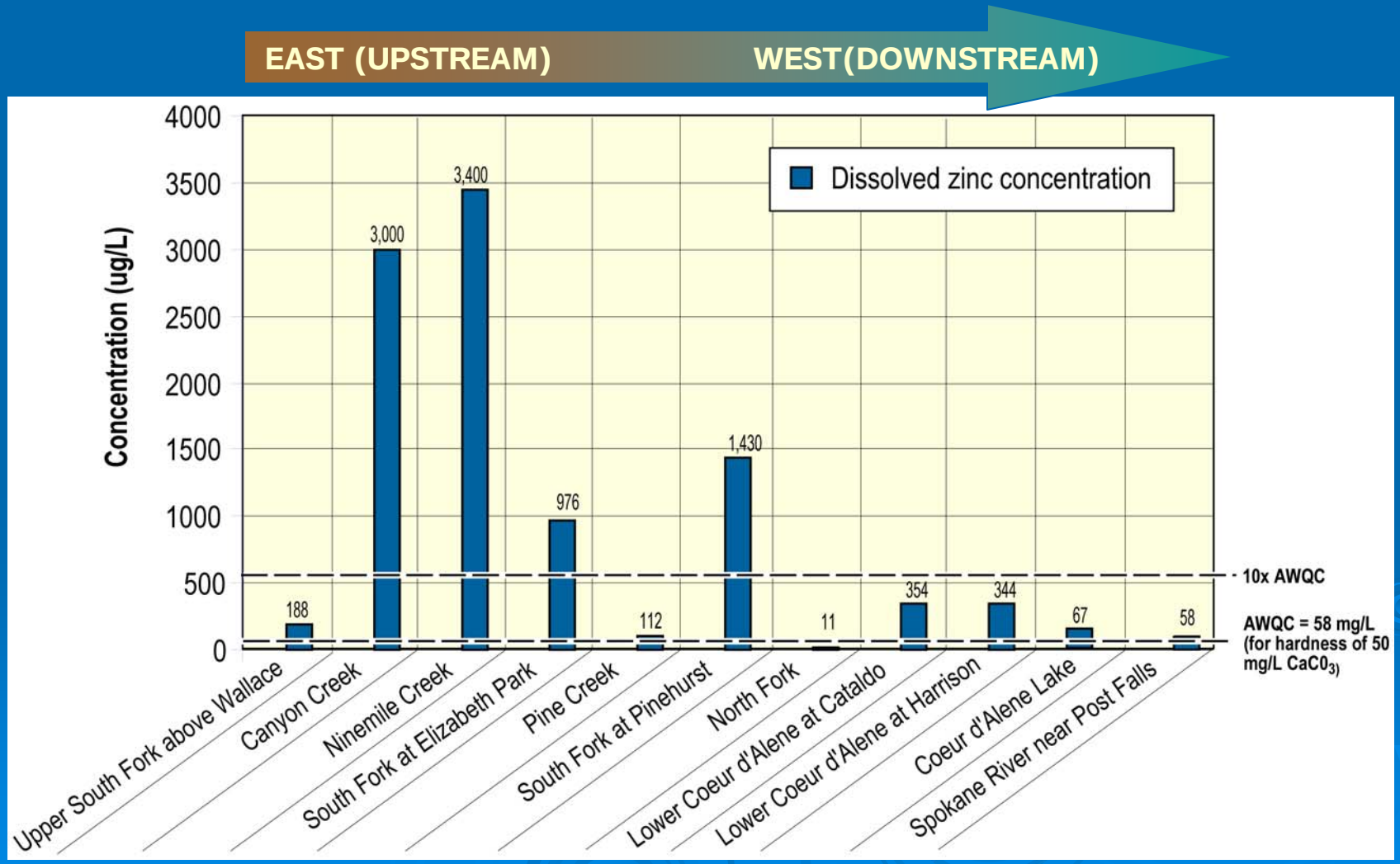
Overview of Upper Coeur d'Alene Basin Focused Feasibility Study

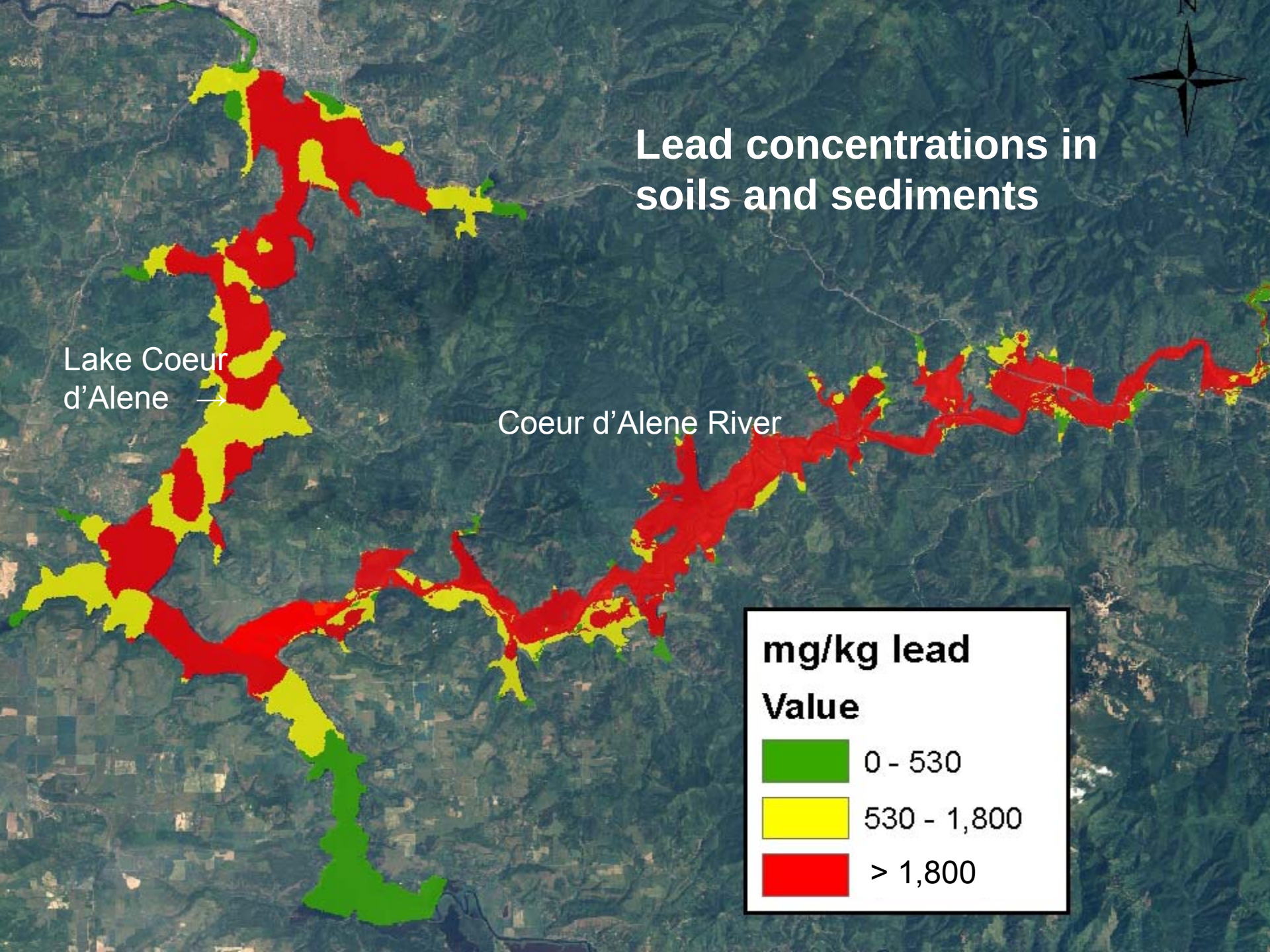
February 2010

Topics

- Quick Site Background Information
- Why develop a new cleanup plan?
- Draft Focused Feasibility Study
  - Remedial Actions
  - Remedy Protection
- Implementation Plan
- Schedule
- Take home messages

Zinc Exceedances Over Water Quality Criteria




Lead concentrations in soils and sediments
Lake Coeur d'Alene →
Coeur d'Alene River
mg/kg lead
Value
0 - 530
530 - 1,800
> 1,800

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 areas in the Upper Basin of excavation, containment & disposal
  - Surface water treatment (in Canyon Creek) to address dissolved metals
  - Excavation and capping in selected floodplain and banks in the Lower Basin

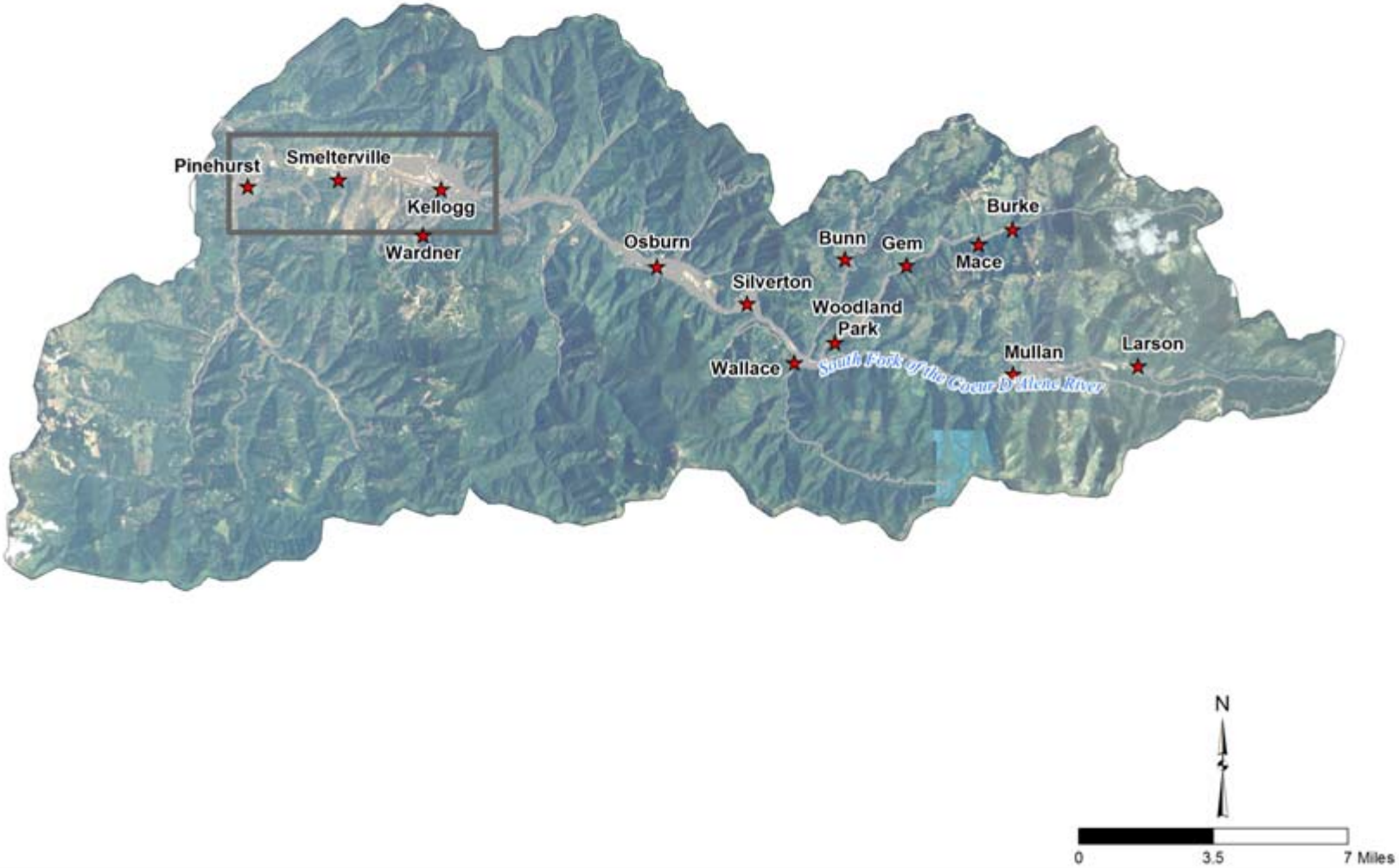
OU3 Interim ROD

- 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 Cleanup Plan?

- 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
- Provides path to meet water quality standards
- Actions to protect remedies from tributary flooding and heavy precipitation
- Human health remains top priority!!

Area of coverage for Upper Basin ROD Amendment



Cleanup Plan Structure

- **Remedial Actions**
  - Additional source areas not identified in OU3 Interim ROD
  - OU2 Phase II actions to address water quality
  - Updated Woodland Park actions
  - 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 protect human health and 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 benefits*
  - 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

Development of Remedial Alternatives

- Built upon 2001 Feasibility Study Ecological Alternatives protective of human health and the environment
  - **Alternative 3** (More extensive removal, disposal and treatment)
  - **Alternative 4** (Maximum removal, disposal and treatment)

Development of Remedial Alternatives (cont.)

- Includes:
  - Additional mine/mill sites and contaminated floodplain tailings
  - Updated Woodland Park based on treatability studies and modeling
  - OU2 Phase II actions to address groundwater and surface water quality
  - Emphasis on treatment/collection of groundwater from Upper Basin and Box at Central Treatment Plant

From OU3 FS

Alternative 3

Alternative 4

+

UPDATED Woodland Park Alternative

+

Five OU2 Phase II RA Alternatives

=

*Combined Remedial Alternatives***

UPPER BASIN ALTERNATIVE 3+

UPPER BASIN ALTERNATIVE 4+

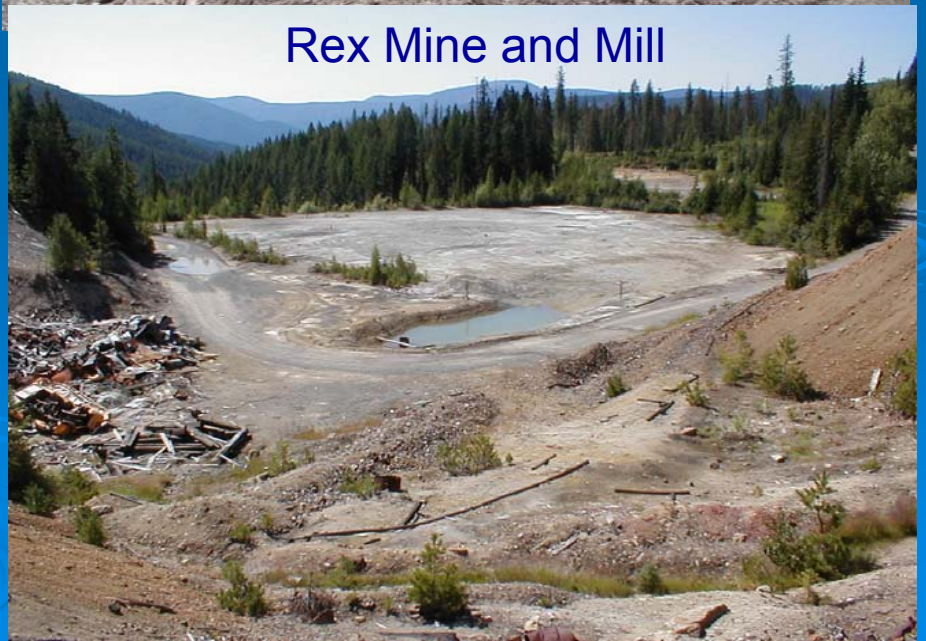
***Does not include remedy protection*

Description of Remedial Alternatives

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

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



Central Treatment Plant Upgrades

- Expansion of CTP from 5,000 gpm up to 33,000 gpm depending on alternative
- Discharge pipeline to South Fork
- Expansion conducted in phases as source areas tied in.
- Provides greatest efficiency for treatment of all waters within existing plant area

Comparative Analysis of Alternatives

- Rationale for selection of Preferred Alternative
- Identify the relative advantages and disadvantages of remedial alternatives in terms of threshold and primary balancing criteria

Evaluation & 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

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

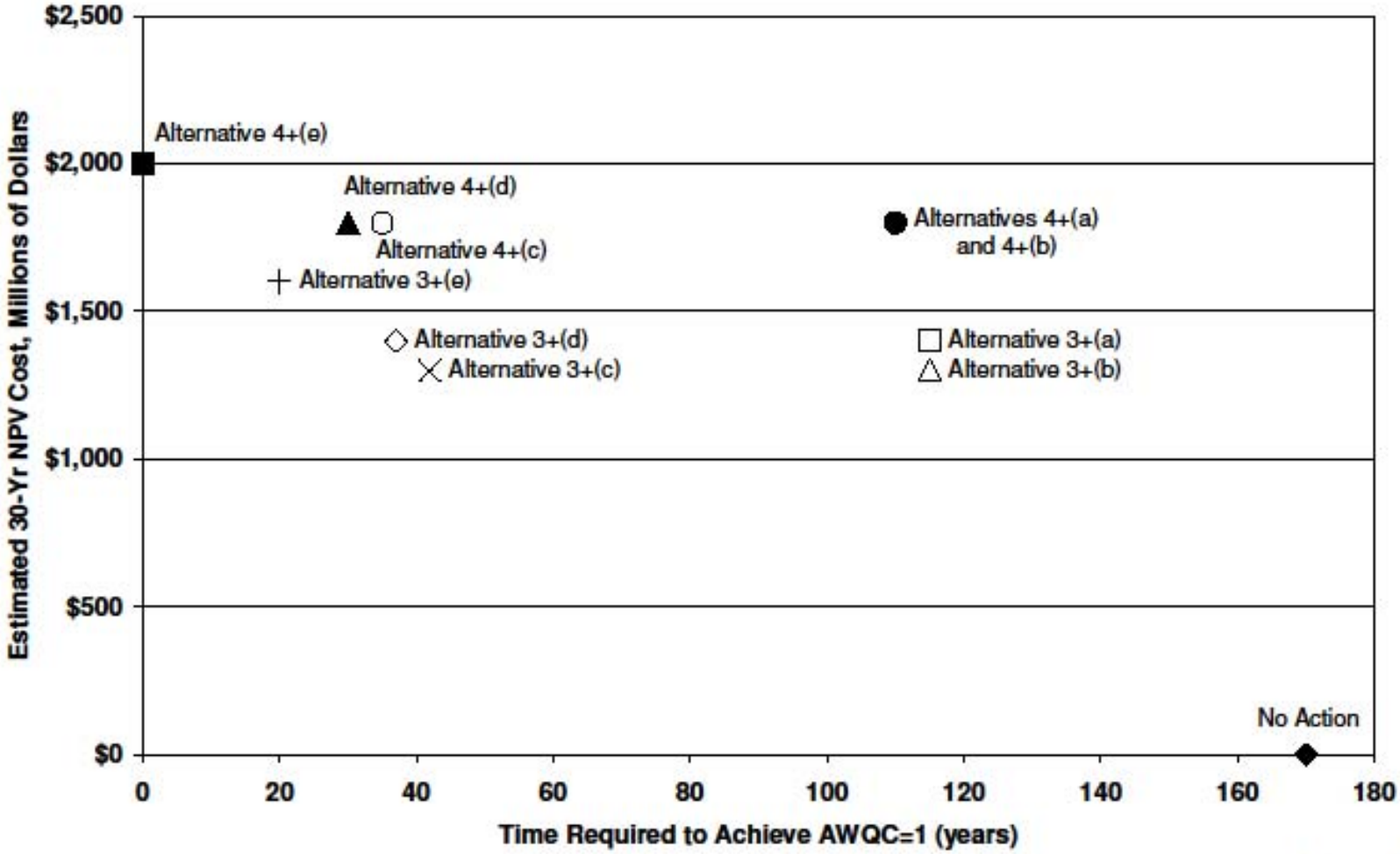


Figure 8-5
Total NPV Costs Versus Times to Achieve Surface Water ARARs
Focused Feasibility Study
Upper Basin of the Coeur d'Alene River
BUNKER HILL SUPERFUND SITE

Remedial Action Alternatives -- Estimated Costs and Timeframe

- Depending on the alternative selected and funding level...
  - Cost ranges from $1.2 Billion to $2.1 Billion
  - Timeframe for implementation ranges from 40 years to 120 years

Remedy Protection Alternatives

Remedy Protection Objectives

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

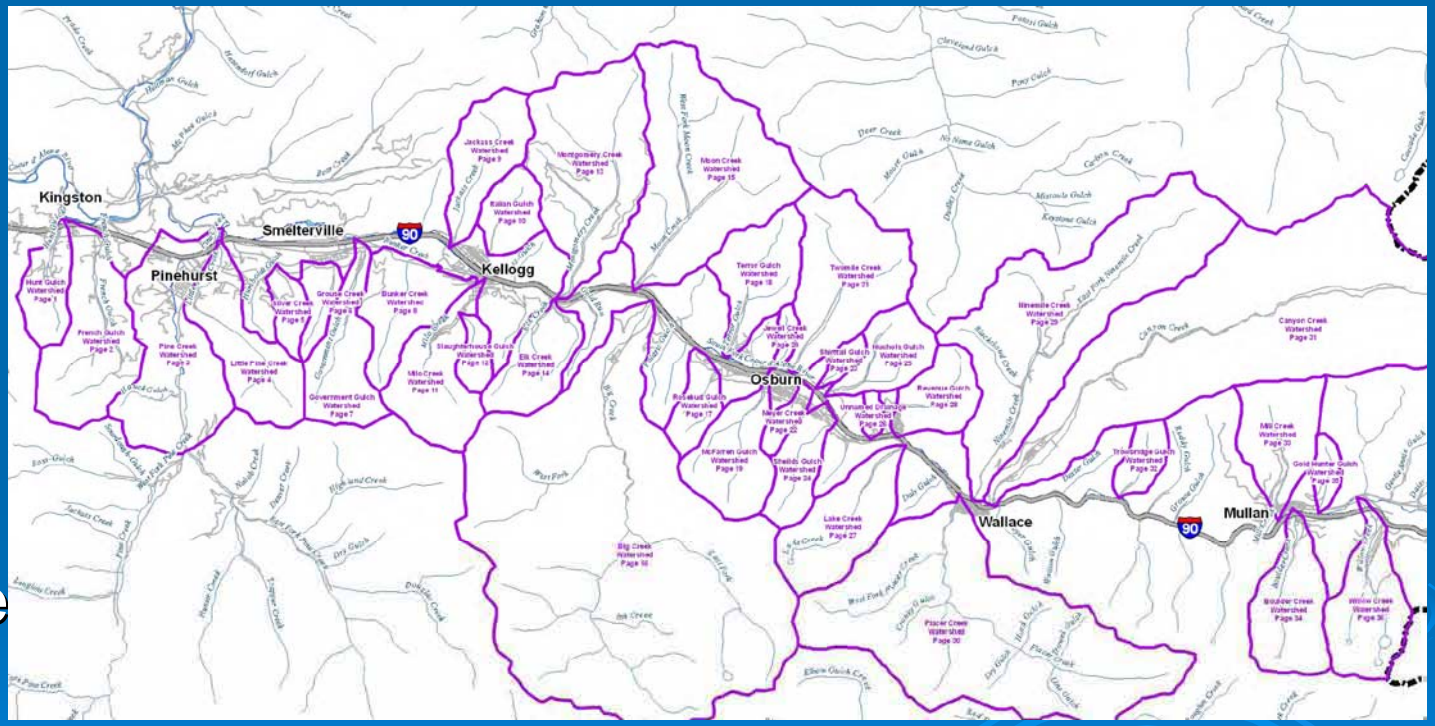
Remedy Protection Scope

- Includes:
  - Kingston to Mullan (Box & Upper Basin)
  - Tributaries to South Fork and drainages
  - EPA and DEQ looking for ways to jointly implement with others
- Does not include:
  - South Fork & Pine Creek actions to solely control flooding
  - Roads (addressed by current RODs)

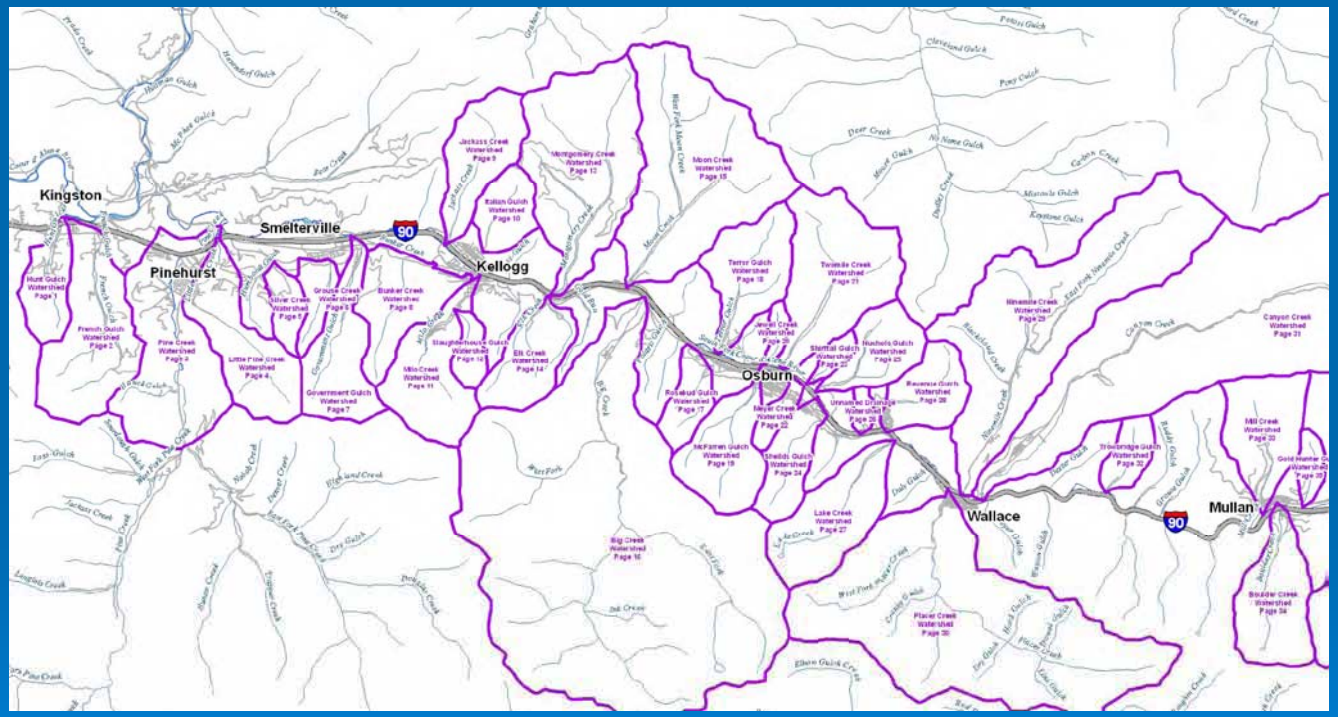
Target Areas

Communities

- Mullan
- Wallace
- Silverton
- Osburn
- Kellogg
- Wardner
- Smelterville
- Pinehurst



Target Areas - continued



Side Gulches

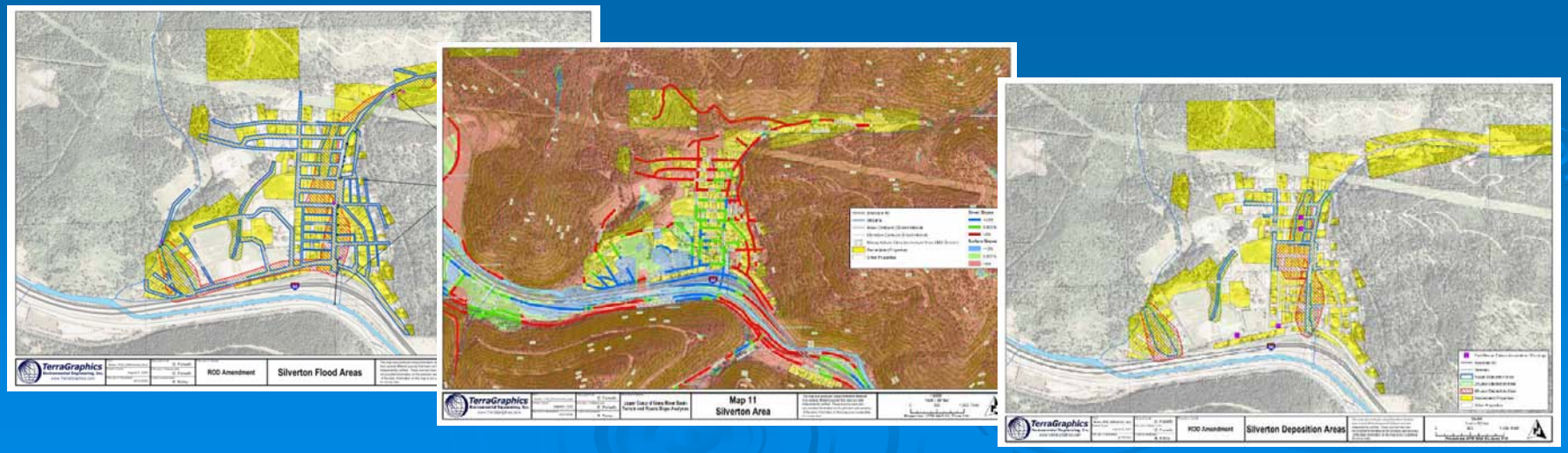
- Big Creek
- Willow Creek
- Elk Creek
- Moon Creek
- Montgomery Creek
- Shirttail Gulch
- Nuckols Gulch
- Silver Creek
- Slaughterhouse Gulch
- Terror Gulch
- Two-mile Creek
- Ninemile Creek
- Canyon Creek
- Government Gulch
- Humboldt Gulch
- Bunker Creek
- Hunt Gulch
- French Gulch

Risk Characterization

- Impact Maps
  - Flood
  - Scour
  - Deposition

Remediated Area At Risk

Unremediated Area At Risk



Remedy-at-risk summary

At-Risk*	Design Storm
7%	5-year
16%	25-year
25%	50-year

*Within the 8 communities analyzed

The Alternatives

- Alternative RP1 “No Further Action”
  - No modifications to existing infrastructure
  - Relies on
    - Post-Event Response
    - Existing systems

The Alternatives (…cont)

- Alternative RP2 “Modifications to Selected Remedies to Enhance Protectiveness”
  - Modifies existing drainage controls
  - Relies on
    - Remedy Protection Projects
    - 50-year design storm protection
    - Evaluated risks for 100-year storm

Remedy Protection Projects Overview

- 14 Potential Remedy Protection Projects Within the Communities
- Typical Project Elements
  - Increase Channel Capacity
  - Replace and Upsize Culverts
  - Replace and Increase Clear Span at Bridges
  - Stabilize Road-Shoulders
- Mine & Mill Sites Addressed by Current RODs or Source Control Portions of FFS.

Estimated Remedy Protection Costs

	Total Costs* (30-yr NPV)	
	Alternative RP-1 No Further Action	Alternative RP-2 Remedy Protection Projects
8 Communities	**$33,800,000**	**$18,800,000**
Side Gulches	TBD	$17,300,000
TOTAL	TBD	$36,100,000

*Capital and O&M costs

Remedy Protection Next Steps

Prioritize remedy protection projects

- Develop criteria with input from local representatives
- Implementation Plan

Analyze side gulches

- Define risk to clean barriers
- Develop remedy protection projects from list of options in FFS

Establish O&M procedures

- With local representatives
- Joint State, County, municipality approach

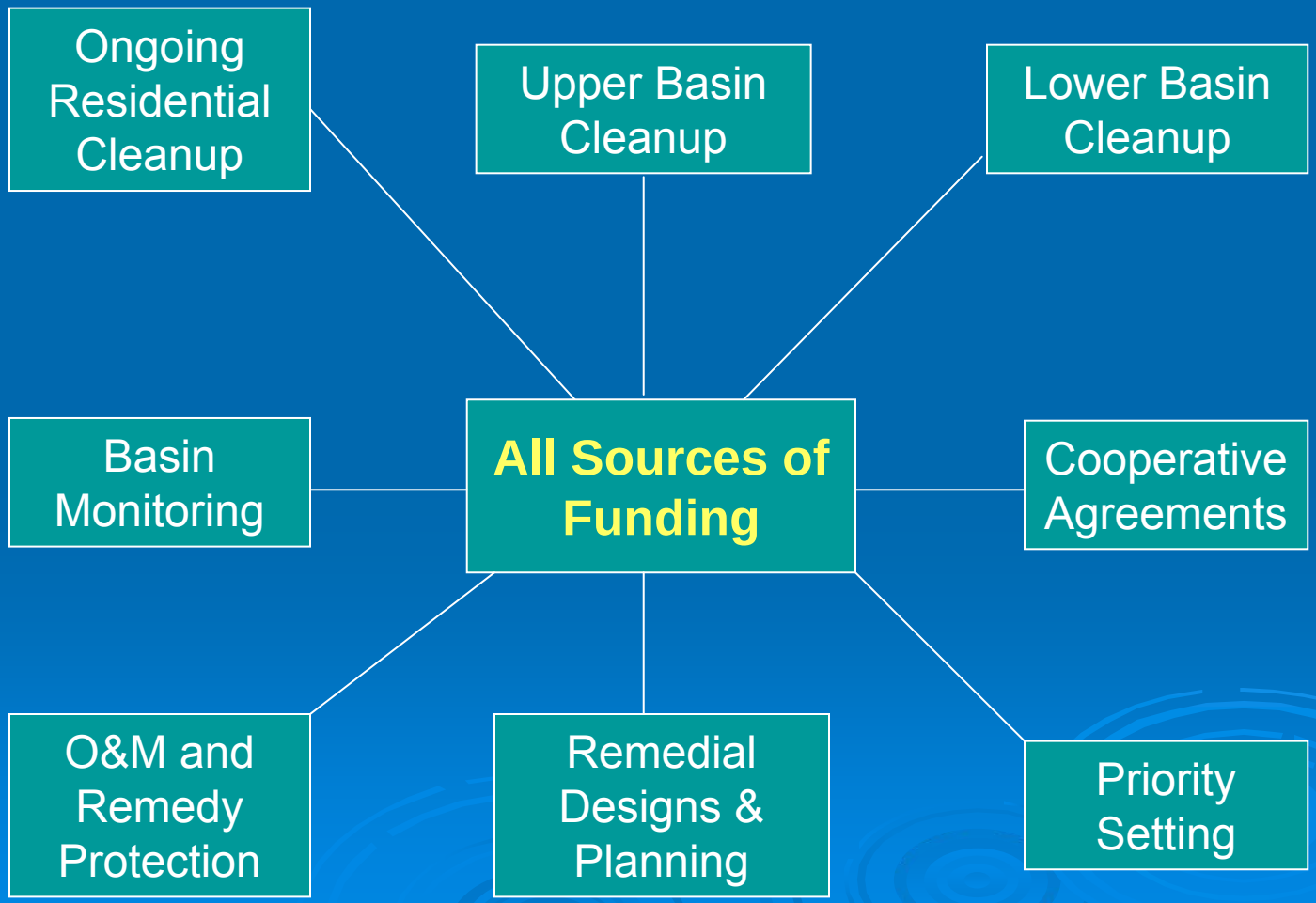
National Remedy Review Board

- 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

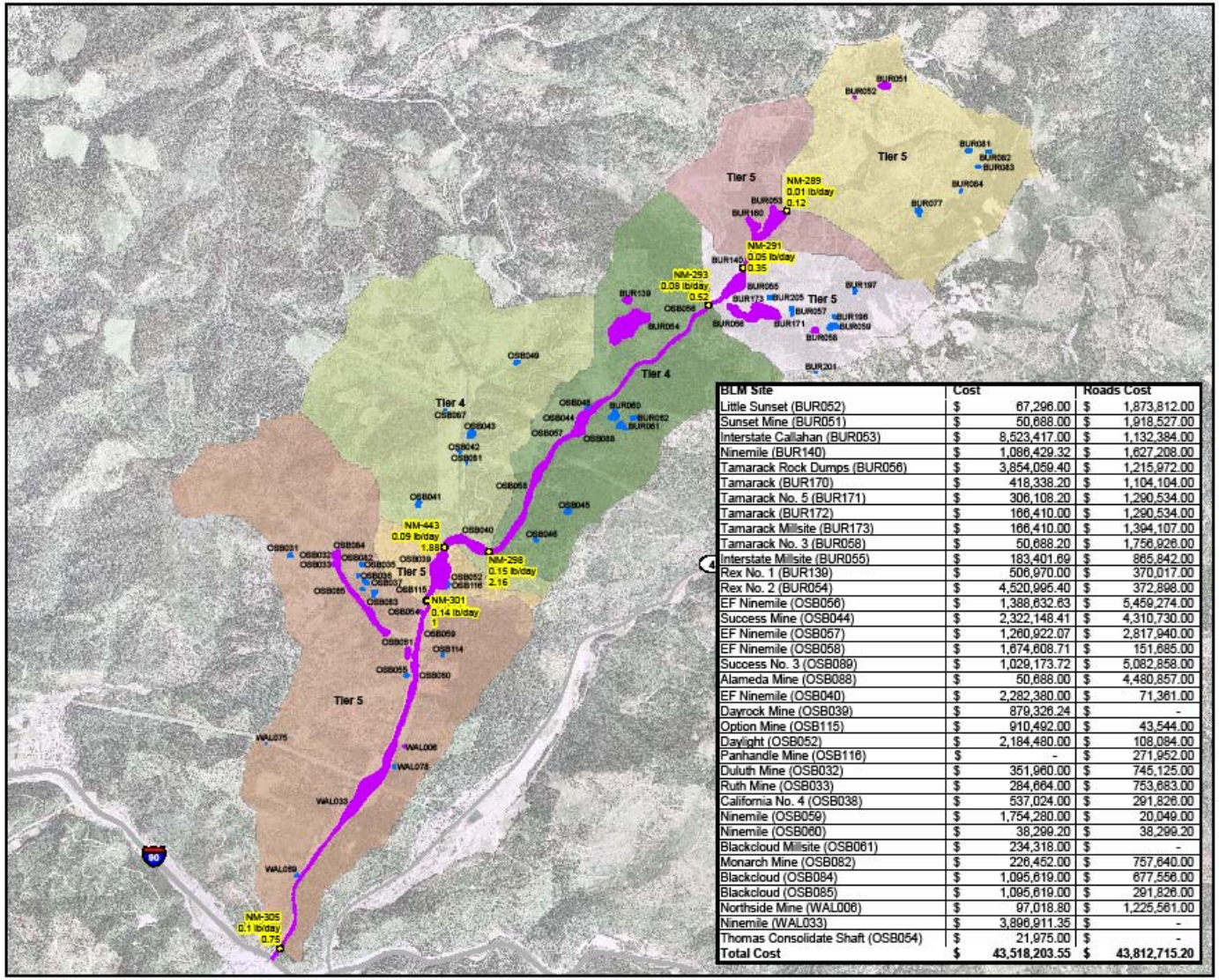
- Separate from ROD Amendment
- Helps set priorities for a large amount of work where funding is not unlimited
- Helps take into consideration a variety of factors that influence what should be done first

Bunker Hill Site Project Spending Examples

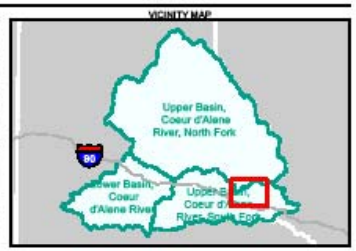


Priority Setting Needed for Large Number of Sites

- Why so Many Sites?
  - Large geographic area with hundreds of known and potential sources
  - Work will be required at a large number of sites to address the problem
  - Funding could be spent on investigating source areas in order to eliminate from list or spent on starting work on sites where cleanup will be required
  - Comprehensive list of all potential sites provides flexibility in implementation and avoids future ROD Amendments to add additional sites



BLM Site	Cost	Roads Cost
Little Sunset (BUR052)	$ 67,296.00	$ 1,873,812.00
Sunset Mine (BUR051)	$ 50,688.00	$ 1,918,527.00
Interstate Callahan (BUR053)	$ 8,523,417.00	$ 1,132,384.00
Ninemile (BUR140)	$ 1,086,429.32	$ 1,627,208.00
Tamarack Rock Dumps (BUR056)	$ 3,854,059.40	$ 1,215,972.00
Tamarack (BUR170)	$ 418,338.20	$ 1,104,104.00
Tamarack No. 5 (BUR171)	$ 306,108.20	$ 1,290,534.00
Tamarack (BUR172)	$ 166,410.00	$ 1,290,534.00
Tamarack Millsite (BUR173)	$ 166,410.00	$ 1,394,107.00
Tamarack No. 3 (BUR058)	$ 50,688.20	$ 1,756,926.00
Interstate Millsite (BUR055)	$ 183,401.69	$ 865,842.00
Rex No. 1 (BUR139)	$ 506,970.00	$ 370,017.00
Rex No. 2 (BUR054)	$ 4,520,995.40	$ 372,898.00
EF Ninemile (OSB056)	$ 1,388,632.63	$ 5,459,274.00
Success Mine (OSB044)	$ 2,322,148.41	$ 4,310,730.00
EF Ninemile (OSB057)	$ 1,260,922.07	$ 2,817,940.00
EF Ninemile (OSB058)	$ 1,674,608.71	$ 151,685.00
Success No. 3 (OSB089)	$ 1,029,173.72	$ 5,082,858.00
Alameda Mine (OSB088)	$ 50,688.00	$ 4,480,857.00
EF Ninemile (OSB040)	$ 2,282,380.00	$ 71,361.00
Dayrock Mine (OSB039)	$ 879,326.24	$ -
Option Mine (OSB115)	$ 910,492.00	$ 43,544.00
Daylight (OSB052)	$ 2,184,480.00	$ 108,084.00
Panhandle Mine (OSB116)	$ -	$ 271,952.00
Duluth Mine (OSB032)	$ 351,960.00	$ 745,125.00
Ruth Mine (OSB033)	$ 284,664.00	$ 753,683.00
California No. 4 (OSB038)	$ 537,024.00	$ 291,826.00
Ninemile (OSB059)	$ 1,754,280.00	$ 20,049.00
Ninemile (OSB060)	$ 38,299.20	$ 38,299.20
Blackcloud Millsite (OSB061)	$ 234,318.00	$ -
Monarch Mine (OSB082)	$ 226,452.00	$ 757,640.00
Blackcloud (OSB084)	$ 1,095,619.00	$ 677,556.00
Blackcloud (OSB085)	$ 1,095,619.00	$ 291,826.00
Northside Mine (WAL006)	$ 97,018.80	$ 1,225,561.00
Ninemile (WAL033)	$ 3,896,911.35	$ -
Thomas Consolidate Shaft (OSB054)	$ 21,975.00	$ -
Total Cost	**$ 43,518,203.55**	**$ 43,812,715.20**



LEGEND

- 2008 Stations

Source Areas Included in Alternative 3

- No
- Alternative Needs for Alternative 3

Watershed 2008 Stations (Station ID)

- NM-289
- NM-291
- NM-293
- NM-298
- NM-301
- NM-305
- NM-443

NM289 — Station ID
0.07 lb/day — Dissolved Zinc Load
0.13 — AWQC Ratio

Imagery Source: 2006 1-meter NAIP

0 0.5 1 Miles

INTERNAL USE ONLY-DRAFT

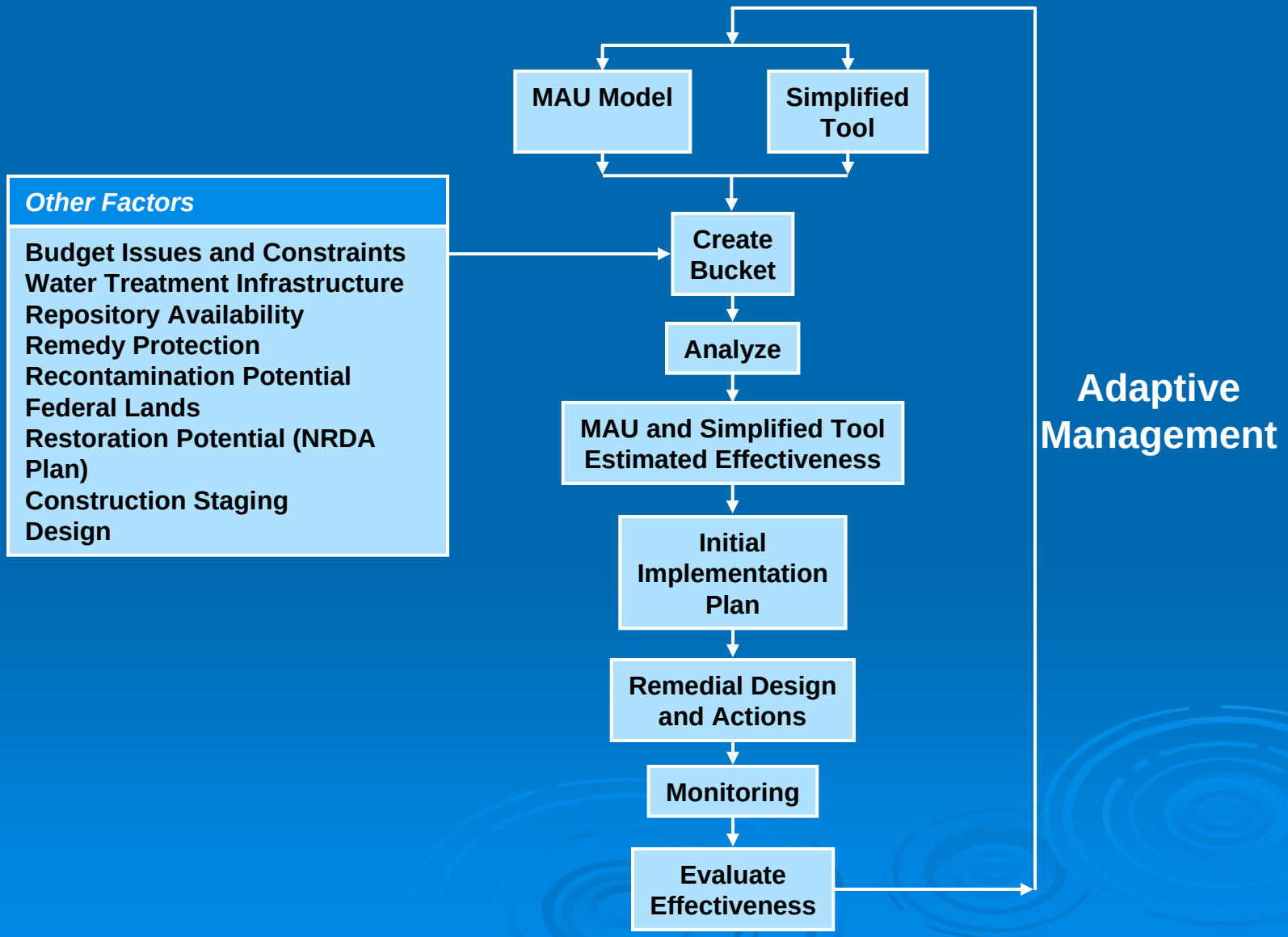
FIGURE 6
AWQC Ratio for Implementation of Alternative 3
Nine Mile Watershed Test Case
USEPA Upper Basin

CH2MHILL

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

Implementation Plan Approach



Implementation Planning Workshop February 24, 2010

- EPA and Consultants Prepare Straw man
- Workshop with PFT
  - Large scale maps and tables:
    - Sites needing water treatment
    - Sites needing regional repositories
    - Remedial action types (e.g., regrade/reveg, excavate and cap on-site)
    - Local repository need by drainage
    - Roads
    - Lead loading
  - Photos
  - MAU model
  - Simplified tool
- Goal to Have a Proposal for 2 different funding scenarios for first 5 and 10 year time frames

Next Steps

- Further refine straw man proposal as funding becomes more certain
- Continue development of text of implementation plan
  - Provide documentation on priority setting process, tools, and rationale
  - Describe frequency and basis for updating plan
  - Describe information used to update the plan
- Continue sharing work products with PFT
- Complete Implementation plan at same time as ROD Amendment

Overall 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
  - Comments due to EPA Feb. 19, 2010

Project Schedule (cont.)

- EPA National Remedy Review Board –
  - Late April 2010
- Summer 2010 – Proposed Plan comment period
  - Opportunity to review and comment on draft cleanup plan, Draft Final Focused Feasibility Study and Draft Administrative Record
  - Open House and Public Meeting
  - Proposed Plan focus at May BEIPC meeting
  - Share information at meetings with key stakeholders
- Fall 2010 – Issue ROD Amendment

Community Engagement

- Upper Basin PFT
  - 10+ technical meetings
  - Sharing preliminary draft sections and draft FFS
  - Updates at TLG, CCC and Commission meetings
- Discussions with Mayors and Shoshone County Commissioners about remedy protection
- Meeting with community groups
- ROD Amendment-focused web page available to public
- Mailings to more than 1300 contacts

ROD Amendment for Upper Basin and Box - Windows Internet Explorer

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

File Edit View Favorites Tools Help Convert Select

ROD Amendment for Upper Basin and Box

U.S. ENVIRONMENTAL PROTECTION AGENCY

Region 10 Cleanup: Bunker Hill Mining & Metallurgical

Serving the people of Alaska, Idaho, Oregon, Washington and 270 Native Tribes

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- Related Links
- Cleanup Work
  - Box
  - Basin
  - Spokane River
  - Completed
- Freedom of Information Act (FOIA)

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.

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.

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**

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

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
- Benefit is long-term job creation
- ROD Amendment development occurring within Basin Commission framework and with additional community involvement opportunities

Thank you!
Questions?

What we have heard so far

- Why such a large list of sites some of which include areas where action has occurred?
- Why can't work along South Fork include levy repairs?
- Will alluvial sorting be considered in cleanup work to reduce volumes?
- Some called for actions don't seem to fit the present site conditions or current use.
- Will mine and mill site work address human health issues at nearby residential property?

Comments (cont)

- What route will the pipeline to the CTP follow?
- How will the costs for the upgrades to the CTP be apportioned to the basin, OU2, and Bunker Hill mine?
- Did EPA acquire the West Mission flats property from Asarco?
- Will the actions in the Upper Basin address nutrients to Lake Coeur d'Alene?
- What is revegetation – is it hydroseeding or more?
- Will the drains capture all of the groundwater?