

NAS Review Committee Tour

April 14, 2004

THE NATIONAL ACADEMIES

Advisers to the Nation on Science, Engineering, and Medicine

Second Meeting of the National Research Council's Committee on Superfund Site Assessment and Remediation in the Coeur d'Alene River Basin

PUBLIC AGENDA

Wednesday, April 14, 2004

Coeur d'Alene River Basin Tour

*****NOTICE*****

The presentation at each of the nine stops is open to the public. The times listed are approximate. The committee will hear brief presentations from designated individuals only at those sites listed as "Stops". The organization providing the presentation is listed in *italics*. The duration of each stop will be approximately 20 minutes. For those sites listed to be viewed, the committee will not hear comments from outside parties.

If there are general questions relating to the tour, please contact Dr. Karl Gustavson, National Research Council, at (202) 334-1253. If specific directions to the sites are needed, please call Ed Moreen, U.S. EPA, at (208) 664-4588 or the Idaho Department of Environmental Quality at (208) 783-5781.

<u>Time</u>	<u>Location</u> <i>(Site Presenter)</i>
8:30 AM	<u>Stop 1</u> : Star Road Gravel Bar Complex — common-use area identified for cleanup in the Record of Decision <i>Washington State Department of Ecology representative</i> View Lake Coeur d'Alene View Rails to Trails Site/Trail of the Coeur d'Alenes (Black Rock Trailhead) — recreational area undergoing remediation
10:00 AM	<u>Stop 2</u> : Lane Marsh Overlook — wetland area identified for cleanup in the Record of Decision <i>U.S. Fish and Wildlife Service representative</i>
10:40 AM	<u>Stop 3</u> : Killarney Lake Boat Launch — completed remediation site <i>Bureau of Land Management and U.S. Fish and Wildlife Service representatives</i>

(Note: Limited restrooms are available)

View East of Rose Lake Boat Launch — recreational area undergoing remediation

11:30 AM Stop 4: Cataldo Mission and Cataldo Flats — historically and culturally important site
Coeur d'Alene Tribe representative

(Note: Limited restrooms are available)

View Old Mission State Park – area of previous South Fork Coeur d'Alene River dredging, adjacent to dredge spoils deposit area – site of previous and proposed remediation

1:15 PM View confluence of North Fork and South Fork Coeur d'Alene Rivers

View Smeltonville Flats (adjacent to the South Fork) – site of past removal actions, north side of I-90

View hillsides revegetation project

View location of former smelter complex

2:00 PM Stop 5: Bunker Hill “Box” - stop on McKinley Ave, west of IDEQ office — Central Treatment Plant, former industrial areas (Operable Unit 2), Central Impoundment Area
U.S. Environmental Protection Agency representative

(Note: Limited restrooms are available)

2:30 PM Stop 6: New Bunker Hill Mining Company mine site

View Eagle Crest condominium development at base of Silver Mountain gondola – area of economic redevelopment

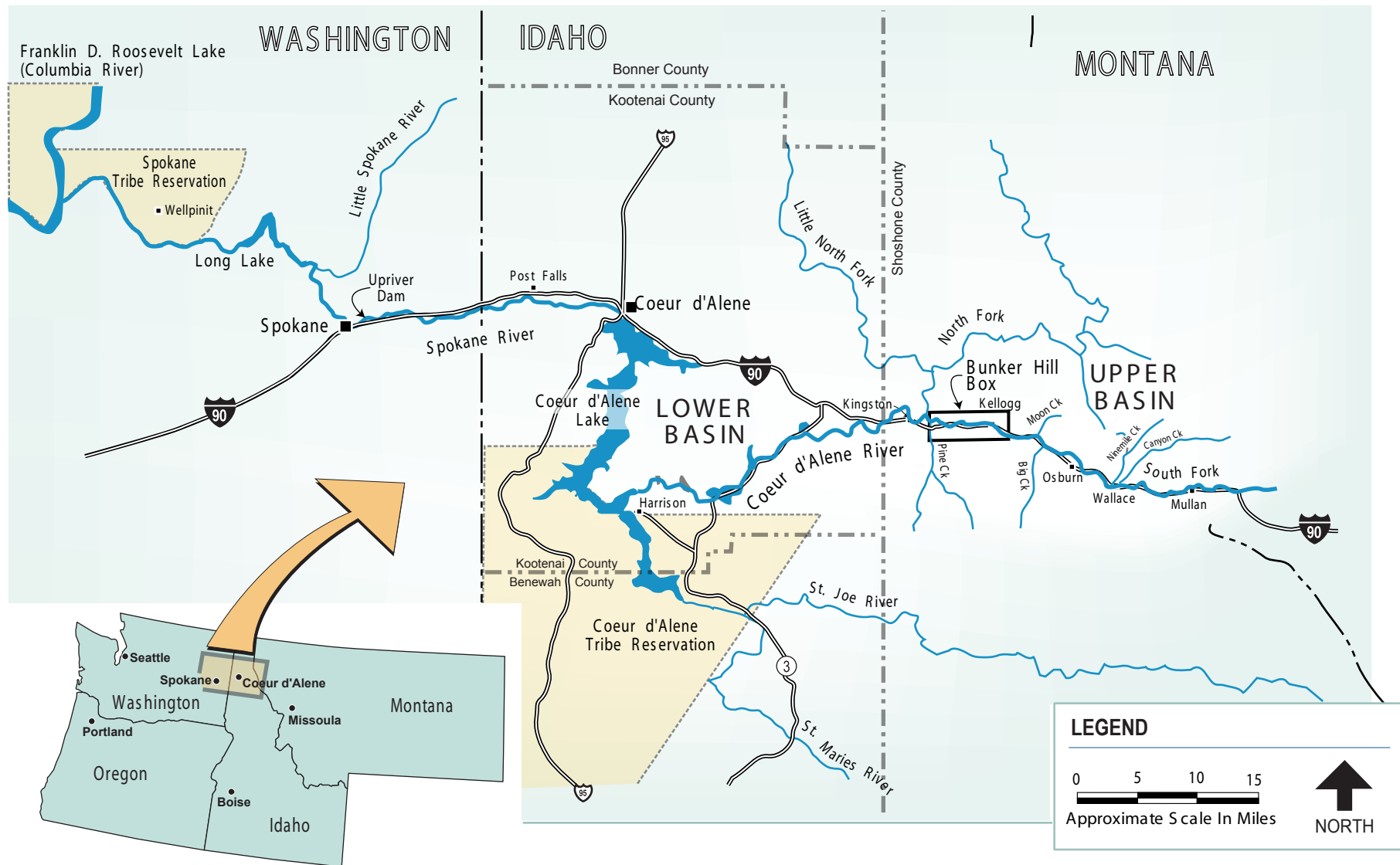
View Kellogg Middle School – completed remediation site

3:20 PM Stop 7: Big Creek Repository — primary repository for Coeur d'Alene River Basin yard remediations.
U.S. Environmental Protection Agency and Idaho Department of Environmental Quality representatives

4:10 PM Stop 8: Residential Remediation Example — Osburn, ID
Idaho Department of Environmental Quality and Panhandle Health District representatives


(Note: Limited restrooms are available on I-90 following the Big Creek Repository site at Wallace Visitors' Center)

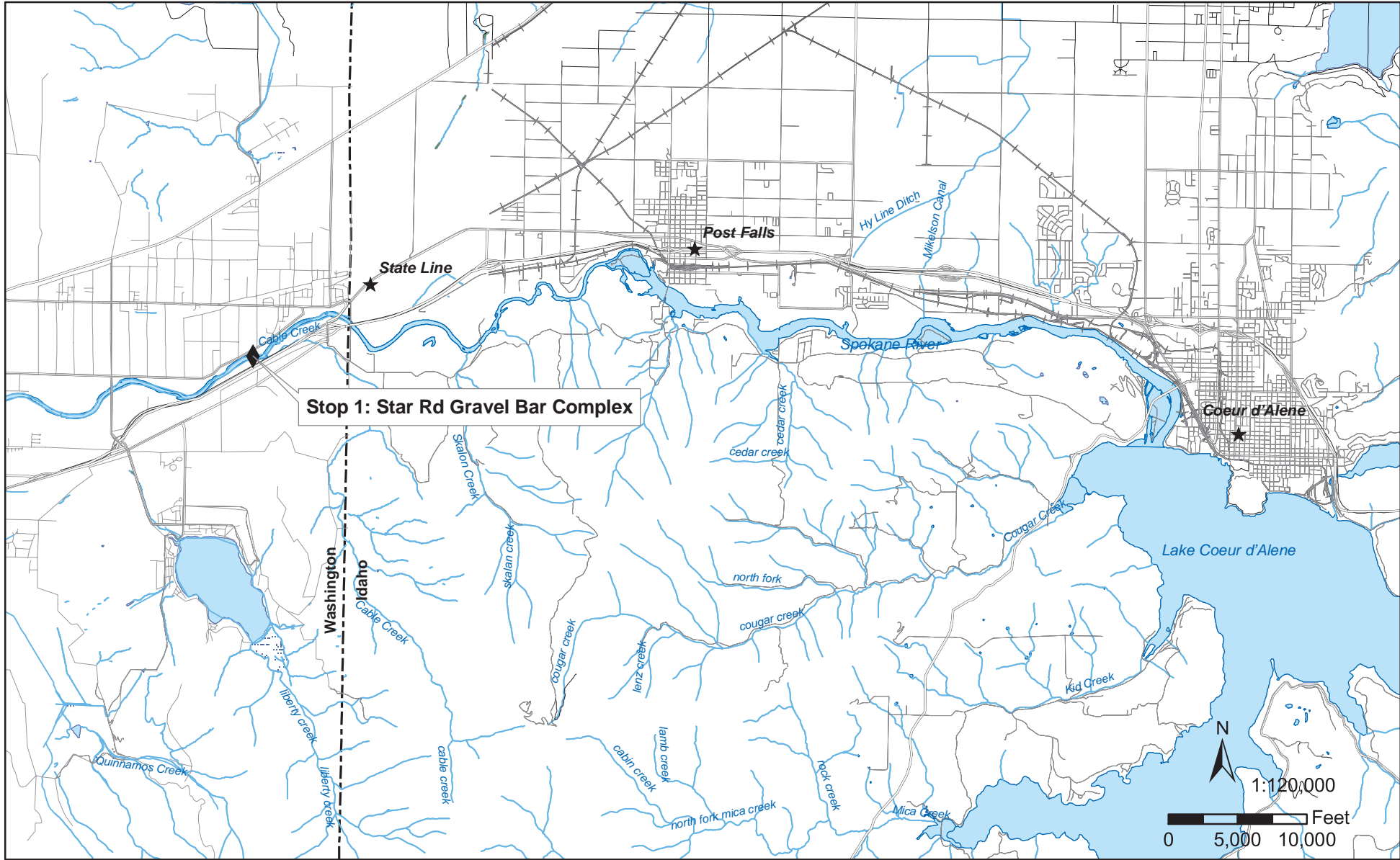
- 5:00 PM Stop 9: Woodland Park, Canyon Creek and Floodplain — area identified for remediation in the Record of Decision
U.S. Environmental Protection Agency representative
- View Town of Burke, Hecla-Star mine and mill site, and Canyon Creek headwaters
- 6:30 PM End tour



LEGEND

0 5 10 15
 Approximate Scale In Miles


 NORTH



Stop 1: Star Rd Gravel Bar Complex

Washington

Idaho

State Line

Post Falls

Coeur d'Alene

Lake Coeur d'Alene

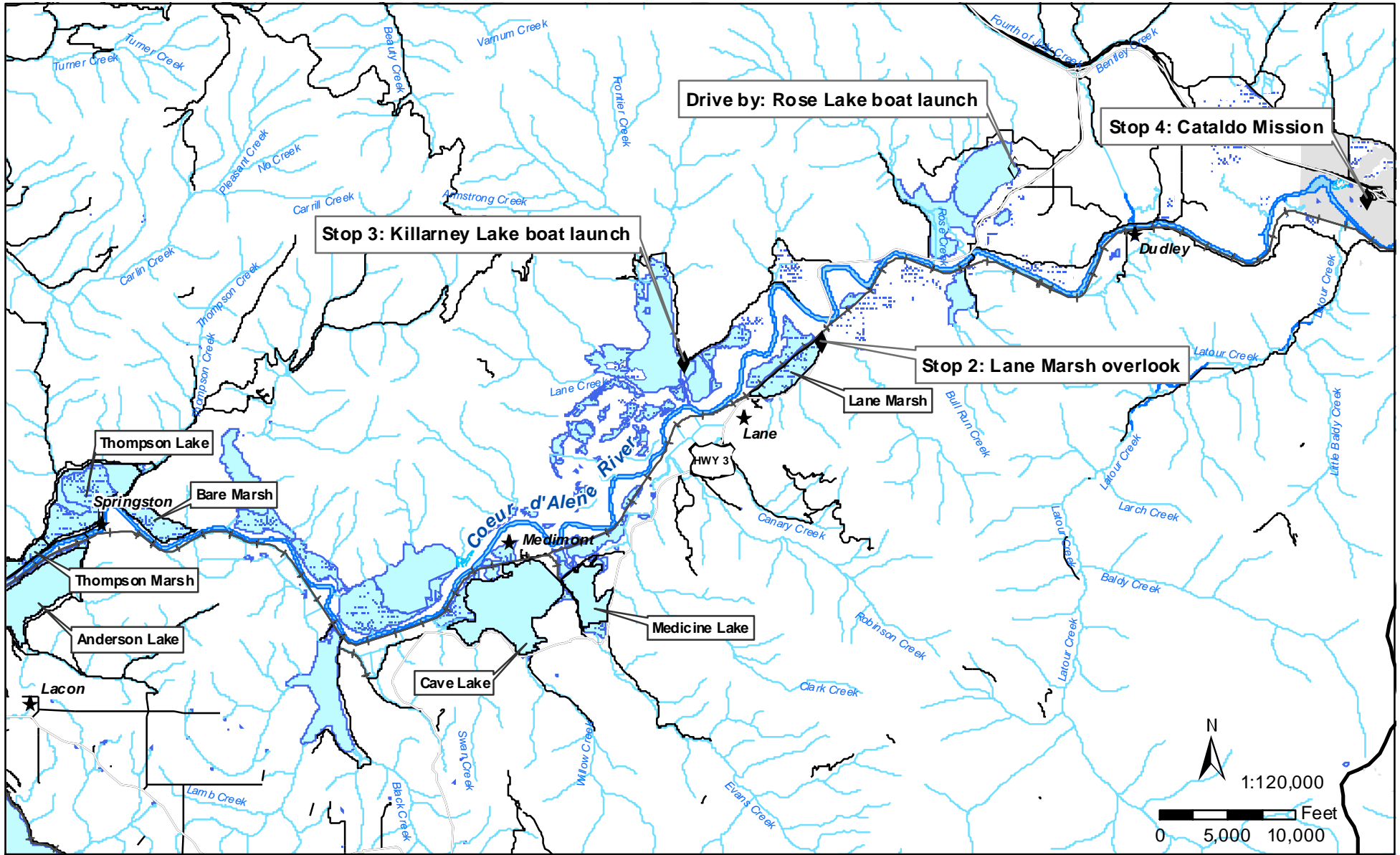
1:120,000

0 5,000 10,000 Feet

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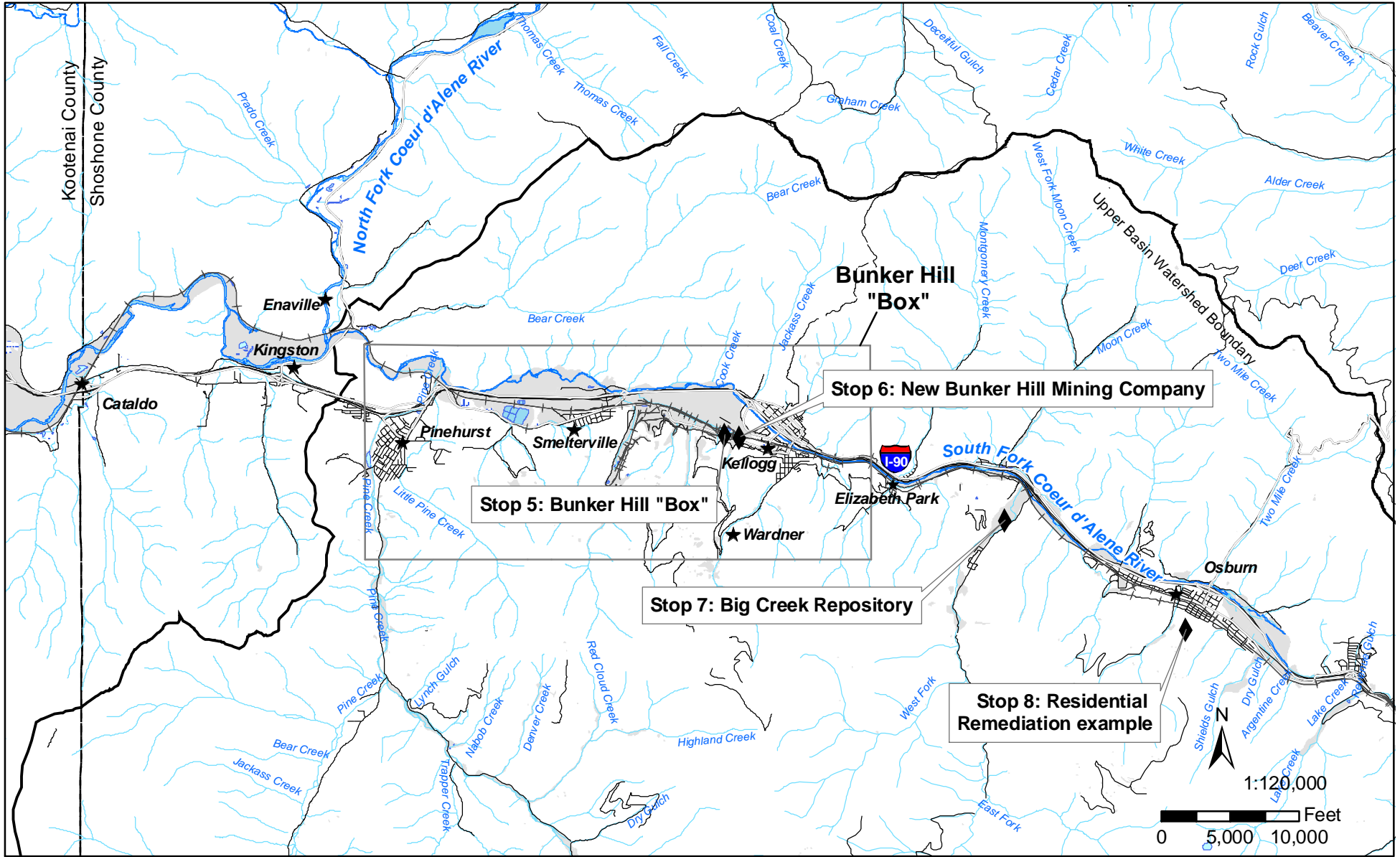
- ◆ NAS Tour Site Stop
- ◇ NAS Tour Drive by
- ★ Cities

- Roads
- Railroad / Rails to Trails
- Streams
- Rivers
- Lake
- Wetland
- Marsh



Legend

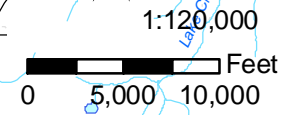
- ◆ NAS Tour Site Stop
- ◇ NAS Tour Drive by
- ★ Cities
- Upper Basin Watershed Boundary
- Lake and Wetland areas identified for cleanup
- Roads
- Railroad / Rails to Trails
- Streams
- Rivers
- Lake
- Wetland
- Marsh

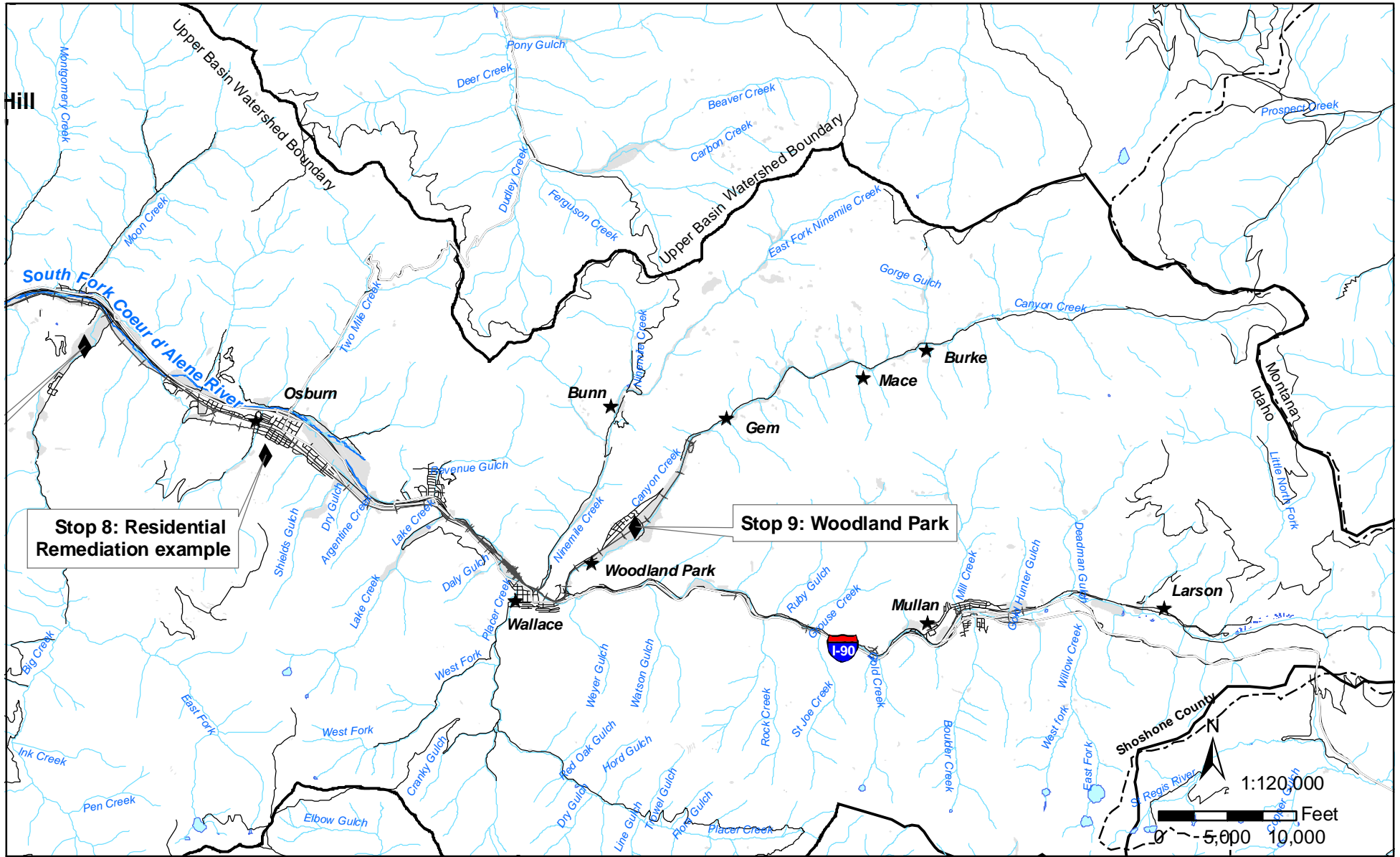


Legend

- ◆ NAS Tour Site Stop
- ◇ NAS Tour Drive by
- ★ Cities
- Upper Basin Watershed Boundary
- BLM Mine Sites

- Roads
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- Marsh

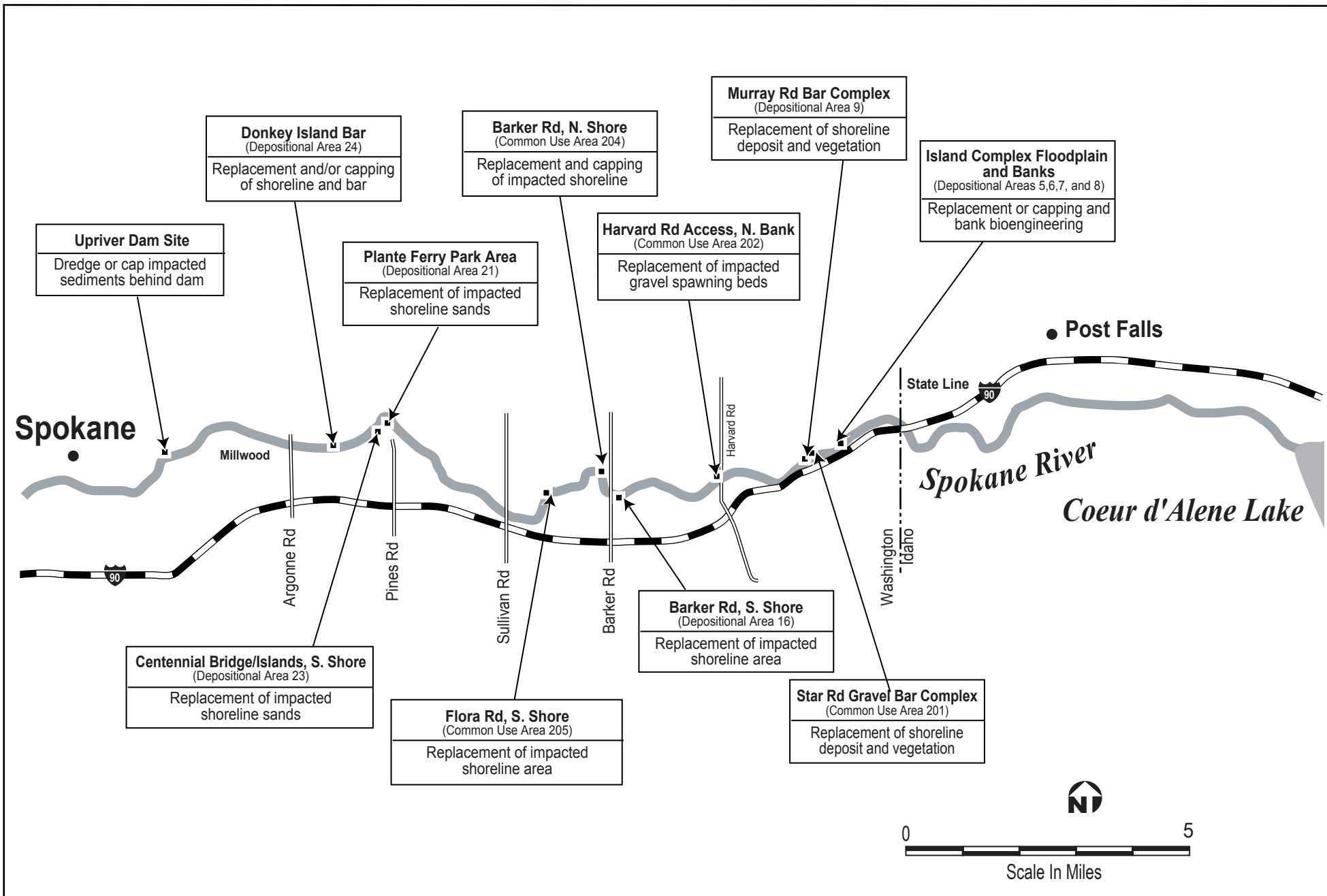




Legend

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- Roads
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027-RI-CO-102Q
Coeur d'Alene Basin RI/FS
RECORD OF DECISION

Doc. Control: 4162500.07099.05.a
EPA No. 2.9

Figure 12.4-1
Spokane River Cleanup Actions

STAR RD. RECREATIONAL / AQUATIC HABITAT SITE [a.k.a. River Rd 95 or CUA 201] *

Result **	BULK mg/Kg								SIEVED (175u) mg/Kg							
	Antimony	Arsenic	Cadmium	Iron	Lead	Manganese	Mercury	Zinc	Antimony	Arsenic	Cadmium	Iron	Lead	Manganese	Mercury	Zinc
Average	ND	31.5	5.7	19,500	539	941	0.1	1,250	2.1	26.2	15.5	28,300	1,410	2,210	0.3	2,710
Maximum	<3.3	136.0	10.3	25,000	1,350	1,810	0.3	1,990	4.1	35.1	21.0	28,000	2,360	2,890	0.6	3,320
UCL95		51.0			1,851				3.2	29.3	17.6	27,286	2,508	2,549	0.4	3,023

* State MTCA Cleanup Criteria Factors

- 10% or more of samples \geq 700 Pb (175u) Human Health
- 1 or more samples $>2X$ cleanup levels for Pb (175u) Human Health
- As UCL is more than $2X$ 10 ppm (175u) Human Health
- 10% or more of samples $>$ 10 ppm As (175u) Human Health
- 1 or more samples $>2X$ cleanup level for Zn, Ecol.
- 10% or more of samples $>$ 410 Zn, Ecol.
- 10% or more of samples $>$ 5 Cd, Ecol.
- 1 or more samples $>2X$ cleanup level for cd, Ecol.

** Derived from 7 discrete samples

Subset of Relevant Federal and State References

EPA, Screening Level Human Health Risk Assessment of Nonresidential Receptors, Spokane River, Washington, Coeur d'Alene Basin RI/FS, September 2000

EPA, Final Field Sampling Plan Addendum No. 18 – Fall 2000 Field Screening of Sediment in Spokane River Depositional Areas, Summary of Results, January 2001

EPA, Remedial Investigation Report, Coeur d'Alene Basin, September 2001

EPA, Feasibility Study Report, October 2001

EPA, Record of Decision, The Bunker Hill Mining and Metallurgical Complex Operable Unit 3, September 2002.

EPA, Prediction of sediment toxicity using consensus-based freshwater sediment quality guidelines, June 2000, EPA905/R-00/007

WDOE, Creation and Analysis of Freshwater Sediment Quality Values in Washington State, July 1997, No. 97-323a.

Chapter 173-340 WAC, State of Washington Model Toxics Control Act



The Spokane Valley - Rathdrum Prairie Aquifer

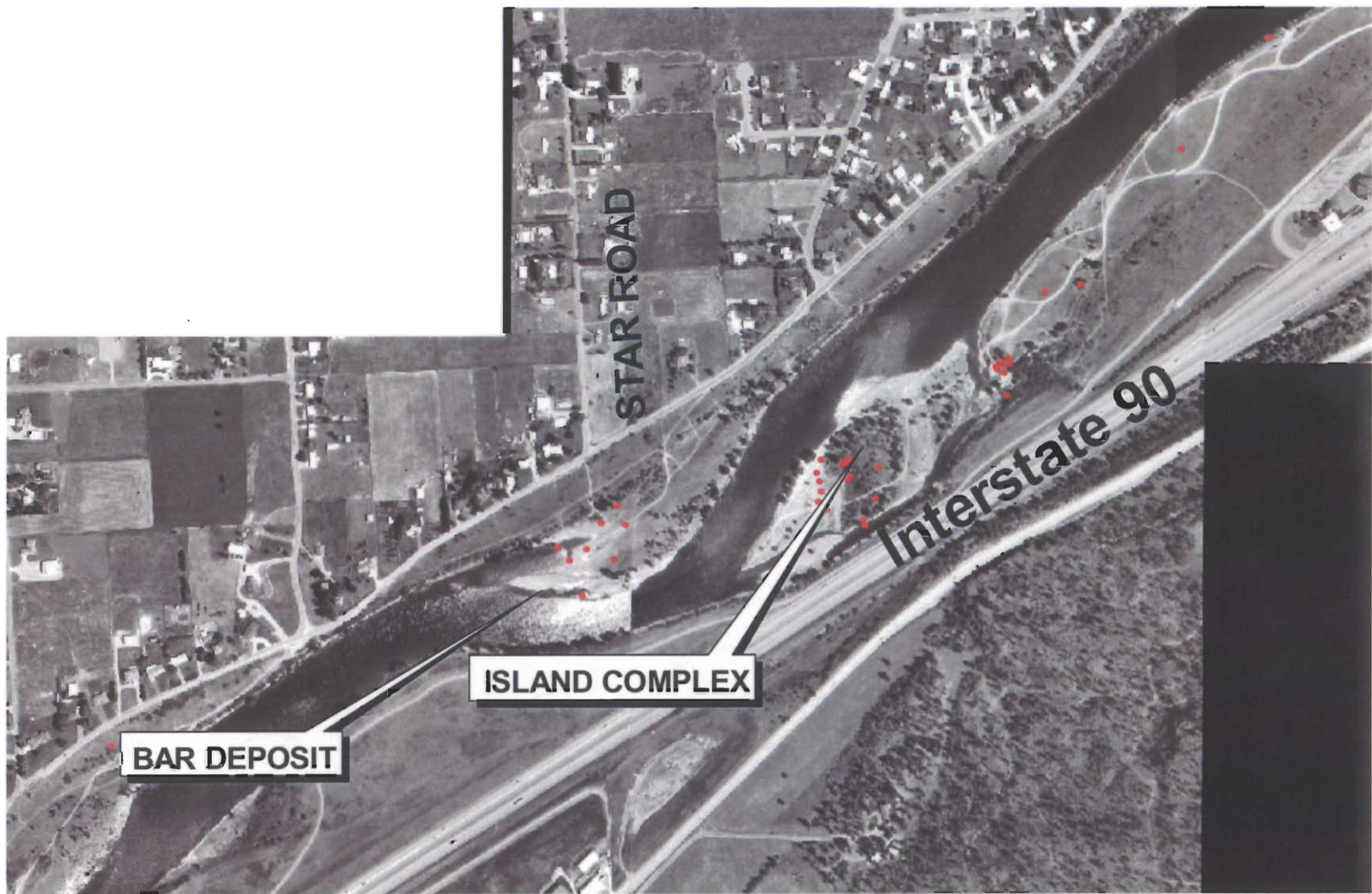

 The Spokane Valley - Rathdrum Prairie Aquifer

This poster is adapted from the cover of "The Spokane Valley-Rathdrum Prairie Aquifer Atlas", produced by the Spokane County Water Quality Management Program and the Idaho Department of Fish and Game, 2002.

April 2004



April 2004



April 2004

Stop 1 Drive By:

City of Coeur d'Alene,
Lake Coeur d'Alene from Highway

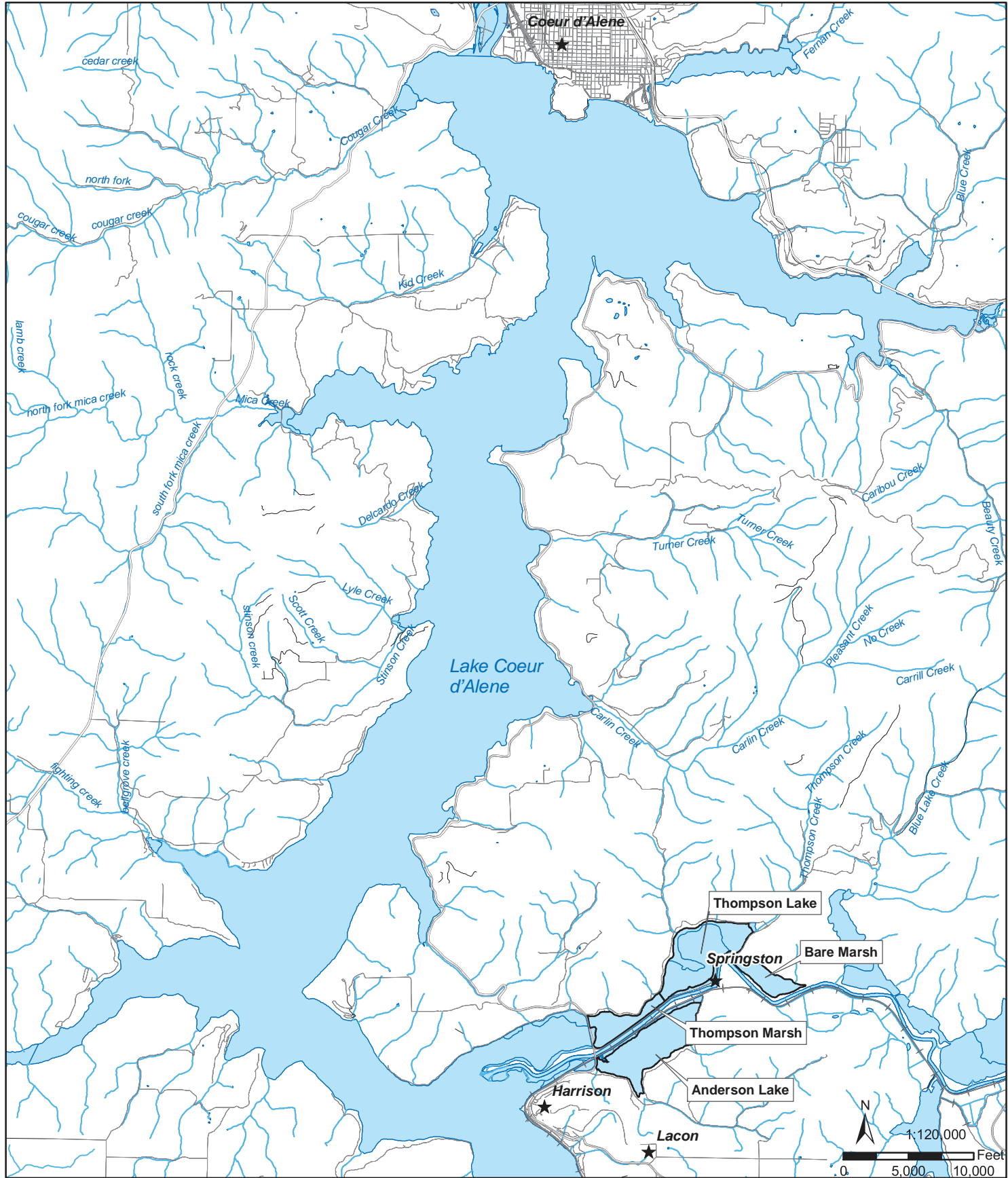
COEUR D'ALENE LAKE

STATUS

EPA did not designate a remedial action for Coeur d'Alene Lake in the 2002 Record of Decision for OU-3. It is anticipated that the Lake will be the subject of a future Record of Decision.

BACKGROUND

- USGS estimates approximately 75 million metric tons (49.7 million cubic yards) of metals-contaminated sediment on the bottom of the Lake (Bookstrom 2001).
- The Coeur d'Alene River is the overwhelmingly dominant source of metals to Coeur d'Alene Lake.
- Lake has a short hydraulic-residence time (average of one-half year).
- The net result of physical, chemical, and biological processes within the Lake was to retain the following approximate percentages of its riverine and benthic input loads (dissolved plus particulate): cadmium, 50 percent; lead, 90 percent; zinc, 35 percent; nitrogen, 5 percent; and phosphorus, 30 percent.
- Concentrations of metals in the water of Coeur d'Alene Lake often exceed ambient water quality criteria, but not necessarily at all locations or even at all depths at any given location.
- A full discussion of contaminant fate and transport processes associated with the Lake may be found in Section 5.3.8 of the Final RI Report (EPA 2001).
- Concentrations of metals in lake sediment exceed ecological thresholds for the protection of benthic invertebrate communities.
- Metals concentrations in Lake water generally meet the safe drinking water standards for metals, except during some periods of high flow from the Coeur d'Alene River.
- Post RI/FS sampling and analysis of fish from the Lake is described in "Coeur d'Alene Lake Fish Investigation Data Report" (URS April 2003). An assessment of these findings resulted in fish advisories from the State of Idaho and the Coeur d'Alene Tribe.



Legend

- ◆ NAS Tour Site Stop
- ◇ NAS Tour Drive by
- ★ Cities
- 🌿 Lake and Wetland areas identified for cleanup

- 🛣️ Roads
- 🚂 Railroad / Rails to Trails
- 🌊 Streams
- 🌊 Rivers
- 🌊 Lake
- 🌿 Wetland
- 🌿 Marsh



Tundra swans in Strobl Marsh. Photo taken on March 30, 2004.



Lifeless tundra swan in Strobl Marsh. Photo taken on March 30, 2004.

Lower Basin Wildlife Summary and Conclusions

- Numerous wildlife investigations have documented lead exposure and lead related injuries in at least 27 species of wildlife inhabiting approximately 8,100 hectares of the Coeur d'Alene River Basin floodplain. Physiological malfunctions, physical deformations, and mortality and morbidity were confirmed throughout emergent wetland, riparian, lacustrine, and agricultural habitats of the basin.
- Twelve species of wildlife, including mammals and migratory birds, have been diagnosed with lead poisoning without the presence of lead artefacts. The source of lead was ingested contaminated soil/sediments. The frequency of lead poisoning as a cause of death in tundra swans is substantially greater in the Coeur d'Alene River Basin compared to the St. Joe River Basin, Pacific Flyway, and nationwide.
- Concentrations of lead in tissues of wildlife are greater than the toxicity thresholds provided by Pain (1996) for waterfowl, Ma (1996) for mammals, and Franson (1996) for songbirds and raptors. Lead residues in both blood and liver tissues of waterfowl exceed severe clinical poisoning thresholds. Clinical poisoning thresholds are exceeded in mammals. Subclinical poisoning thresholds are exceeded in songbirds and some raptors.
- Increased soil or sediment contact via feeding (i.e. ingestion) suggests greater lead exposure. For example, species (i.e. waterfowl) feeding directly on food items in soil/sediments or with attached soil/sediment had greater lead concentrations in tissue than higher trophic level receptors such as raptors.
- Controlled laboratory studies (Day et al. 1998, Heinz et al. 1999, Hoffman et al. 2000a, Hoffman et al. 2000b) confirmed that the lead in Coeur d'Alene River Basin sediments is bioavailable and causes adverse effects observed in the field. The effects observed in laboratory studies were similar to responses observed in waterfowl examined in the Coeur d'Alene River Basin, including physiological malformations, physical deformation, and death.
- Increasing exposure to lead resulted in an increase in the number and severity of adverse effects, from physiological malfunctions to physical deformations and for several receptors, to death.
- No decrease in sediment lead concentrations was found during a 24 year period (1971- 1995) based on Campbell et al. (1999) and no substantial changes in wildlife tissue lead concentrations have been documented in 15 years (1982 - 1997) in the Coeur d'Alene River Basin floodplain (Audet 1997). Lead exposure and associated injuries to wildlife inhabiting the Coeur d'Alene River Basin floodplain are anticipated to continue, unless substantial measures are taken to reduce lead concentrations in soil and sediments.

Pathways

• Sediment lead concentrations - According to Campbell et al. (1999), the mean sediment lead concentration in the Coeur d’Alene River Basin (3,284 ppm) was significantly greater ($p = <0.0001$) than in the reference location, the St. Joe River Basin (17 ppm). There were 555 samples collected in the Coeur d’Alene River Basin and 126 collected in the St. Joe River Basin.

• Sediment ingestion - Field investigations of wildlife inhabiting the Coeur d’Alene River floodplain found that the primary exposure to lead is from the ingestion of contaminated soils and sediments (Beyer et al. 1997, 1998). Wood ducks ingest <2 percent sediment (Beyer et al. 1997). Beyer et al. (1998) estimated Canada geese and swans ingestion rates at 9 percent and mallards at 6 percent. The 90th percentile for swans was 22 percent sediment ingestion. Beyer et al. (1998) found sediment lead concentrations correlated with fecal lead concentrations ($r = 0.91, P < 0.05$) at Coeur d’Alene River Basin sites (n=11).

Wildlife field investigations

• Since 1981, wildlife representing 27 species have been documented with various degrees of lead exposure. They are:

tundra swan	Canada goose	common merganser	bald eagle
trumpeter swan	mallard	red-tailed hawk	muskrat
northern pintail	wood duck	osprey	w. screech owl
mink	canvasback	American wigeon	northern harrier
great-horned owl	common goldeneye	redhead	American kestrel
beaver	meadow vole	deer mouse	American robin
savannah sparrow	song sparrow	tree swallow	

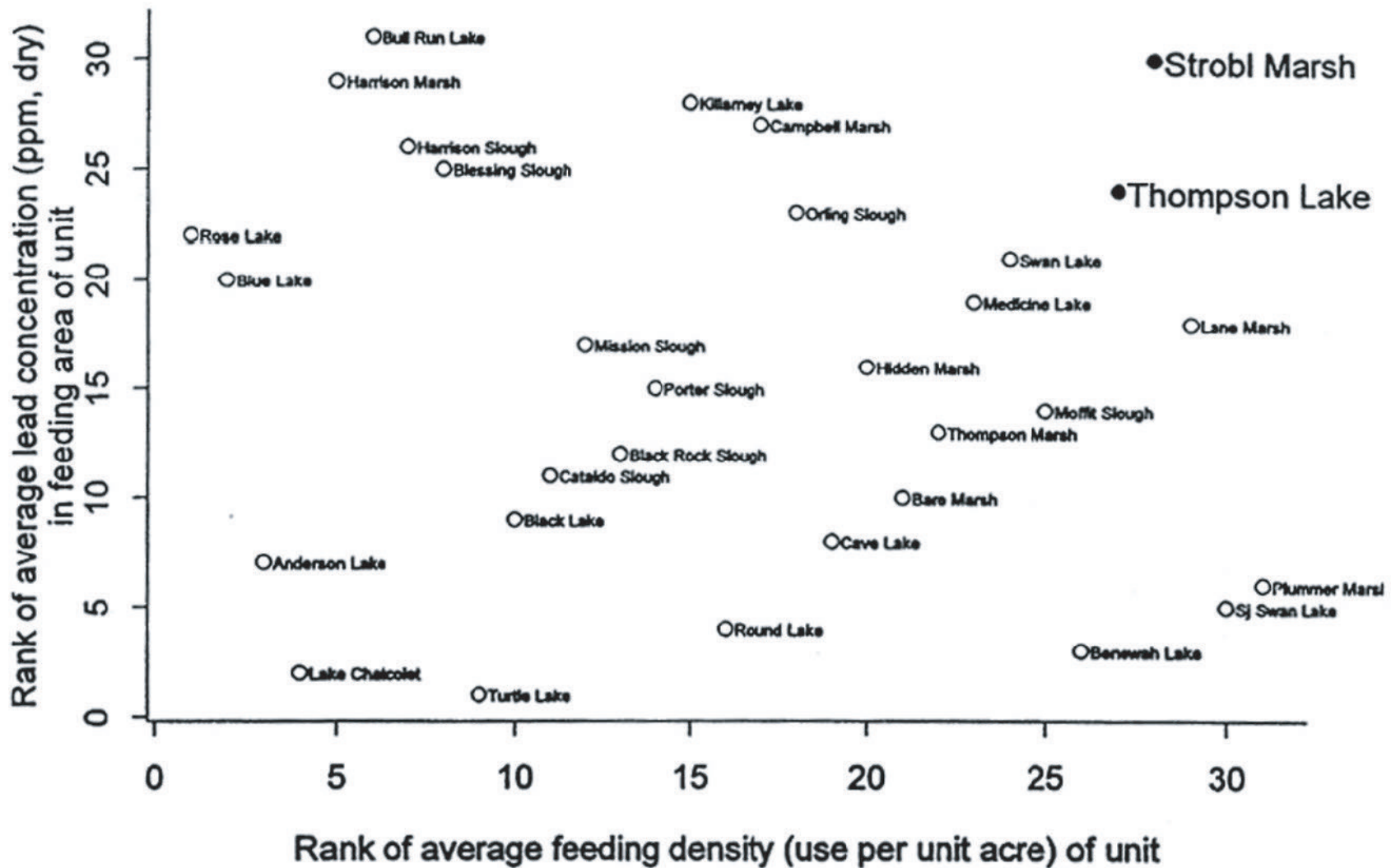
Wildlife inhabiting the Coeur d’Alene River basin floodplain exhibit the following injuries caused by lead exposure:

Physiological malfunctions - Field investigations identified physiological malfunctions caused by lead exposure in 9 species of migratory birds in the Coeur d’Alene River Basin (Blus et al. 1991, Henny et al. 1991, Blus et al. 1993, Henny et al. 1994, Audet et al. 1999a, Blus et al. 1999a,b, Johnson et al. 1999, Henny et al. 2000). These malfunctions are primarily associated with inhibition of the formation of red blood cells including delta-aminolevulinic acid dehydratase (ALAD) inhibition, elevation of protoporphyrin, reductions in hemoglobin and hematocrit levels.

Physical deformations - As part of diagnostic evaluation and necropsy procedures, numerous physical deformations caused by lead exposure were identified (Audet et al. 1999b, Sileo et al. 2001). Gross lesions found included: impacted masses of ingesta in the upper gastrointestinal tract, emaciation, atrophy of muscle and viscera, gall bladder containing copious thick dark green bile, and bile staining of the gizzard lining, upper gastrointestinal tract and perianal plumage. Microscopic lesions of lead poisoning observed included myocardial necrosis, arterial fibrinoid necrosis, hemosiderosis, and renal lead inclusions.

Mortality and morbidity –From 1992 – 97, 92 percent of all lead-poisoned wildlife collected from the Coeur d’Alene River Basin had not ingested lead artefacts. Lead poisoning associated with the ingestion of contaminated sediments (i.e. presence of no artefacts) was the greatest single cause of death (71.7%, n= 223). To date, eleven species of waterfowl and one species of mammal have been documented with lead poisoning without the presence of lead artefacts. They are:

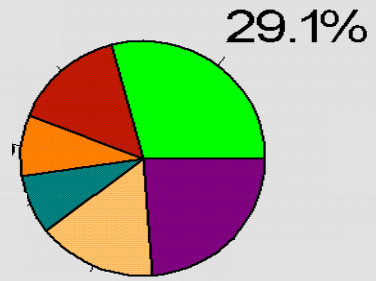
tundra swan	canvasback	trumpeter swan	redhead	mallard
common goldeneye	northern pintail	common merganser	Canada goose	wood duck
American wigeon	meadow vole			



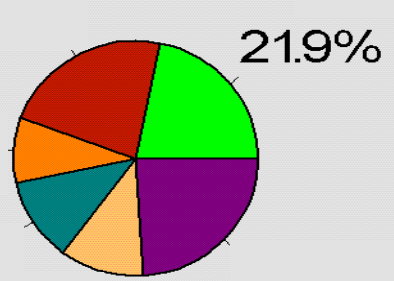
Prioritization Chart for Wetlands in CSM Unit 3 Based on Lead Concentration and Waterfowl Feeding Density

Comparison of nationwide (1981-1988; Bartonek et al. 1991), Pacific Flyway (1980-1993; NWHC, unpubl. data, St. Joe (SJR) and Coeur d'Alene (CDARB) River Basins (1992-1997; Audet et al. 1999b) swan mortality data. Lead poisoning diagnoses include those with and without the presence of ingested lead artefacts.

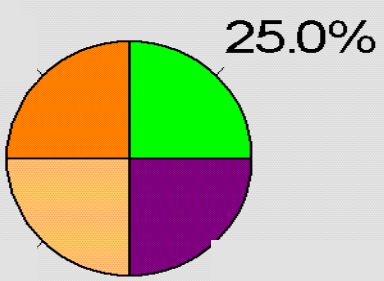
Nationwide



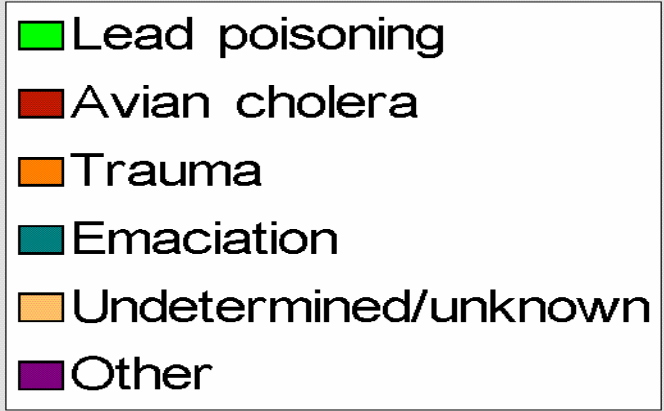
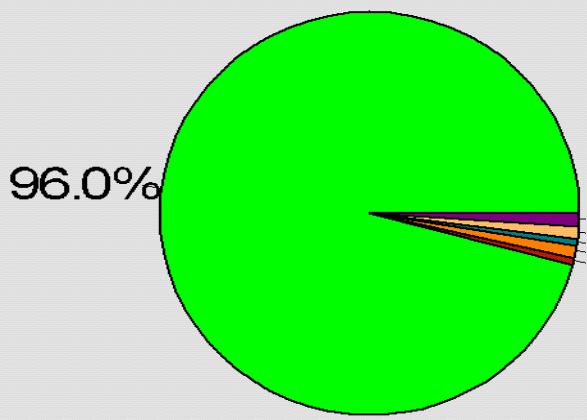
Pacific Flyway



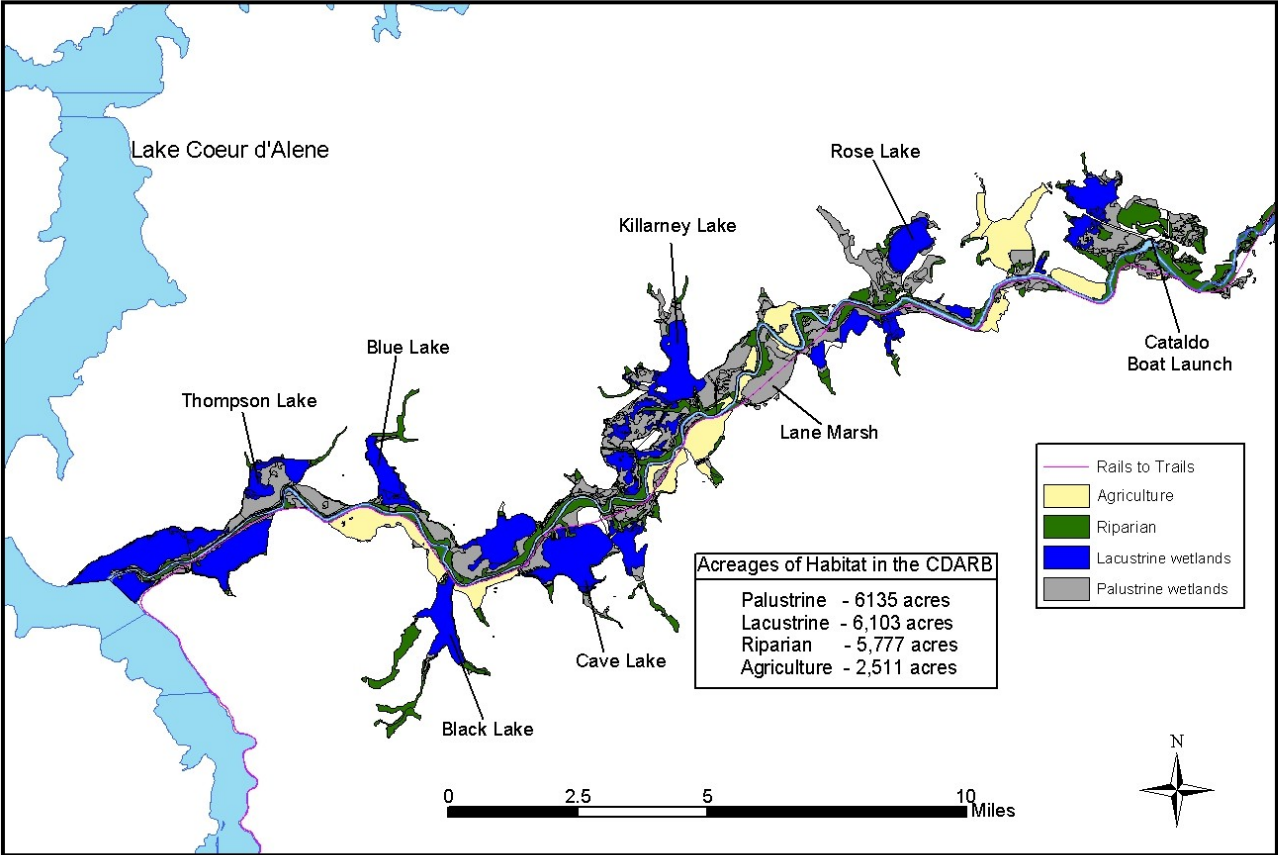
SJR



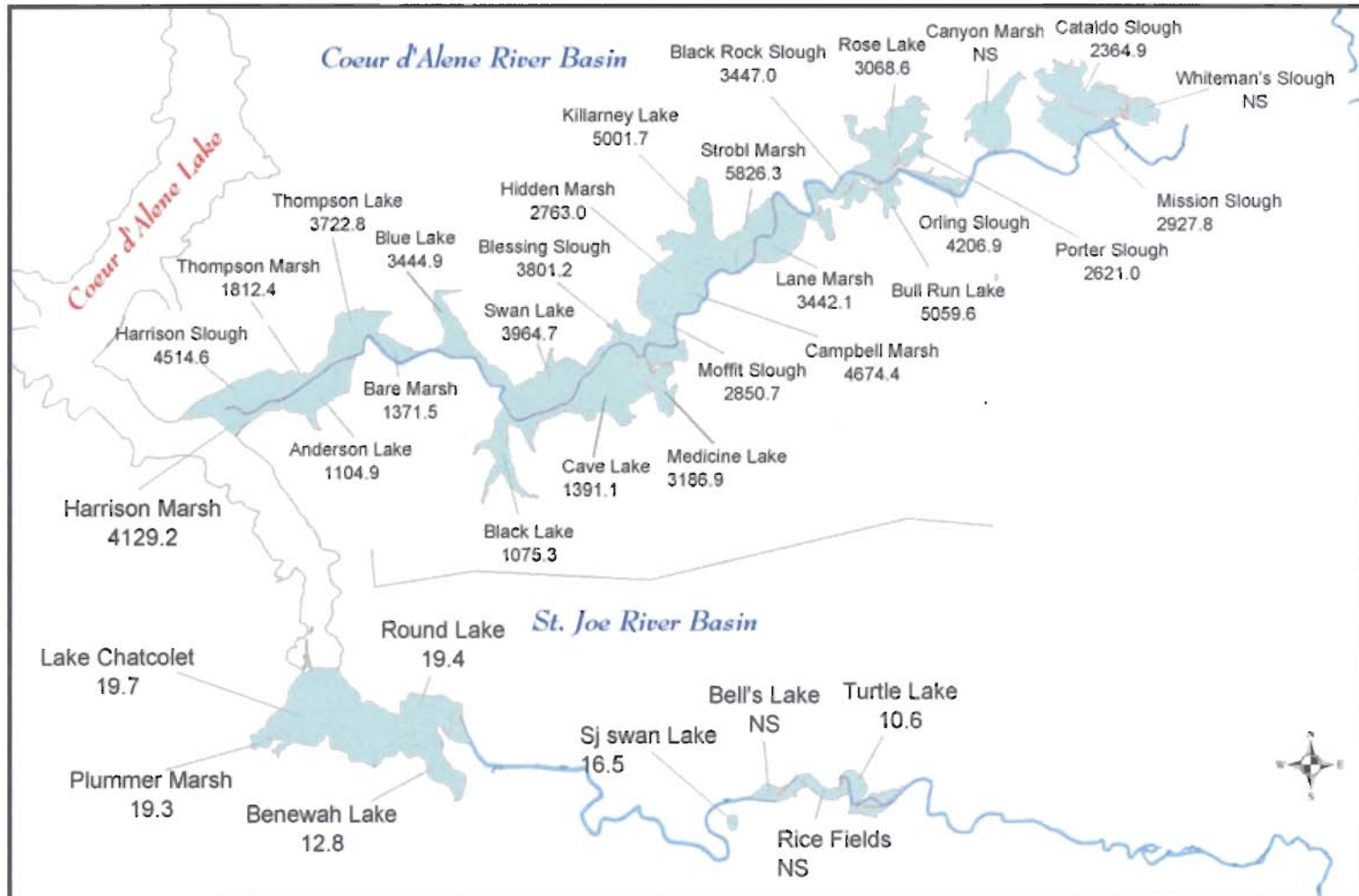
CDARB



Floodplain Vegetation Types of the Lower Coeur d'Alene River Basin.



Mean lead concentration (ppm, dry wt.) in sediment for wetlands in the Coeur d'Alene Basin, 1995.



Stop 2 Drive By:

Highway 3,
Trail of the Coeur d'Alenes (Black Rock Trailhead)

REMEDICATION OF LOWER BASIN RECREATIONAL AREAS - HIGHWAY 3/TRAIL OF THE COEUR D'ALENES

BACKGROUND

→ Under the 2002 Record of Decision for OU-3 (Coeur d'Alene Basin), formal recreational areas such as boat ramps, picnic areas and campgrounds with surface soils containing elevated metals concentrations (Pb > 700 mg/kg and arsenic > 100 mg/kg) will be remediated.

→ Two Lower Basin recreational areas are currently being remediated in 2003-2004. Both projects were approved by the Coeur d'Alene Basin Environmental Improvement Project Commission in May 2003. Cleanup actions are occurring at:

- The East of Rose Lake Boat Launch and
 - The Highway 3/Trail of the Coeur d'Alenes (Black Rock Trailhead) crossing site.
- The goal for both sites is to reduce human exposure to lead and arsenic contaminated soil/sediment and build upon an existing recreational facility to create clean oases for recreational use.

→ Under the Coeur d'Alene Basin Environmental Improvement Project Commission, the Lower Basin Recreational Area Project Focus Team (PFT) was established by the Technical Leadership Group to focus on remediation of Lower Basin recreational areas. Members of the Citizens' Coordinating Council participated in the group as well. To guide future cleanup of recreational areas in the Lower Basin, the following design objectives were identified by the Recreational Area PFT and CCC group:

- Primary objective is to protect human health, particularly young children,
- Design to minimize long-term operation and maintenance costs,
- Create clean oases for public use (based upon community interests),
- "Reality check" the scale and scope of what can be done (e.g., potable water, septic systems, etc.),
- Build upon existing features to enhance use and reduce risks to human health,
- Provide enough amenities to attract folks to clean "safe" areas but do not create attractive nuisances or beautification-only projects, and
- Design individual recreational sites to be consistent with overall strategy for Basin recreational areas.

→ After a review of candidate sites in the Lower Basin, the Recreational Area PFT and CCC group selected the East of Rose Lake boat launch and Highway 3/Trail of the Coeur d'Alenes sites as the first to be remediated. As noted above, these sites were approved by the Basin Commission. Both are existing sites with high contamination and easy access from Highway 3. The PFT and CCC were involved in scoping of the design alternatives, and review of both 30% and 95% designs. A community meeting was held to share 30% designs with interested community members. The US Army Corps of Engineers initiated work (under an Interagency Agreement with EPA) during the fall of 2003 at the East of Rose Lake boat launch. Remediation at both sites will be finished in prior to the 2004 recreational season.

EAST OF ROSE LAKE BOAT LAUNCH PROJECT SUMMARY

- East of Rose Lake Boat Launch is located adjacent to Highway 3 and is primarily owned by Idaho Dept. of Fish and Game (IDFG) with an eastern part of the property owned by USFS (US Forest Service). The site had a dusty dirt parking lot with high levels of metals in the soil/sediment that posed a health risk to humans, especially young children.

- The project goal is to reduce human exposure to lead and arsenic contaminated soil/sediment and build upon an existing recreational facility to create a clean oasis for recreational use.
- EPA is the project lead and due to joint ownership issues, EPA will fund cleanup on IDFG property and USFS will fund actions on their property. US Army Corps of Engineers, under an Interagency Agreement with EPA, completed the design and is managing the remedial action construction.

Remedial Action Specifics

- Cap contamination soil parking lot to accommodate 6 vehicle/trailer spaces and 6 vehicle-only spaces and construct a low-water access boat launch.
- Grade parking lot so majority of the runoff is directed away from river.
- Perform bank stabilization near the boat launch to reduce erosion and human exposure to contaminated banks. A vegetated rock toe wall with occasional large boulders a few feet away from the current eroded bank has been installed. Downstream of the boat ramp, the slope is graded to the rock base and vegetated with native plants. Upstream of the boat ramp, the rock base will grade into layers of synthetic fabric with engineered fill to create a self-supporting steep slope.
- Close off and replace the Highway 3 access with a safer and more convenient access off East River Road and pave road from Hwy 3 to new parking lot access.
- Close off the existing informal access road on USFS property with boulders and natural vegetation.
- Install a protective fence around the historic pioneer schoolhouse.
- Monitor to assess effectiveness of remedial action.

HIGHWAY 3/TRAIL OF THE COEUR D'ALENES (BLACK ROCK TRAILHEAD)

- Idaho Department of Fish and Game owns the site.
- EPA is funding the remedial action and IDFG will provide an informational kiosk and picnic tables.
- Project builds upon existing Trail access point and will create a barrier for contaminated soil adjacent to the existing parking.
- A 20-foot wide strip will be paved to create a safe picnic area.
- A 20-foot wide topsoil/fabric/grass barrier will be installed adjacent to the picnic area.
- A 5-foot wide gravel and boulder barrier will be placed between parking lot and adjacent picnic area.
- Trees will be planted to block view from downstream bald eagle nest.

Contacts for More Information:

EPA – Anne Dailey, dailey.anne@epa.gov, 206-553-2110
 IDFG – Bryan Helmich, bhelmich@idfg.state.id.us, 208-769-1414
 USFS – Jeff Johnson, jkjohnson@fs.fed.us, 208-765-7442



Highway 3/Trail of the Coeur d'Alene (Black Rock Trailhead) parking lot looking westward. Area to be capped is adjacent to the parking lot to the right.

Killarney is a popular recreation site for camping and various day uses, including fishing, boat launching and picnics. The site is maintained by the USDI-Bureau of Land Management, Coeur d'Alene Field Office.

The site is subject to shallow flooding (and deposition of sediments) when the lake is very high. The parking lot was overtopped during several runoff events between 1995-97, with estimated recurrence intervals of roughly 50-100 years.

Following the floods of December 1995 and February 1996, BLM received flood restoration funding from the Department of Interior through a Congressional appropriation. From this funding, the following improvements were completed at the Killarney Recreation Site in November, 1997.

1. The parking lot was paved to cap the contaminated material underlying the site, thereby reducing human exposure to lead. The cap consists of 3 inches of asphalt underlain by a six-inch layer of clean, 1-inch minus gravel.
2. Imported, uncontaminated topsoil was spread to help establish a grassy swale between the parking lot and the lake.
3. The eroded bank was extended outward and shaped with imported, clean backfill material (mixed alluvial gravels and cobbles). The bank was then covered with geotextile and armored with angular riprap.

For additional information, please contact David Fortier, Environmental Protection Specialist, USDI-BLM. (208) 769-5022



Killarney boat launch at low water.



Killarney boat launch after flood.



Sign at Killarney Lake facility.

Stop 3 Drive By:

East of Rose Lake Boat Launch

REMEDIATION OF LOWER BASIN RECREATIONAL AREAS – EAST OF ROSE LAKE BOAT LAUNCH

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- Provide enough amenities to attract folks to clean “safe” areas but do not create attractive nuisances or beautification-only projects, and
- Design individual recreational sites to be consistent with overall strategy for Basin recreational areas.

→ After a review of candidate sites in the Lower Basin, the Recreational Area PFT and CCC group selected the East of Rose Lake boat launch and Highway 3/Trail of the Coeur d’Alenes sites as the first to be remediated. As noted above, these sites were approved by the Basin Commission. Both are existing sites with high contamination and easy access from Highway 3. The PFT and CCC were involved in scoping of the design alternatives, and review of both 30% and 95% designs. A community meeting was held to share 30% designs with interested community members. The US Army Corps of Engineers initiated work (under an Interagency Agreement with EPA) during the fall of 2003 at the East of Rose Lake boat launch. Remediation at both sites will be finished in prior to the 2004 recreational season.

EAST OF ROSE LAKE BOAT LAUNCH PROJECT SUMMARY

- East of Rose Lake Boat Launch is located adjacent to Highway 3 and is primarily owned by Idaho Dept. of Fish and Game (IDFG) with an eastern part of the property owned by USFS (US Forest Service). The site had a dusty dirt parking lot with high levels of metals in the soil/sediment that posed a health risk to humans, especially young children.

- The project goal is to reduce human exposure to lead and arsenic contaminated soil/sediment and build upon an existing recreational facility to create a clean oasis for recreational use.
- EPA is the project lead and due to joint ownership issues, EPA will fund cleanup on IDFG property and USFS will fund actions on their property. US Army Corps of Engineers, under an Interagency Agreement with EPA, completed the design and is managing the remedial action construction.

Remedial Action Specifics

- Cap contamination soil parking lot to accommodate 6 vehicle/trailer spaces and 6 vehicle-only spaces and construct a low-water access boat launch.
- Grade parking lot so majority of the runoff is directed away from river.
- Perform bank stabilization near the boat launch to reduce erosion and human exposure to contaminated banks. A vegetated rock toe wall with occasional large boulders a few feet away from the current eroded bank has been installed. Downstream of the boat ramp, the slope is graded to the rock base and vegetated with native plants. Upstream of the boat ramp, the rock base will grade into layers of synthetic fabric with engineered fill to create a self-supporting steep slope.
- Close off and replace the Highway 3 access with a safer and more convenient access off East River Road and pave road from Hwy 3 to new parking lot access.
- Close off the existing informal access road on USFS property with boulders and natural vegetation.
- Install a protective fence around the historic pioneer schoolhouse.
- Monitor to assess effectiveness of remedial action.

Contacts for More Information:

EPA – Anne Dailey, dailey.anne@epa.gov, 206-553-2110

IDFG – Bryan Helmich, bhelmich@idfg.state.id.us, 208-769-1414

USFS – Jeff Johnson, jkjohnson@fs.fed.us, 208-765-7442



Existing dusty unpaved parking area at the East of Rose Lake Boat Launch Site, looking upstream on the Coeur d'Alene River which is about 20 feet to the right. August 7, 2003

Description of dredging at Cataldo

Excerpted from the RI - Part 4, CSM Unit 3

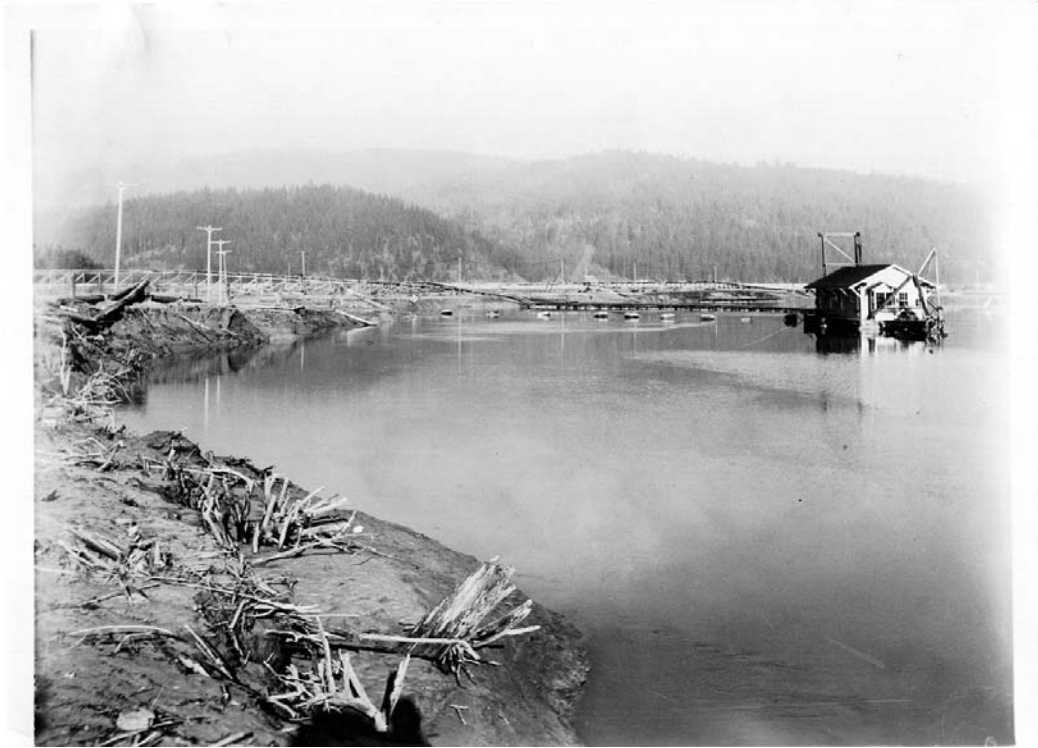
In July 1932, the mining companies responded by starting operations of a suction dredge system constructed below the Cataldo Mission. The dredge pumped water and fine tailings scoured from the river bottom to a dump area adjacent to the river. Water draining from the dump flowed through an area of swamps for about two miles before returning to the river system. W. L. Zeigler, of the Hecla mining company and designer of the dredge, claimed that water returning to the river was perfectly clear.

The dredge removed 750,000 tons of tailings and debris during the 1932 season, excavating the river channel for a length of approximately 1,000 feet. By the beginning of the 1933 season, the channel had again completely filled with tailings. In 1933, the dredge is reported to have removed 1,250,000 tons of tailings and other debris. In December 1933, the basin experienced its worst flood on record. This flood served to refill the excavated dredge area. The dredge operators were pleased with the stability of the tailings dump. Flood waters were reported to rise high enough to inundate the ground on which the tailings dump was located, but due to the width of the river bottom at that point, no perceptible current was generated and there was no erosion of the growing tailings dump. Zeigler concluded that the location of the Cataldo dredge was the first place below all of the mills where tailings could be safely impounded (Quivik 1999).

In 1933, the Coeur d'Alene River and Lake Commission presented its "Report and Recommendations" to the Idaho State Legislature. The report stated that the suction dredge in use would "result in a partial removal of mine slimes." The report also recommended that the mining companies use some other method than the river channel to transport mine slimes to settling beds. The report recommended that a pipeline or flume system be constructed along the entire length of the Silver Valley to carry slimes to Mission Flats. The Idaho Legislature accepted the report, but made no additional attempts to remedy the problem. The mining companies continued to rely on the dredge at Cataldo to justify dumping of mining slimes into the river (Casner 1989).

In 1951, an article in the Idaho Statesman reported that the tailings impounded by the Cataldo dredge covered an area of 2,000 acres at a depth of 25 to 30 feet. The operation of the Cataldo dredge continued until 1968 when federal regulations mandated that the mining companies discharge their wastes to settling ponds (Casner 1989).

The State of Idaho estimates that approximately 34.5 million tons of mixed alluvium and tailings were dredged from the river between 1933 and 1967 (SVNRT 1998). In the mid-1960s, the Idaho Department of Transportation (IDT) purchased approximately 1 million tons (3 percent) of the dredge spoils for use in constructing the roadbed of I-90 (Casner 1991; SVNRT 1998). Design drawings available from the IDT indicate that these materials were used mostly in building the access ramps near the Cataldo Mission. The location of dredge spoils, as determined by the USGS in 1999 (Bookstrom et al. 1999) is shown in Figure 2.1-1.



Cataldo dredge



Cataldo dredge discharge

Stop 4 Drive By:

Old Mission State Park

Cataldo Mission

Ancient Coeur d'Alene Tribal head, Chief Circling Raven, is said to have lived for 100 years, until about 1760. His head village was near the present site of Kingston, Idaho. His Indian power spirit was the Raven who circled overhead and told of nearby game, of approaching enemies, and of future events.

"THE VISION OF CIRCLING RAVEN AND THE COMING OF BLACKROBES"

Understanding changing times, Circling Raven had visions of the future and gave a prophecy of the coming of "black-gowned" men who would bring new religious powers to help the people against new diseases and against the new immigrant invaders. Circling Raven's son, Twisted Earth, carried on his father's quest, searching for the Blackrobe and for new spiritual powers.

In the early years of the 1840's, Jesuit priests, the "Blackrobes" came to the northwest, and to the Coeur d'Alenes. These priests aided the Coeur

d'Alenes in many ways, but also participated in diminishing the tribal presence in the region. In 1858 Lt. Colonel E.J. Steptoe marched soldiers from Fort Walla Walla northward, to quell settlers disputes with Indians over tribal lands. Native bands of the Spokane, and Palouse Tribes were joined by the Coeur d'Alenes and successfully routed Steptoe's men, killing many of the soldiers

'At first the Indians resisted the move, but finally gave in'

during the daylong battle. Lt. Col. Steptoe feared total defeat during the long night ahead in their camp. It was at the Jesuit's bidding that the Coeur d'Alenes allowed surviving Army forces to escape through the tribe's lines to avoid further bloodshed.

Yet, Lt. Colonel Steptoe was followed several months later by a vengeful Colonel George Wright who defeated the combined tribes. It was at Cataldo Mission where a

treaty was signed in 1858 promising the Coeur d'Alene Tribe future peace, provided that the tribe would return all booty captured from Steptoe's forces. The three other tribes suffered great retribution – Wright ordered the slaughter of more than 800 Spokane Indian ponies and the hanging of over 15 leaders of the Walla Walla and Palouse Tribes. All three tribes were never allotted land for any reservation (later, at Chief

Garry's pleading the Spokane Tribe was given land).

Built in 1853, Cataldo Mission was constructed



with large logs that were milled near the site. The tribe worked hard with the priests,

demonstrating the deep respect and the welcome they felt as they encouraged the priests to live among them. A self-sufficient agriculture-based community emerged and thrived for a short while; however, in 1877 the United States government informed the tribe that they now were relocated to lands far south of Lake Coeur d'Alene, to Desmet Idaho.

At first the Indians resisted the move, but finally gave in, physically leaving their special church and village. Never, however, was Cataldo far



Father Cataldo and five tribal members - 1926



Sketch of LOUISE SIUWHEEM, in front of historic Old Sacred Heart Mission of the Coeur d'Alene Tribe, 1850, near Cataldo, Idaho—Idaho's oldest building.
—by Coeur d'Alene artist, Lawrence Aripa, of Aripa Indian Arts, Plummer, Id.



Campaign to restore mission begins - 1926

from their hearts. After the tribe left the Old Mission, Father Cataldo made the church his

headquarters.

During this time mining pollution also began to move into the Coeur d'Alene River. Spring floods brought this pollution to the Cataldo floodplains.

In 1961 the mission was designated as a National Historic Landmark and in

1975 it became an Idaho State Park.

Cataldo Mission has held a place all of these years in the heart of the Coeur d'Alene Tribe. Tribal members have been buried on this ground. Each year the tribe gathers at the Mission on August 15th, to celebrate the "Feast of the Assumption" – and during the 2003 celebration the tribe offered up a deep prayer of thanksgiving for a long awaited event - the State of Idaho had returned ownership of the historic Mission to the Coeur d'Alenes.

In 1994, given the tribe's historic ties to this land and the pollution existing at the site;

especially in the picnic areas, the Coeur d'Alene tribe initiated a cleanup at the site.

Lead and other metals were at unsafe concentrations. Approximately two feet of contaminated soil was removed from the site.

Clean soil was then placed over the underlying contaminated sediment. The land was then seeded with grass.



Photo: Ridolfi Engineers

Top Photo: Crews carefully remove contaminated soil from around the base of trees at Cataldo in 1995. Bottom Photo: Large scale soil removal around picnic grounds before 1996 recontamination floods.

Unfortunately, upstream sources of metals continue to move downstream and Cataldo continues to be subject to routine flooding. In 1996, one such flood recontaminated the remediated site. Although not contaminated as much as it was historically, this site is nonetheless a prime example of land that will never be safe. We, the tribe, and those who visit our Mission will perpetually be at risk.



Photo: GIS Dept.

Lawrence Aripa with traditional regalia and Father Connolly serving mass.

Box Drive Bys:

Smeltonville Flats,
Hillsides Revegetation,
Location of Former Smelter Complex



BEIPC

Basin Environmental Improvement Project Commission

1005 W. McKinley, Kellogg, Idaho 83837

(208) 783-5781 • FAX: (208) 783-4561 • <http://www.basincommission.com> • info@basincommission.com

Bunker Hill Superfund Site

Situation Summary Cleanup at the Bunker Hill Superfund Site included:

- Remediation of 2068 residential properties, 170 commercial properties, and 262 right of ways
- Demolition of Bunker Hill complex (lead smelter, zinc plant, phosphate fertilizer plant and concentrator)
- Excavation of 1.5 million cubic yards of mine tailings in Smelterville Flats
- Capping the Central Impoundment Area, CIA
- Re-vegetation of the hillsides

Blood lead levels in area children, once among the highest in the country, are at the national average. Lead in house dust has dropped from 10,000 parts per million (ppm) in the mid 1970's to approximately 400 ppm in 2002. Although exposure has been reduced through removals and capping, contaminants remain throughout the site which requires long-term management. The Institutional Controls Program (ICP) operates as a locally-enforced set of rules and regulations designed to ensure the integrity of clean soil and other protective barriers.

Brief Timeline:

- | | |
|---------|---|
| 1916 | Bunker Hill lead smelter constructed |
| 1973 | A fire in the baghouse at the smelter compromises the pollution control system; operation of the smelter continues. Blood lead for children is 65 ug/dl in Smelterville, and 40 ug/dl for the site-wide average. [CDC now recommends less than 10 ug/dl.] |
| 1983 | Screening results determine that 25% of the children living near the smelter have high blood lead levels; Area is placed on the National Priorities List (NPL). |
| 1985 | Bunker Hill Superfund Task Force is formed. |
| 1989 | A Human Health Risk Assessment determines house dust and yard soil are the primary sources of lead exposure in children. |
| 1990 | Gulf Resources (smelter operator) declares bankruptcy. The remaining Potentially Responsible Parties (PRPs) agree to conduct a residential yard cleanup program in the populated areas. EPA and the State of Idaho direct cleanup of the nonpopulated areas. |
| 1994 | Upstream Mining Group takes over the yard removal program. |
| 1995 | Demolition of smelter. Cleanup of non-populated areas begins. Phase I efforts emphasize the prevention of human exposure to contaminated soil and the reduction of metal loads to surface and ground water through source removal. [Phase II efforts will address ground water goals in the future.] Institutional Controls Program is implemented. |
| 2000 | Milo Creek project completed to prevent flooding and recontamination of remediated areas. |
| Present | Institutional Controls Program is on-going. Panhandle Health District continues to provide education, sampling assistance, clean soils, removal for small projects, and operation of disposal sites. |



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Smelterville Flats

Situation Summary

EPA and State of Idaho removed 1.2 million cubic yards of tailings from the Smelterville Flats. Groundwater and surface water wetland treatment systems as called for in EPA's Superfund Record of Decision, ROD, were ruled inadequate and were not built.

Remedial Actions

- Dust Control during remediation and re-vegetate for long term barrier and erosion control.
- Placed Clean Topsoil over areas where contaminants remained and where material was too coarse to support vegetation.
- Graded remaining sediments to create functional Natural Wetland and Floodway. Some natural wetland re-vegetation has occurred. Monitoring will continue to determine water quality improvement.
- Removed 300,000 cubic yards of Tailings south of I-90.
 - West End: Removal depth 5 to 10 feet, disposal in CIA, re-graded with clean soil and re-vegetated.
 - East End: No removal because soil was above the water table and capped or in use by industrial businesses. Surface water improvements were conducted to minimize tailings infiltrations.
- Floodway Improvements included grading riverbanks, armoring the lower bank with riprap, armoring upper bank with riprap or growth media and live branch plantings, constructing spillways, sills, low flow channels, an overflow channel, and re-seeding topsoil across the Flats.
- Control of Runoff in areas expected to be paved south of I-90. Minimize infiltration and percolation into underlying contaminants to reduce the potential for metals leaching into groundwater. Regrade. Construct a swale and drain to transport stormwater to a sedimentation pond.

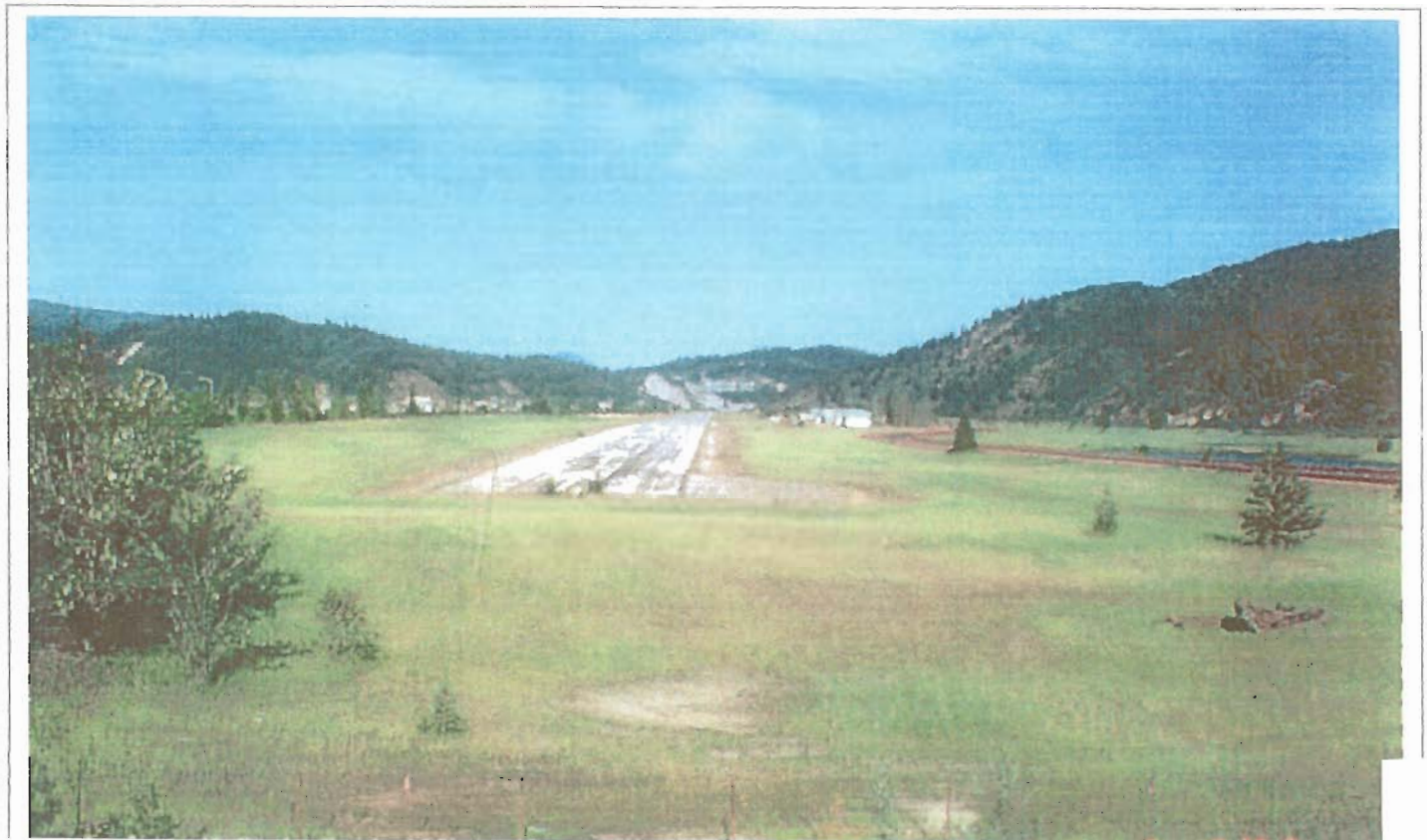
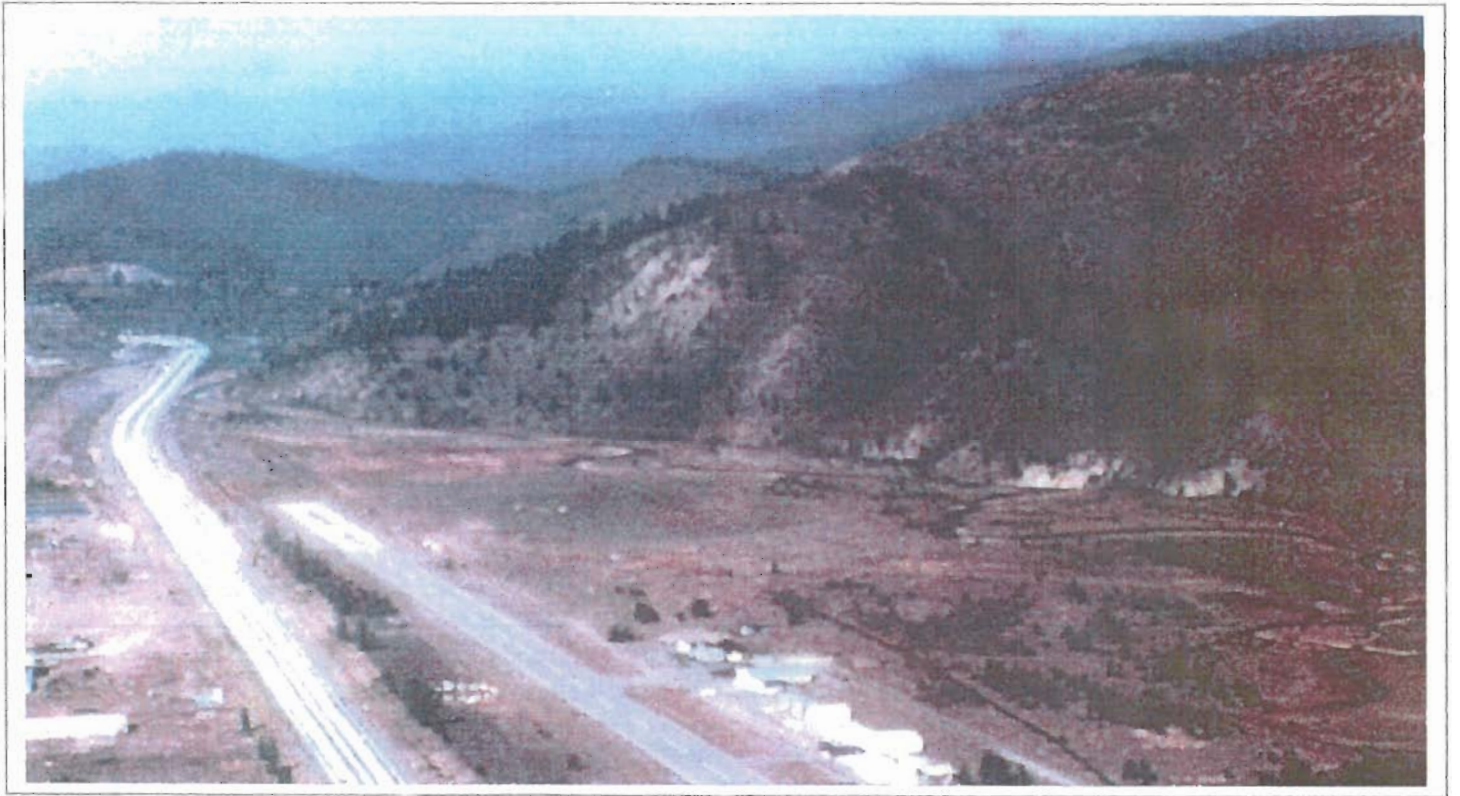
Special Area Management Plan (SAMP)

A plan is being created to establish common understanding of remedial actions, future development, floodplain function, and to establish a streamlined permitting process.

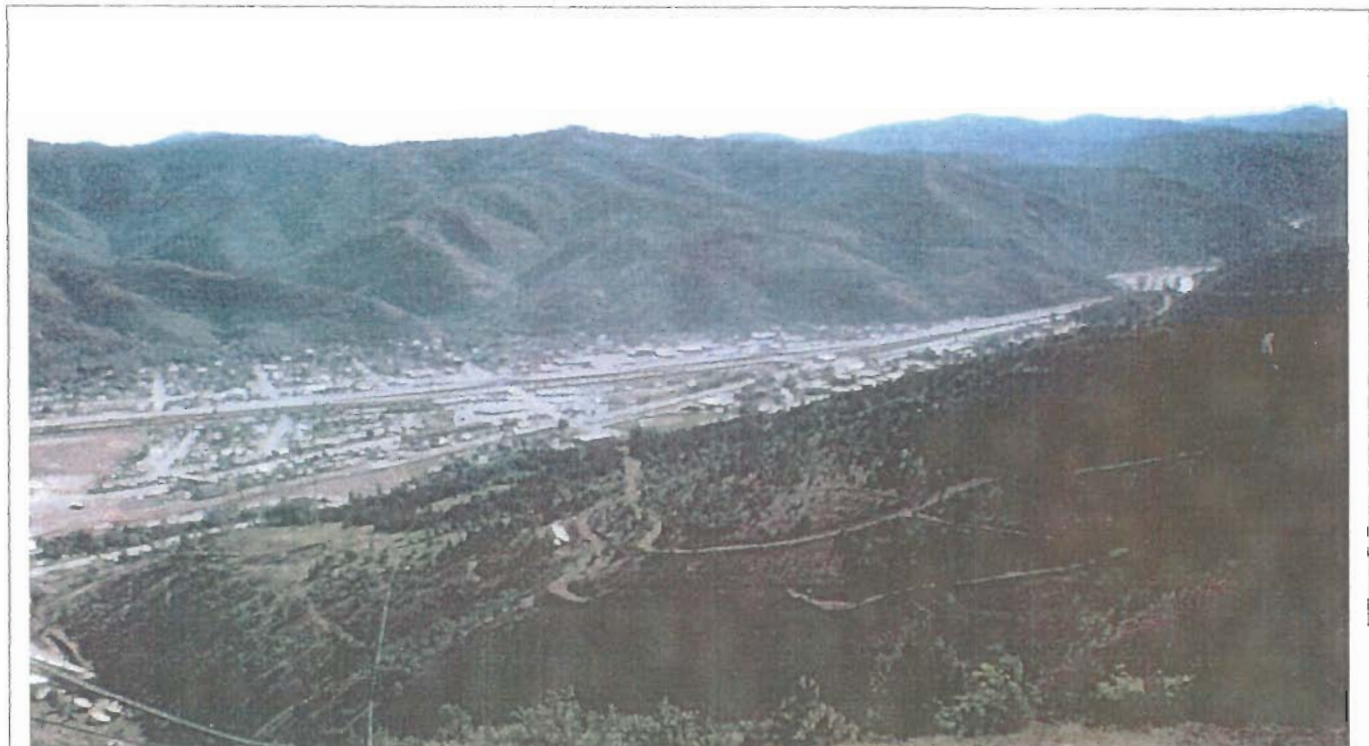
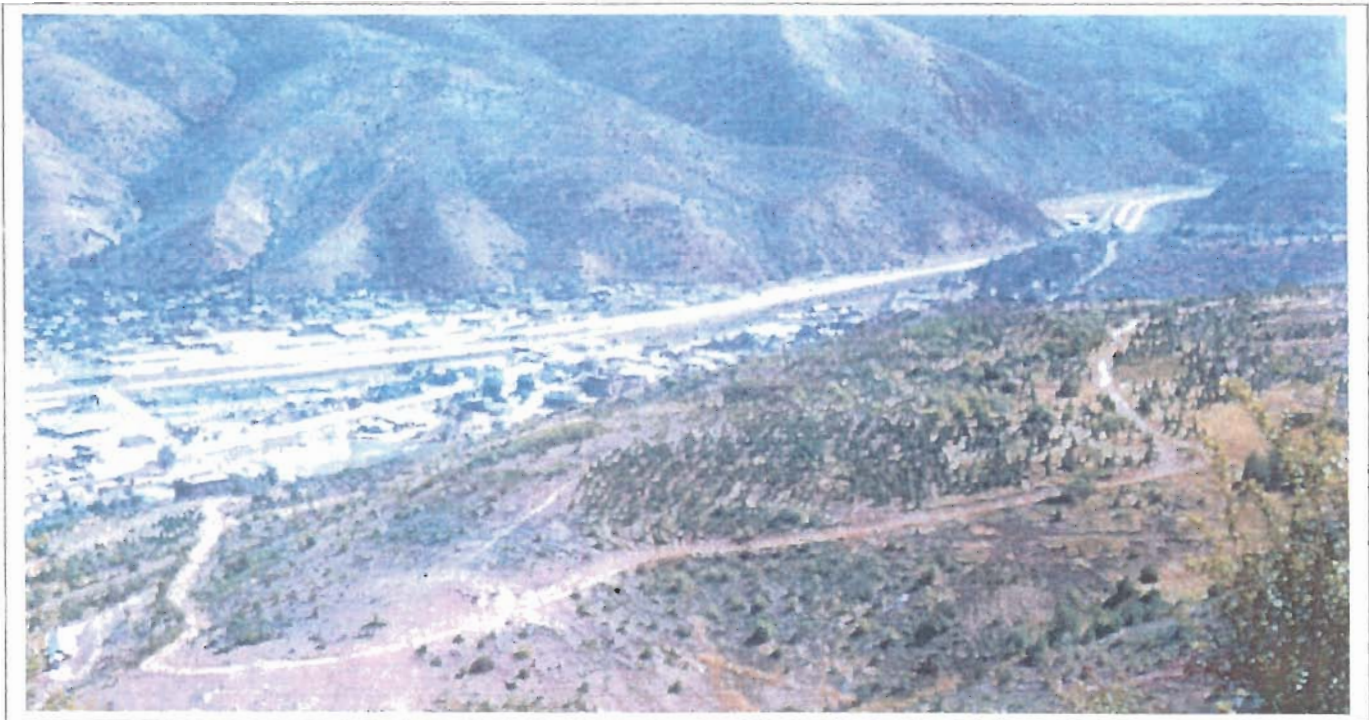
Work Remaining

Operation and Maintenance

Smelterville Airstrip
Before and After Remedial Action



Smeltonville
View from Brown's Ranch
Before and After Remedial Action

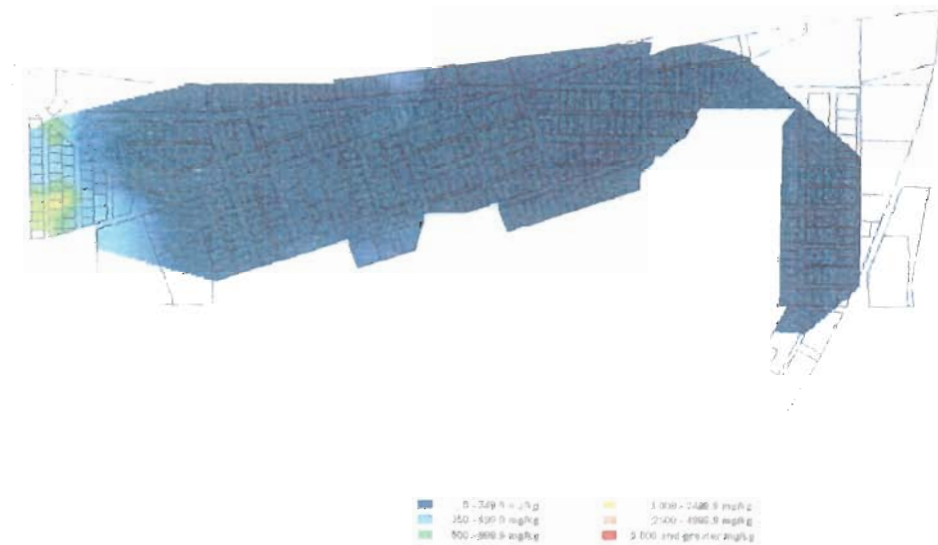


Soil Lead Concentrations in Smelterville Before and After Cleanup

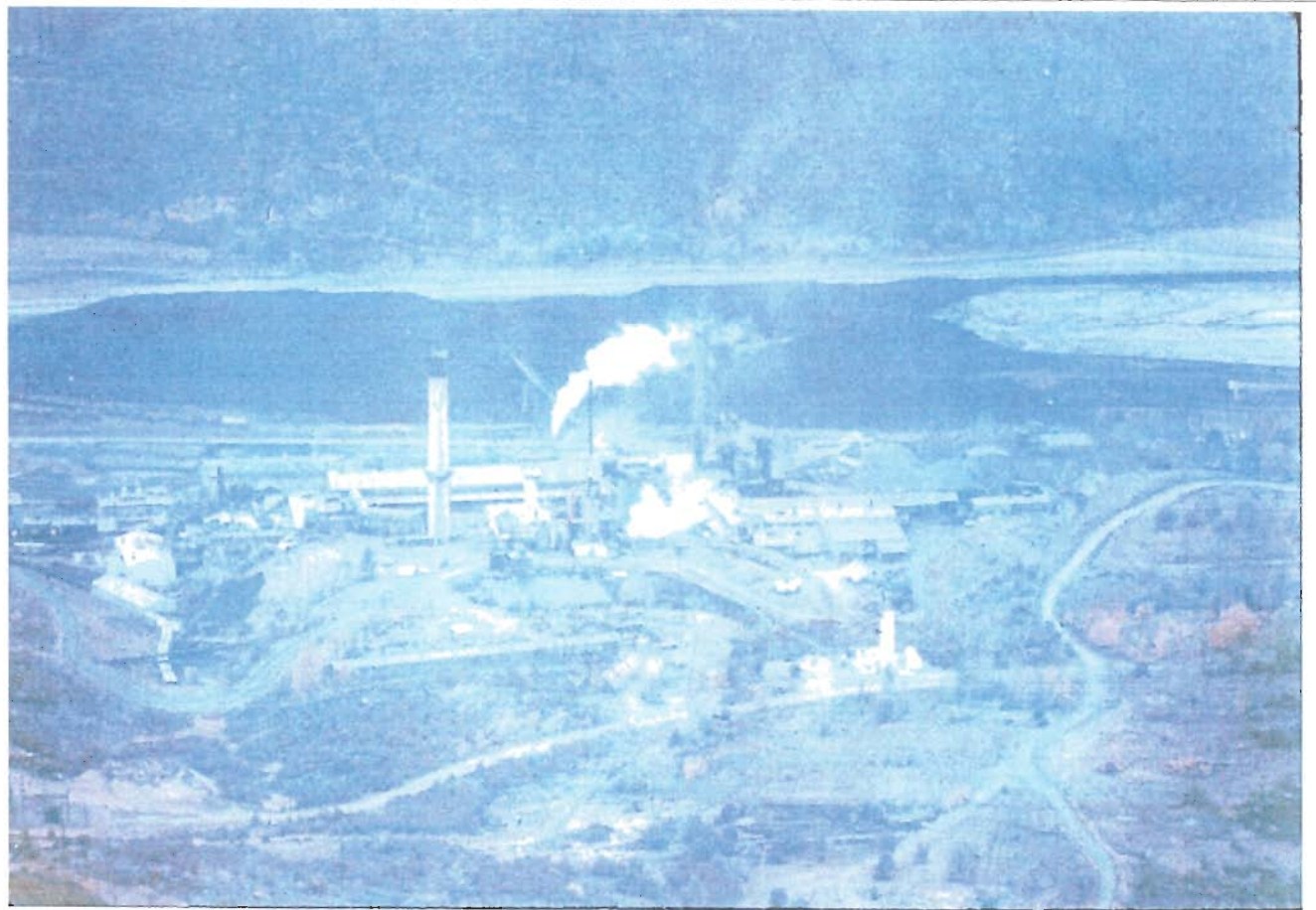
1989



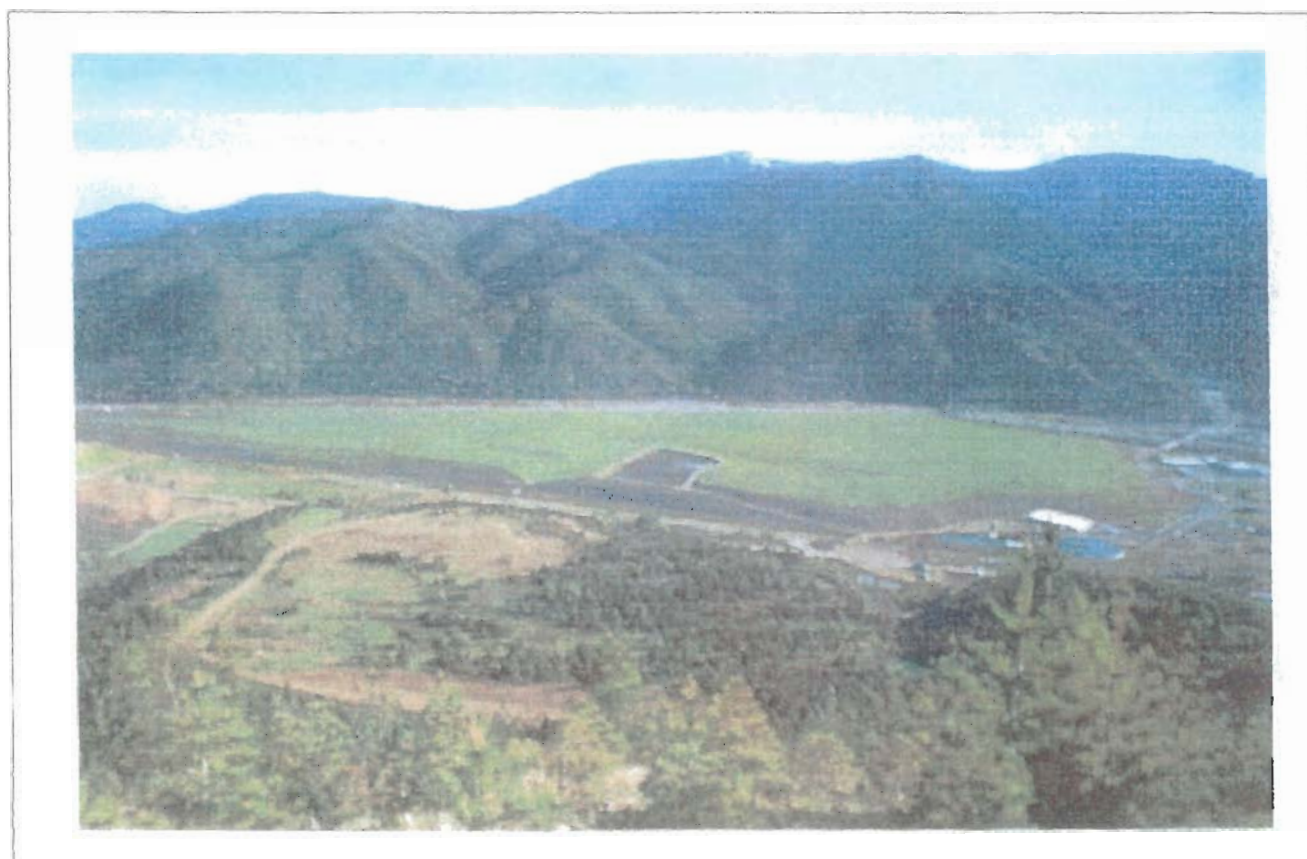
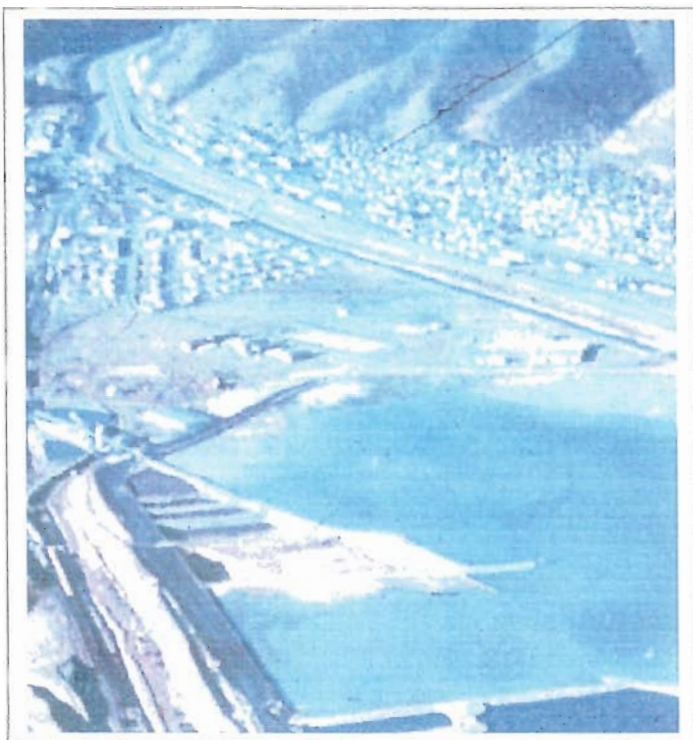
1997



Smelter Plant in operation and
After Remedial Action



Central Impoundment Area
Before and After Remedial Action



Bunker Hill Superfund Site Hillsides Revegetation Project

The southern Bunker Hill hillsides environment dominates the viewshed of the municipalities of Kellogg and Smelterville, Idaho. Revegetation of these hillsides is important to the ecological and aesthetic environment of the Silver Valley. The hillsides, which occupy the greatest land areas of any project at the Bunker Hill Superfund site, have been a historically important source of sediment and metals to the Coeur d'Alene basin. Stabilization of this resource and beginning its restoration is important to the long-term development of the valley.

The mining and metallurgical industry of the Silver Valley brought jobs and prosperity to the region, but simultaneously subjected the hillsides and the surrounding landscape to many decades of sulfur and metal emission and deposition. Several forest fires moved through the general area, including the great 1910 fire and a smaller fire in 1931. These events destroyed much of the timber cover between Government Gulch and Milo Gulch to the east. This fire, combined with the depositions noted above, resulted in chronic, broad scale denuding of the landscape surrounding the industrial facilities, from the early 1930s to the present. The loss of vegetation, combined with the naturally steep slopes of the hills, resulted in high level soil erosion which contributed large quantities of sediment to the Coeur d'Alene River basin.



Figure 1. Pre-treatment hillsides environment in Government Gulch. Note construction of terrace benches spaced approximately 30 m apart. Steep slopes, exceeding 30 degrees (58 percent) and extending to over 500 meters in many places, dominate the site. Combined with extensive soil erosion, acidic reaction, and even steeper cut and fill slopes, the hillsides landscape is a difficult restoration challenge (1997).

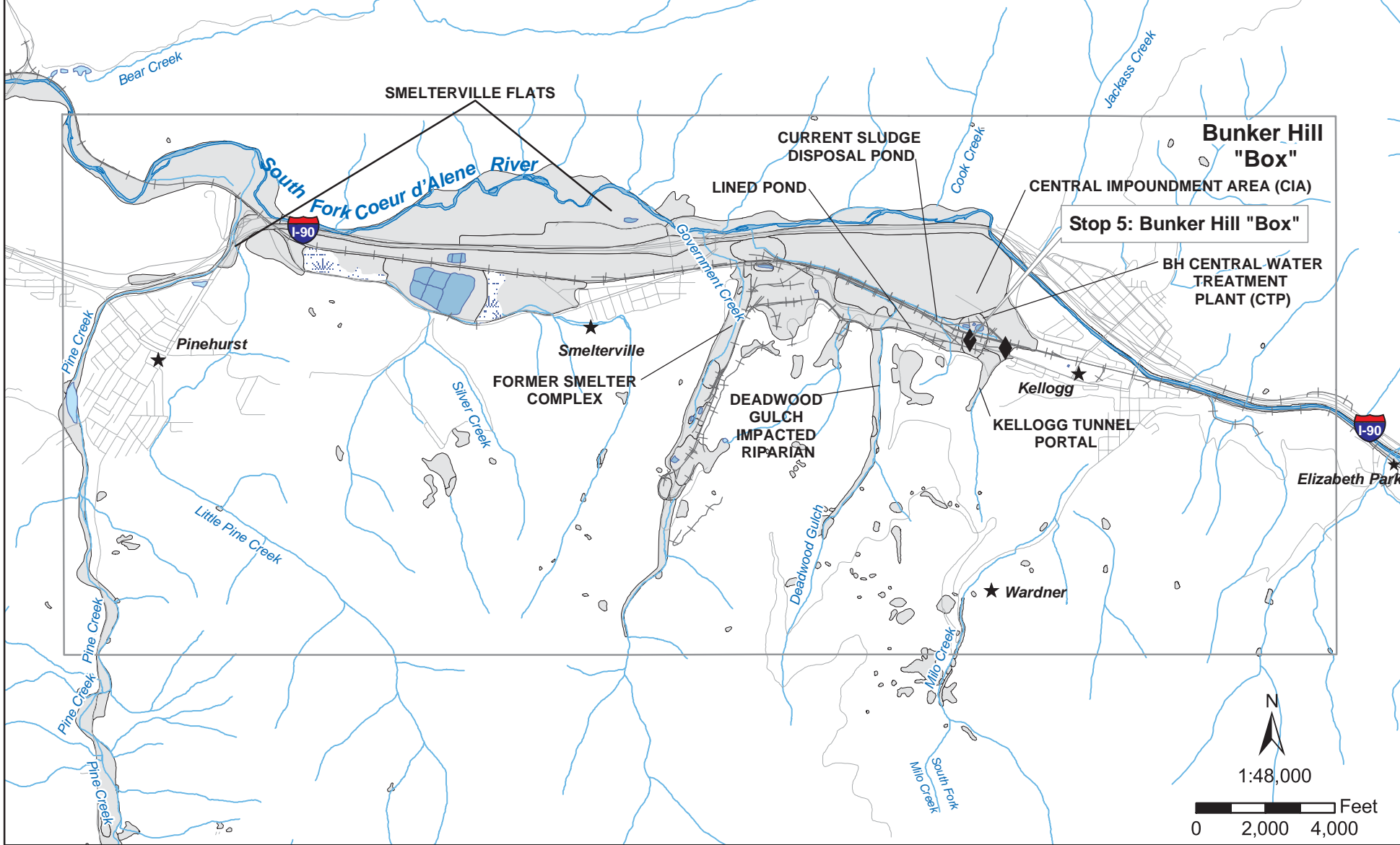
Numerous attempts at revegetation the hillsides have occurred. Work initially focused on tree planting, and bench terracing to reduce erosion. In total, approximately 2 million trees were planted on the general Superfund site including the hillsides. Species planted included western white pine, douglas-fir, ponderosa pine, western larch, and lodgepole pine. Active hillsides restoration from 1998 to the present included development and installation of site prescriptions using adaptive management and monitoring of results. The hillsides have received various soil amendments such as mulch, fertilizer, lime, tackifier, organics and seed in order to promote vegetation. The Hillsides have responded well to these treatment and successional process appear to be been re-initiated. Monitoring of the hillsides occurs on an annual basis to measure success and identify areas that may need additional treatments.

Target plant covers for the program were 50 percent or greater and overall plant canopy cover in 2003 exceeded 65 percent. Areas of low cover are often composed of rock pavement surfaces. New seedling are emerging and volunteer plant species are appearing on the slopes. Turbidity of surface water emanating from the hillside watersheds has dropped substantially from past years. Instantaneous comparisons between background and turbidity at the mouths of Government and Deadwood creeks indicate that State of Idaho water quality standards are being met in most cases. Early successional precesses appear to be emerging on the hills with assistance provided by wildlife.

EPA contact: Bill Adams (206) 553-2806

Government Gulch
Before and After Capping and Revegetation





Legend

- ◆ NAS Tour Site Stop
- ◇ NAS Tour Drive by
- ★ Cities
- ⬮ Upper Basin Watershed Boundary
- BLM Mine Sites

- Roads
- Railroad / Rails to Trails
- ~ Streams
- Rivers
- Lake
- Wetland
- Marsh

Bunker Hill Box – Non-Populated Areas Summary of work completed:

Smelterville Flats - located on the north of Smelterville on the north side of the freeway

In the 1997/98 construction seasons, the South Fork Coeur d'Alene River was diverted and 1.3 million cubic yards of contaminated tailings were removed from the 200 acre area. Once tailings removals were complete, clean backfill was hauled in and the 2.5 mile stretch of river was reconstructed. This area, which had previously been barren and dusty is now a thriving and reconstructing floodplain.

Smelter Demolition/Closure - located within the gate of Bunker Hill on the south side of the road and appears as a grassy hill

The zinc and lead smelters, acid plants and fertilizer plants and all other associated buildings (roughly 200 structures) of the Bunker Hill Mining and Metallurgical Plant were demolished and buried at the lead smelter site in the Smelter Closure landfill. This landfill covers approximately 30 acres and in one part, the cell is completely lined to accommodate the principal threat materials (as identified in the ROD—eg, Pb above 84,000 ppm). The landfill was covered with PVC, soil and then seeded. The landfill closure was completed in 1998.

Gulches - Government Gulch is just outside the west gate and runs up Government Gulch road. The old zinc plant was up in this gulch. Magnet gulch is in the middle of the site with a large canyon-like excavation on the south side of McKinley Avenue. Deadwood Gulch is the largest gulch at the east side of the fenced Bunker Hill site.

We removed about 900,000 cubic yards of contaminated soils from Government Gulch and Magnet Gulch from 1997 through 1999. After removal, the stream channels were reconstructed (as they had been diverted/filled for mining operations over the past 100 years). Contaminated soils were buried in the smelter closure.

Hillsides Revegetation (see separate sheet for more info)

The bare, steep, rocky and acidic hillsides at Bunker received various soil amendments such as mulch, fertilizer, lime, tackifier, organics and seed in order to promote vegetation. About 1000 acres were targeted. Growth on these hillside areas is monitored annually and so far the results are showing extremely good growth and regeneration.

Union Pacific Railroad Right-of-Way located along Bunker Creek to south of McKinley Avenue

The seven-mile stretch of right-of-way located within the “Box” was remediated by Union Pacific and completed in 2000. Cleanup included removal of contaminated materials and capping. The City of Kellogg sponsored a rails-to-trails effort and paved a recreational trail through the area.

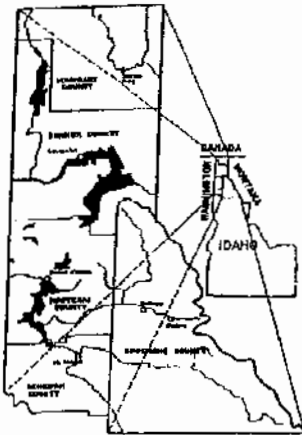
Central Impoundment Area

The CIA is a 260 acre tailings impoundment that has received about 21 million cubic yards of mine waste since its development in 1928. Historically, this unlined facility was used to dispose of acid mine drainage from the Bunker Hill mine. The Central Treatment Plant was constructed in 1974 and the impoundment was no longer used for acid mine drainage disposal, but was used as a holding pond for the acid drainage since the plant operated in batch mode. In late 1994, EPA received the Central Impoundment Area and the Central Treatment Plant (among other

properties) through bankruptcy of the responsible parties. EPA constructed a lined pond to store acid mine drainage prior to treatment at the plant in order to eliminate using the unlined Central Impoundment Area. In 1999 and 2000, the impoundment was capped with a low-linear density polyethylene liner. By eliminating the addition of acid mine drainage to the impoundment and capping, EPA and the State expect to see reductions in metal loading from this area. EPA and the State are monitoring groundwater and surface water throughout the system in order to evaluate cleanup of the impoundment seeps. Over the years, the seeps have largely disappeared as surface expressions and the original remedy may no longer be adequate in addressing seeps.

Milo Creek

Milo Creek headwaters are above an old mine dump and several mine adits. This upper portion of Milo is thought to be hydraulically connected to the Bunker Hill Mine. EPA and the State have spent considerable effort in the main stem Milo drainage building high-water infrastructure and stabilizing the huge mine dumps.



PANHANDLE HEALTH DISTRICT I

114 West Riverside Avenue
Kellogg, Idaho 83837-2351

Environmental Health
Vital Statistics
Home Health
WIC Clinics
Health Education
Family Planning
Well Child Conference
VD Clinics
Early and Periodic Screening
Immunizations

Institutional Controls Program
Lead Health Program
Phone: (208) 783-0707
Fax: (208) 783-4242

INSTITUTIONAL CONTROLS PROGRAM

The Institutional Controls Program (ICP) is a locally enforced set of rules and regulations designed to ensure the integrity of clean soil and other protective barriers placed over contaminants left throughout the Bunker Hill Superfund site. The ICP also provides education, sampling assistance, clean soils for small projects (less than one cubic yard of material), pickup of soil removed from small projects and a permanent disposal site for contaminated soils generated site wide. The ICP also regulates and provides assistance with construction and renovation projects on building interiors that involve ceiling and attic work, insulation removal, and work in dirt basements and crawl spaces.

The fundamental purpose of the ICP is to protect the public health and assist local land transactions within the Superfund site.

Project documents required to link the ICP to existing local building departments and land use planning activities include:

Panhandle Health District (PHD)

- Contaminant Management Rules
- Barrier Design/Permitting Criteria

Local Government

- Ordinance requiring PHD sign off on building permits
- Ordinance amendments to Comprehensive Plans and Zoning Regulations
- Model Subdivision Ordinance
- Handbook of Best Management Practices for Storm Water Management and Sedimentation Control
- Road Standards & Design Criteria

BUNKER HILL SUPERFUND SITE



INSTITUTIONAL CONTROL PROGRAM

INSTITUTIONAL CONTROLS PROGRAM

WHAT IS IT?

The Institutional Controls Program (ICP) is a locally enforced set of regulations designed to ensure the integrity of clean soil and other protective barriers placed over contaminants left in place throughout the Bunker Hill Superfund Site.

PURPOSE:

To protect the public health and assist with local land transactions within the Superfund site.

HOW IT WORKS:

All excavation and grading construction and certain interior remodeling projects proposed for any land or structure within the boundaries

of the Superfund site must have an approved permit(s) from Panhandle Health District (PHD) and other permit authorities which have jurisdiction over land use issues.

The PHD permit must be issued and valid before any work permit issued by any other entity is valid.

All contractors involved in excavation and grading construction and certain interior remodeling projects within the site must be licensed by PHD.

There are no fees associated with contractor licensing or work permits.

ICP SERVICES

EDUCATION:

Supply information on where contaminants are and how to avoid exposure. Give advice on how to break existing barriers and how to select and install new ones.

SAMPLE ASSISTANCE:

Identify areas of concern that may need to be sampled and provide information on land use vs. barrier durability.

PHD will collect samples and provide sample analysis where appropriate.

CLEAN SOILS:

Provide clean soils to site residents for small projects involving the removal of less than one cubic yard of material.

DISPOSAL:

Provide a site for disposal of contaminated soil and debris generated by excavation, demolition and/or construction activities sitewide.

CONTRACTOR LISTING:

Maintain a list of contractors licensed to perform work regulated by the ICP.

TRACK PROJECTS:

Establish and maintain a record of construction activities by property. This information will be available to assist with land transactions within the Bunker Hill Superfund Site.

OTHER PAMPHLETS AVAILABLE:

Barrier Option Plan
Soil Disposal
Large Projects - Exterior
Small Projects
Contractor Licensing
Building Renovation-Interior Projects
Building Demolition
Health & Safety
Interior Projects

For more information contact:

Panhandle Health District
114 W. Riverside Ave.
Kellogg, ID 83837-2351

Phone: 208-783-0707
FAX: 208-783-4242

SUPERFUND

Fact Sheet

BUNKER HILL "BOX"

Kellogg, Idaho



U.S. ENVIRONMENTAL PROTECTION AGENCY

March 2003

Bunker Hill "Box" Cleanup Update

Residential Cleanups Continue, Upgrades Planned for Central Treatment Plant

Active cleanup of metals contamination in the 21-square mile area known as the Bunker Hill "Box" is nearing completion. The work remaining in the Box includes completing cleanups at about 500 residential properties, upgrading the Central Treatment Plant, and capping a few other small contaminated properties. This fact sheet summarizes accomplishments at the site to date, recaps what happened in 2002, and summarizes the work planned for 2003.

Yard Cleanups on Schedule

Despite a rocky start, cleanup of residential properties stayed on schedule last year. EPA and the State of Idaho stepped in and cleaned up 78 properties at a cost of \$2.8 million. The Upstream Mining Group (UMG) completed 108 properties. EPA and the State of Idaho are committed to keeping yard cleanups on schedule again this year. We expect that 200 properties will be cleaned up with a focus on finishing all the yards in South Kellogg. In April we will know whether UMG plans to fulfill its Consent Decree obligations or whether they will only conduct a portion of the work.

In total, we estimate that 500 residential properties still need to be cleaned up in the Box. At the current pace, all yards will be completed by 2006. Some additional sampling may be needed to determine the exact number of remaining properties. Once the yards in South Kellogg are complete this year, residential areas still needing cleanup will include: Wardner, Elizabeth Park, Ross Ranch, Page and Montgomery Gulch.

What Else Did We Do in 2002?

Besides keeping yard cleanups on schedule, EPA spent an additional \$2.8 million on other projects in the Box in 2002, including approximately:

- \$1.2 million on operating and maintaining the Central Treatment Plant;
- \$700,000 on capping, fencing and revegetation work along McKinley Avenue and the bike path;
- \$150,000 on basic infrastructure work (road maintenance, erosion control, flood repair work in government gulch);
- \$400,000 on grading, covering and revegetating the Borrow Area Landfill. The landfill is now closed and has been seeded.
- \$360,000 on hillside revegetation.

What Else Is Happening This Year?

★ ★ ★ ★ ★ ★ ★ ★ ★ ★

Badly Needed Upgrades Get Underway at Central Treatment Plant

This year at the Central Treatment Plant, EPA will focus on the work needed to keep the aging facility functioning and prevent failures which could result in huge discharges of contaminated water to the South Fork.

EPA plans to spend about \$5 million in 2003 on the following work at the plant:

- Creating more storage capacity for mine water by cleaning out the lined pond and creating storage inside the mine;
- Upgrading the lime-feed system at the plant;
- Replacing the instrumentation and controls system;
- Installing a generator as a backup power supply;
- Repairing corrosion and the rotating arm in the sludge thickener.

If additional monies become available, EPA would also like to begin the needed work to stop surface water from entering the mine during storms. This will greatly reduce the amount of contaminated water coming into the plant requiring treatment. Other work needed at the plant includes installing filters on the treatment system and improving the in-mine pumping system so that the water storage system in the mine is more reliable.

Frequently Asked Questions:

Q. What is EPA doing about the seeps from the Central Impoundment Area (CIA)?

A. EPA and the State of Idaho are monitoring the water seeping from the CIA. Much less water is seeping from the CIA since the cap was completed two years ago and the seeping water is much less contaminated than it has been historically. The cap is preventing water from entering the impoundment and percolating through the waste.

Any water seeping from the CIA now is water that was already in the CIA before the cap was installed. Because no additional water is entering the CIA, the seeps are expected to dry up in five years or so. We will continue to monitor the water level within the CIA and the amount of contamination in the seeps.

Site Background

Bunker Hill was added to the National Priorities List (Superfund) in 1983. The 21-square mile area around Kellogg was divided into two operable units for the purpose of cleanup: the Populated Area encompassing the residential areas, and Non-Populated Area containing the smelter complex, the tailings impoundments, hillsides and other areas.

The Record of Decision (ROD) for the Populated Area was signed in 1991 and the ROD for the Non-Populated Area was signed in 1992.

EPA conducted Five-Year Reviews for these operable units in 2000. By the end of 2001, EPA had spent approximately \$130 million on the cleanup at Bunker Hill.

In addition, the governor's office reported to the 2003 legislature that environmental cleanup projects in the Silver Valley have contributed \$77.4 million to the state and local economy in wages, commercial property improvements, supplies and services, including \$500,000 in 2002 from state sponsored contracts.

Major Health and Environmental Improvements in the Box

Together, EPA, the State of Idaho, the mining companies and members of the communities have accomplished a huge amount of work in the Box. This work has resulted in great improvements in public health and the environment. With these accomplishments, the Box communities are now poised to rebuild the local economy. Below is a list of some of our major achievements:

- Greatly reduced children's blood lead levels. The average high in the 1970s was 40 micrograms of lead per deciliter of blood in children tested. In 2002, the average was 3.1 micrograms per deciliter.
- Nearly 2,100 Silver Valley residences have clean yards and safer homes.
- Approximately 1.25 million cubic yards of mine tailings – 300,000 truck loads – were removed from the Smeltonville Flats in the flood plain of the South Fork of the Coeur d'Alene River.
- Revegetated 1,000 acres of hillsides and 200 acres of flood plain, reducing erosion, reducing the scouring effect in the gulches and preventing recontamination.
- More than 400 commercial properties and rights-of-way have been cleaned up.
- The cleanup work in the town of Smeltonville is certified complete.
- Each year we are preventing approximately 1.25 tons of lead, 1,500 pounds of cadmium, and 390 tons of zinc from entering the South Fork of the Coeur d'Alene River by treating acid mine drainage at the Central Treatment Plant.
- Removed 900,000 cubic yards of contaminated material from Magnet and Government Gulches and re-established the natural creek channels in these areas; removed 300,000 cubic yards of contaminated material from the Arizona mine dump in Deadwood Gulch and revegetated the area.
- Provided \$2 million to the Milo Creek flood control project, stabilized the Reed Landing, and built a surface water overflow channel to handle large floods and prevent recontamination of clean areas.

Need More Information?

Review documents at the Kellogg and Pinehurst Libraries or on EPA's website: www.epa.gov/r10earth.

You can also call Angela Chung, EPA's Project Manager at 206-553-6511 or at 1-800-424-4372.

You can contact the Idaho Department of Environmental Quality at the Kellogg project office at 208-783-5781.



United States
Environmental Protection
Agency

Region 10 (ECO-081)
1200 Sixth Avenue
Seattle WA 98101

***SUPERFUND FACT SHEET
BUNKER HILL BOX UPDATE
Kellogg, Idaho
March 2003***

Stop 5 Drive By:

Eagle Crest Condominiums (see separate handout materials)

Stop 6: New Bunker Hill Mining Company Mine Site

Information will be provided at the stop.

**Repository Update
NAS Basin Tour
April 2004**

Background

- In the Summer of 2001, EPA initiated an effort to identify potential repository locations to support ongoing cleanup activity in the Coeur d'Alene Basin. This work was being performed while the Basin-Wide RI/FS and ROD were being developed.
- The 22-acre Lower Sunshine Tailings Pond (which operated from 1968-1979) was identified as a possible location and an agreement was entered into between EPA, IDEQ, and Sunshine Precious Metals, Inc. for the short-term use of this location as a repository (18 months from January 2002). The intention was for IDEQ to acquire the property once the design was completed and long-term costs/management issues were worked out.
- An initial site investigation was performed in the Fall of 2001 and data collection has been ongoing. A conceptual design analysis was completed in March 2002. Initial design projections forecast the potential capacity of approximately 200,000 - 400,000 cubic yards of material placement could occur at this location, although there were a number of technical issues that needed to be evaluated further prior to completing the design of the facility.
- Initial community outreach efforts were performed in May 2002 (this involved briefing Shoshone County Commissioners and conducting a door-to-door visit for nearby residents).

Summary of First Field Season (2002)

- The repository was operated in support of the 2002 field season from July through November 2002 in support of Basin-wide residential yard cleanups (received material from cleanup activities at 28 residential properties).
- In addition, the repository also supported a request by a "local government entity" for a disposal site for material that was to be generated by the expansion of the Wallace High School. This would normally have been addressed through an Institutional Controls Program, but given the fact that it

was still under development for the Basin, the Big Creek project managers elected to support the request.

- Approximately 21,360 cubic yards of contaminated soils and debris were placed in two different locations at the repository during the 2002 field season.

Summary of Second Field Season (2003)

- Property was acquired by IDEQ from Sunshine Metals Inc. in **July 23, 2003**.
- Site is now fully operational as the primary CDA Basin yard remediation repository.
- EPA/USACE managed repository during 2003 field season and will transition to IDEQ to lead in 2004 field season.
- Constructed upgrades to decontamination and dust control systems.
- Managed approximately 20,000 cubic yards of material (or 2000 trucks) during the 2003 field season. Primary source: approximately 90 properties (residential yards and right-of-ways) remediated under State-lead as part of human health remedy.

Path forward

- Repository design will be completed in early 2004 by USACE under joint EPA/IDEQ lead.
- IDEQ will hire and manage a contractor to operate repository starting in 2004.
- EPA will fund repository operations in 2004 and 2005 pursuant to agreement with IDEQ. After that, the funding source has not yet been determined.
- IDEQ is taking the lead in locating and siting of other repositories that are located in closer proximity to lower basin remedial actions and that will support ICP wastes that will be generated over the long-term maintenance of the barrier.

Community and Residential Remediation Program Coeur d'Alene Basin (Operable Unit 3) Record of Decision

Background

The Idaho Department of Environmental Quality (IDEQ) is the lead for implementation of the Operable Unit 3 (OU3) community and residential cleanup program. The program was approved by the Basin Environmental Project Improvement Commission in 2003, as part of its one-year and five-year workplans. The program elements are described in Section 12 of the OU3 Record of Decision.

Residential Sampling

IDEQ is sampling residential properties in the Basin, from Mullan to Cataldo and other areas in the Lower Basin, to determine if soil concentrations exceed action levels for lead or arsenic. Drinking water sampling also is provided for homes on private wells. Participation is voluntary and property owners are contacted to provide access for sampling their property. Priority is placed on sampling homes of expectant mothers or children under the age of 7; these properties are referred to as high-risk properties. Licensed daycare facilities and playgrounds also are considered high-risk properties. Sampling is performed based on a standard protocol and includes the yard, play areas, roadway shoulders, storage areas, driveways, gardens, and other areas such as adjacent commercial properties. The sampling results are provided to property owners, and remediation occurs based on sampling results.

Voluntary Participation

Residents are encouraged to call the Kellogg IDEQ office (208-783-5781) if they would like to have their yard sampled. There is no cost to homeowners. Residents are encouraged to call by September 15 to be included in this year's sampling season.

Residential Remediation Goals for 2004

- The goal is to remediate 300 residential properties this year.
- Remediation will continue to prioritize high-risk properties.

Residential Yards

Residential soils between 700 to 1,000 mg/kg lead receive barrier enhancement (primarily sod or gravel). In general, residential yard soil with concentrations above 1000 mg/kg lead or 100 mg/kg arsenic will be removed to a depth of one foot, backfilled with clean soil, and revegetated with sod. Homeowners are supplied with instructions for maintenance and care of the new barrier to help ensure long-term performance.

Commercial Properties

In general, commercial properties will receive a 6-inch barrier. Commercial properties that are in close proximity to residential areas will be remediated to the same standard as residential properties. Excavation may be necessary to maintain grade and drainage. Parking areas will generally receive a 12-inch barrier.

Rights-Of-Way (ROW)

The rights-of-way will be remediated to match the adjacent residential property. If access is not restricted then the ROWs will receive a 6-inch barrier at a minimum.

Residential Water Supply

Private drinking water wells will be sampled and closed if the drinking water has more than 10 ug/L arsenic, 5 ug/L cadmium, or 15 ug/L lead. An alternate water supply will be provided for homes that exceed drinking water action levels by connecting residences to the existing water district supply, providing point of use treatment, or installing a new well.



BASIN BULLETIN

A Quarterly Review of Cleanup in the Coeur d'Alene River Basin

In This Issue:

New EPA Funding For Box and Basin

Cleanup Process Started For Lower Basin Rec Areas

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Calendar

Community Involvement Contact:

Renee Dagseth
206-553-1889

Subscriptions & Submissions

The Basin Bulletin can be sent to your email address as a pdf and/or Microsoft Word file. To request addition or corrections to the mailing list, or to make a submission to the Basin Bulletin, please contact:

Pamela Moore, 206-438-2236
pamela_moore@urscorp.com

EPA Provides New Funding For Box and Basin Cleanup

EPA recently provided \$17.7 million for cleanup activities in the Bunker Hill Box and Basin. These sites are two of only 11 new projects nationwide to receive funding for this year, indicating their high priority with EPA. Of that amount, \$10.2 million will be focused on human health cleanups in the Basin. That work will include cleanup of residential yards, community areas, and recreation sites along the Coeur d'Alene River. The State of Idaho is taking the lead for yard cleanups. EPA will take the lead on recreational area cleanups. In the Box, \$4.8 million will be used to continue yard cleanups, while \$2.7 million will be used to operate the Central Treatment Plant and maintain remediation in non-populated areas.

About 70 local employees have been hired to support "Box" yards cleanups. These positions are mostly full-time through the 4-month field season.

Most materials and services used on the Box yards projects are purchased locally, supporting many more local jobs.

Additional funding from EPA will allow the pace of cleanups in the Box to remain steady this year, despite limited participation from the Upstream Mining Group (UMG). The UMG is expected to clean up between 40 and 50 residential yards this year. EPA, in partnership with the US Army Corps of Engineers, will clean up 84 residential yards, 68 commercial properties, two street right-of-ways in South Kellogg, 33 street right-of-ways in Pinehurst, and the Kellogg Middle School and Teeter's Field.

The new funding for cleanup work in the Basin will be available once EPA and the State of Idaho sign a State Superfund Contract. Funds for work in the Box will be available immediately. If you are interested in contracting opportunities for the EPA cleanup work, please go to <http://yosemite.epa.gov/r10/cleanup.nsf/sites/bh>. Contractors may also contact the Idaho Department of Environmental Quality (IDEQ) Kellogg office for more information at 208-783-5781.

Cleanup Process Started For Lower Basin Recreation Areas

Planning work has begun for two Lower Basin recreational areas, as approved under the Basin Commission's (Commission) one-year workplan. The objective is to establish clean, low-maintenance recreational sites for public use. Included in this one-year remediation plan are:

- East of Rose Lake Boat Launch
- Hwy 3/Union Pacific Railroad trail access point
- RM 135 Long Beach/Springston.

Cleanup is not being planned for the RM 135 site due to site changes associated with recent installation of the Trail of the Coeur d'Alenes.

A Commission Project Focus Team (PFT) visited the East of Rose Lake and Hwy 3 sites this spring. The team's input was used to develop EPA's preliminary design (called the 30% design) that was then presented to the PFT/CCC group for review. A community meeting was held in late May to share information and gather feedback on the proposed projects. The PFT/CCC group provided comments on EPA's final draft design plan (called the 95% design plan) in late July.

Draft plans for the East of Rose Lake Boat Launch site include paving the dusty dirt parking lot (which has high metals concentrations), improving the boat launch, and stabilizing the eroding contaminated riverbank. EPA is preparing to put a clean cap of pavement and grass over the contaminated soil next to the parking lot. Picnic tables will be placed on the clean cap.

Construction activities to clean up the East of Rose Lake Boat Launch and Hwy 3/ UPRR access point could begin in fall 2003 or spring 2004. Schedules depend on resolution of various issues including signing of the State Superfund Contract.

One issue involves completion of the Historical Preservation Act review for the Rose Lake

Pioneer Schoolhouse, located on the property. Superfund cleanup monies cannot be spent on the building, and the Rose Lake Historical Society does not have the resources to take an active role in the school's future. Current plans are to place a fence around the building. There will also be an Endangered Species Act review of the project due to the presence of bull trout in the Coeur d'Alene River.

The PFT/CCC group has been developing recommendations for the Commission's five-year workplan. After reviewing available information on candidate sites, the group held a boat-based field trip on July 8 to evaluate the sites. A follow-up meeting was held on July 9 to develop a proposal for the five-year plan.



April 2003 Basin Commission Recreation Areas Project Focus Team field trip to discuss one-year design plans.

The Recreational Area PFT/CCC group is proposing that several Lower Basin recreational sites be cleaned up and informative signs be posted at several other sites where active remediation is not technically feasible or practical. The group also recommends that the Commission support establishment of a collaborative Lower Basin Recreational Management Plan.

Yard Sampling 2003

The High Risk Program will continue throughout the Basin this summer. This voluntary program samples soil around homes of young children (0-6 years in age) and expectant mothers in order to set remediation priorities for each year.

EPA and IDEQ are using several tools to raise public awareness about the program. IDEQ provides questionnaires to homeowners during neighborhood soil sampling to determine if young children or expectant mothers live in the home. EPA has funded announcements on KWAL radio and sent postcard announcements to more than 1,500 homeowners in the Basin.

For more information on the High Risk Program, please contact Jana McCurdy at IDEQ (208-783-5781) or Angela Chung at EPA (206-553-6511).

Basin Cleanup Coalition Supports Community Participation

The Basin Cleanup Coalition (BCC) will be hiring an independent technical advisor to help the community understand the Record of Decision. For more information on how you can join the BCC, contact Susan Scott at 208-664-3194, x160.

Comings and Goings

Please welcome **Ed Moreen**, formerly with the US Army Corps of Engineers, as the new EPA representative in the Coeur d'Alene Basin.

Ed is the local EPA point of contact and he is working with the Basin

Environmental Improvement Project Commission on cleanup projects in the Basin. A professional civil engineer, Ed had been engaged in the Corp's Bunker Hill cleanup efforts. The Union Pacific Railroad cleanup was his focus in recent years.

Fish Consumption Advisory Issued For Coeur d'Alene Lake

The Idaho Department of Health and Welfare and the Coeur d'Alene Tribe have issued a Fish Consumption Advisory for Coeur d'Alene Lake. For complete information go to:

http://www2.state.id.us/dhw/BEHS/fish_advisory_program/cda_lake.htm

or contact Aaron Scheff at the Idaho Department of Health and Welfare Bureau of Environmental Health and Safety, 208-334-0606 or 1-866-240-3553 (toll-free).

Ed is a native of Montana, has lived in Coeur d'Alene since 1995 and graduated from Washington State University. He enjoys skiing and fishing with his family in the Coeur d'Alene area. Ed can be reached at 208-664-4588.

Jana McCurdy of Kingston, Idaho is the new Idaho Department of Environmental Quality Community Liaison for the Basin. She will communicate with public officials, agencies, and local residents about remediation projects in the Basin and will work with the Citizens Coordinating Council (CCC) and the Technical Leadership Group of the Basin Environmental Improvement Project Commission.

Jana joined the CCC in December 2002 and is committed to fostering an open-minded and productive working-group that represents all views within the Basin. She earned her master's degree in Human Factors Psychology from the University of Idaho and has done research in emergency management, group planning techniques, subjective risk assessment, and problem solving.

Jana can be contacted at mjmccurdy@imbris.com or Superfund Project Office, 1005 McKinley Avenue, Kellogg, Idaho 83837, 208-783-5781.

Information Repositories

North Idaho College Library
1000 Garden Avenue
Coeur d'Alene, ID 83814
208-769-3355

Wallace Public Library
415 River Street
Wallace, ID 83873
208-752-4571

Harrison City Hall
100 Frederick Street
P.O. Box 73
Harrison, ID 83833
208-689-3212

Spokane Public Library
906 West Main Avenue
Spokane, WA 99201
509-444-5336

EPA Field Office
1910 Northwest Boulevard,
Suite 208
Coeur d'Alene, ID 83814
208-664-4588

EPA Seattle Office
Superfund Record Center
1200 Sixth Avenue
Seattle, WA 98101
206-553-4494

Websites

EPA Coeur d'Alene Basin

[http://
Yosemite.epa.gov/R10/
CLEANUP.NSF/sites/cda](http://Yosemite.epa.gov/R10/CLEANUP.NSF/sites/cda)

Basin Environmental Improvement Project Commission

[http://
www.basincommission.com](http://www.basincommission.com)

Technical Leadership Group (TLG)

[www.basincommission.com/
TLG.asp](http://www.basincommission.com/TLG.asp)

Citizens Coordinating Council (CCC)

[http://
www.basincommission.com/
CCC.asp](http://www.basincommission.com/CCC.asp)

FAQs

Frequently Asked Questions

Q . What is the status of the National Academy of Sciences (NAS) study?

A . The NAS is currently forming the Review Committee to review the “scientific and technical practices” behind the remedy selected in the Coeur d’Alene Basin Record of Decision (ROD), at the request of the Idaho Congressional delegation. The Review Committee will visit the Coeur d’Alene Basin at a date to be determined and will hold a public meeting. The NAS expects to issue a report on its findings in June 2005. For more information on the NAS study, visit their website at www.nationalacademies.org and choose “Current Projects.”

New Look For EPA’s “Box” And “Basin” Websites

The EPA Bunker Hill "Box" and "Basin" websites have changed! Beth Kunz, Region 10's Superfund Webmaster, has made them more user-friendly and attractive. Less scrolling and more flexibility is the result. Check out the "breadcrumbs" at the top of each page. They allow you to identify where you are in the EPA website and how you got there. These new sites comply with the Americans with Disabilities Act, Section 508, which requires improved accessibility by those with vision impairments.

To view the website, please go to:

www.epa.gov/r10earth/bh.htm

and choose “Bunker Hill Box” or “Coeur d’Alene Basin” in the left blue bar. If you had bookmarked

the old website, you'll need to update your bookmark with the new address. Beth and the rest of the Coeur d’Alene team welcome your feedback on the new site. Please use the "Contact Us" link that appears toward the bottom of the left blue bar.

Calendar of Events

Basin Environmental Improvement Project Commission (Commission)

Contact: Luke Russell, 208-783-5781

Basin Commission Board

August 27, 2003 – 9:00 a.m.-3:00 p.m.

Health & Welfare Bldg., Wildcat Way, Kellogg

Citizens Coordinating Council (CCC)

Date, Time and Place To Be Announced

Please see the Basin Commission’s website at:

www.basincommission.com

Other Citizen Group Meetings

Coeur d’Alene Basin Citizens Advisory Committee (CBCAC)

Contact: John Snider, 208-664-9773

Shoshone Natural Resources Coalition (SNRC)

August 12 & 26; September 9 & 23, 2003

Contact: Connie Fudge, 208-753-6022

Group meets second and fourth Tuesday of each month from 11:30 a.m. to 1:30 p.m. at the Brooks Hotel – 500 Cedar Street, Wallace, ID

Silver Valley People’s Action Coalition (SVPAC)

Contact: Barbara Miller, 208-784-8891
PO Box 362, Kellogg, ID 83837

Washington Citizens Advisory Committee (WCAC)

Contact: Lloyd Brewer, 509-625-6968

Board of Directors Meeting

August 11; September 8, 2003

Board meets 2nd Monday of each month from 6 to 8 p.m. at Spokane County Water Works Bldg. – 914 E. North Foothills Drive, Spokane

General Membership Meeting

Date, Time and Place To Be Announced

Contribute to the Basin Commission Online Forum

The Basin Environmental Improvement Project Commission’s (BEIPC) Online Forum is up and running and ready for your input. Go to:

www.basincommission.com

and click on “Forum.”

Basin Commission Contacts

Basin Environmental Improvement Project Commission (Commission) – Sherry Krulitz, Chairperson

Commission Members

Allred, Steve; IDEQ Director	Phone: 208-373-0240	FAX: 208-373-0417	sallred@deq.state.id.us
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Iani, John; EPA Region 10 Administrator	Phone: 206-553-1234	FAX: 206-553-1809	iani.john@epa.gov
Krulitz, Sherry; Shoshone County Commissioner	Phone: 208-752-3331	FAX: 208-753-2711	commsec@co.shoshone.id.us
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Panabaker, Dick; Kootenai Cty. Commissioner	Phone: 208-769-4450	FAX: 208-667-8534	kc@co.kootenai.id.us

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Johnson, Jeff; U.S. Forest Service	Phone: 208-765-7442	FAX: 208-765-7307	jkjohnson@fs.fed.us
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Werner, Terry; City of Post Falls	Phone: 208-777-9857	FAX: 208-773-0549	twerner@postfallsidaho.org
Woods, Paul; U.S. Geological Survey	Phone: 208-387-1353	FAX: 208-387-1372	pfwoods@USGS.gov
Zilka, Nick; IDEQ	Phone: 208-783-5781	FAX: 208-783-4561	nzilka@nidlink.com

(*Core BEIPC Staff)

TLG Project Focus Team (PFT) Leads

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Biostabilization – Anne Dailey	Phone: 206-553-2110	FAX: 206-553-0124	dailey.anne@epa.gov
Human Health/Recreation – Anne Dailey	Phone: 206-553-2110	FAX: 206-553-0124	dailey.anne@epa.gov
Human Health/Residential – Rob Hanson	Phone: 208-373-0290	FAX: 208-373-0417	rhanson@deq.state.id.us
Lake Monitoring – Phillip Cerner	Phone: 208-660-8144	FAX: 208-686-5222	philc@cdatribe-nsn.gov
Streambank Stabilization – John Roland	Phone: 509-625-5182	FAX: 509-456-6175	jrol461@ecy.wa.gov
Streambank Stabilization – Nick Zilka	Phone: 208-783-5780	FAX: 208-783-4561	nzilka@nidlink.com
Upper Basin Source Areas – Bill Adams	Phone: 206-553-2806	FAX: 206-553-0124	adams.bill@epa.gov
Water Treatment/Canyon Creek – Bill Adams	Phone: 206-553-2806	FAX: 206-553-0124	adams.bill@epa.gov
Water Treatment/Mullan I/I – Luke Russell	Phone: 208-783-5781	FAX: 208-783-4561	lrussell@nidlink.com

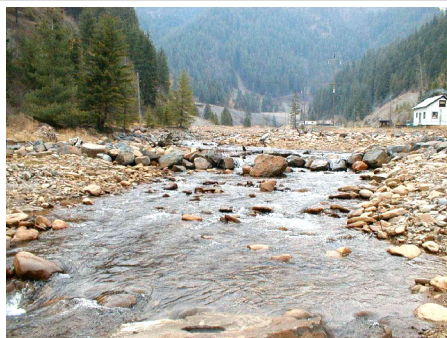
CCC Project Focus Team Volunteer Leads

Human Health/Recreation – Connie Fudge	Phone: 208-753-6022	FAX: 208-556-2025	fabfudge@imbris.com
Human Health/Residential – Connie Fudge	Phone: 208-753-6022	FAX: 208-556-2025	fabfudge@imbris.com
Lake Monitoring – Kristy Reed Johnson	Phone: 208/777-1588	FAX: 208/777-1615	kristyr@earthlink.net
Streambank Stabilization – Toni Hardy			rogntonihardy@aol.com
Water Treatment – Richard Costa			



United States Environmental Protection Agency, Region 10
Community Involvement and Outreach
1200 Sixth Avenue, ECO-081
Seattle, Washington 98101-1128

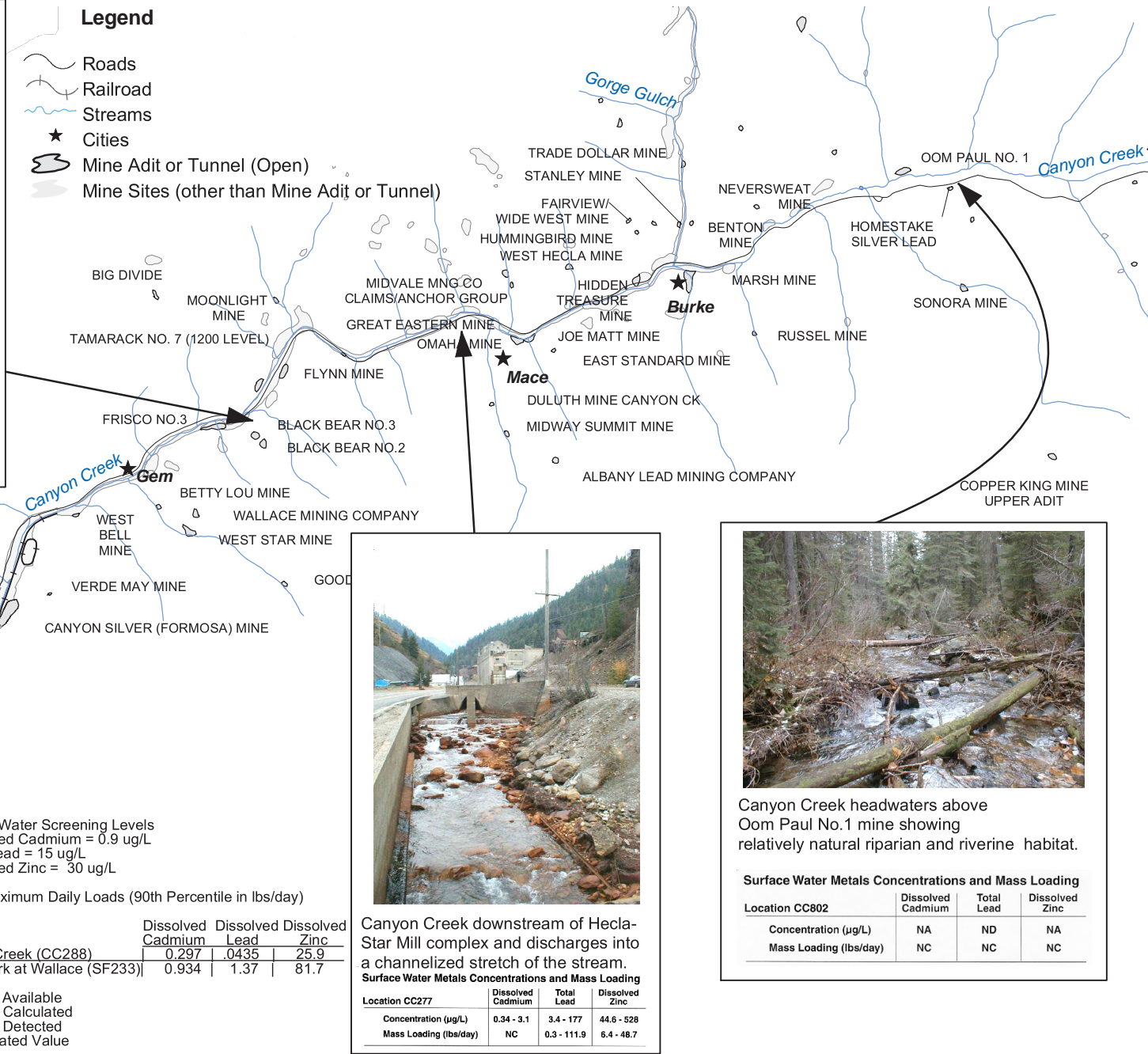
Bunker Hill and Upper Basin
Quarterly Newsletter
Coeur d'Alene, Idaho



Canyon Creek at Black Bear mine site showing little riparian vegetation and modification of streambed structure (e.g., grading, excavation of pools, and man-made structures) associated with tailings removal actions.

Surface Water Metals Concentrations and Mass Loading

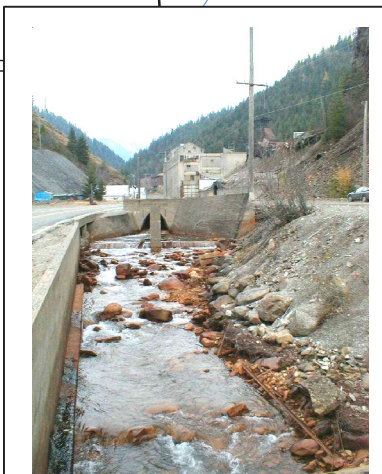
Location CC281	Dissolved Cadmium	Total Lead	Dissolved Zinc
Concentration (µg/L)	1.5 - 6	16.9 - 31.9	219 - 881
Mass Loading (lbs/day)	NC	1.1 - 32.2	40.2 - 364.7



- 1) Surface Water Screening Levels
 Dissolved Cadmium = 0.9 ug/L
 Total Lead = 15 ug/L
 Dissolved Zinc = 30 ug/L
- 2) Total Maximum Daily Loads (90th Percentile in lbs/day)

	Dissolved Cadmium	Dissolved Lead	Dissolved Zinc
Canyon Creek (CC288)	0.297	.0435	25.9
South Fork at Wallace (SF233)	0.934	1.37	81.7

NA = Not Available
 NC = Not Calculated
 ND = Not Detected
 J = Estimated Value



Canyon Creek downstream of Hecla-Star Mill complex and discharges into a channelized stretch of the stream.

Surface Water Metals Concentrations and Mass Loading

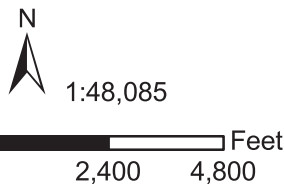
Location CC277	Dissolved Cadmium	Total Lead	Dissolved Zinc
Concentration (µg/L)	0.34 - 3.1	3.4 - 177	44.6 - 528
Mass Loading (lbs/day)	NC	0.3 - 111.9	6.4 - 48.7



Canyon Creek headwaters above Oom Paul No.1 mine showing relatively natural riparian and riverine habitat.

Surface Water Metals Concentrations and Mass Loading

Location CC802	Dissolved Cadmium	Total Lead	Dissolved Zinc
Concentration (µg/L)	NA	ND	NA
Mass Loading (lbs/day)	NC	NC	NC



Canyon Creek Water Treatment

Situation Summary

Canyon Creek is essentially devoid of fish below Burke as a result of high metals concentrations and severely degraded riverine and riparian conditions. Canyon Creek has historically contributed more dissolved metals load to the South Fork than any other tributary, approximately 20 to 25 percent of the load in the South Fork at its confluence with the North Fork. Cleanup of individual sources in Canyon Creek would be very difficult, costly and time consuming. The goal of EPA's Record of Decision, ROD, is to substantially reduce, by at least 50%, dissolved and particulate metals loads discharging from the creek into the South Fork. This goal would reduce the zinc loading to the South Fork by approximately 322 pounds per day. The Canyon Creek cleanup plan in the ROD involves stabilizing mine dumps and stream banks that are sources of sediment and particulate metals in the creek, and implementing a water treatment system near the mouth of Canyon Creek. EPA's goal is to identify a treatment system that would minimize long term O&M costs and meet the cleanup goals of the ROD.

One approach for Canyon Creek, described in the ROD, was to intercept the creek water in lower Canyon Creek and remove metals using passive treatment. Based upon EPA's current understanding passive treatment remains rather experimental and limited to relatively low flow-rates. The technology has never been applied to a high-flow situation as in Canyon Creek.

There appears to be promising new active technologies that would achieve the goals of the ROD at costs that are equivalent to those estimated in the ROD for a passive treatment system. One such system, which would be more efficient than that currently employed at the CTP, uses lime-stabilization/co-precipitation in combination with "high-speed ballasted-microsand separation technology." A key feature of this process is the elimination of the need for conventional large-scale clarifiers, potentially reducing treatment areas by a factor of 10. This would not only reduce capital costs for treatment facilities but also reduce the footprint of the treatment facility, which is an important consideration for siting.

Treatability Study

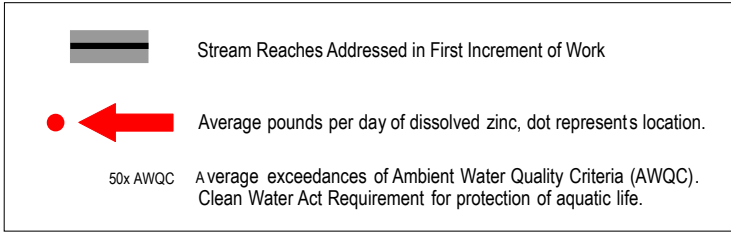
The ROD mandated a Treatability Study to establish the specific treatment technology. Water treatment technology assessments and pilot tests are proposed for the 5-year plan. This planning period will focus on developing the most cost-effective long-term solution to improving water quality from Canyon Creek. Current treatability testing will evaluate the effectiveness of a variety of combinations of lime stabilization, iron co-precipitation, polymer flocculation, and high-speed ballasted-microsand separation technologies for surface and groundwater. Lime-stabilization followed by water-solid separation using relatively low cost infiltration basins/ponds will also be considered.

Treatment Technologies Evaluation

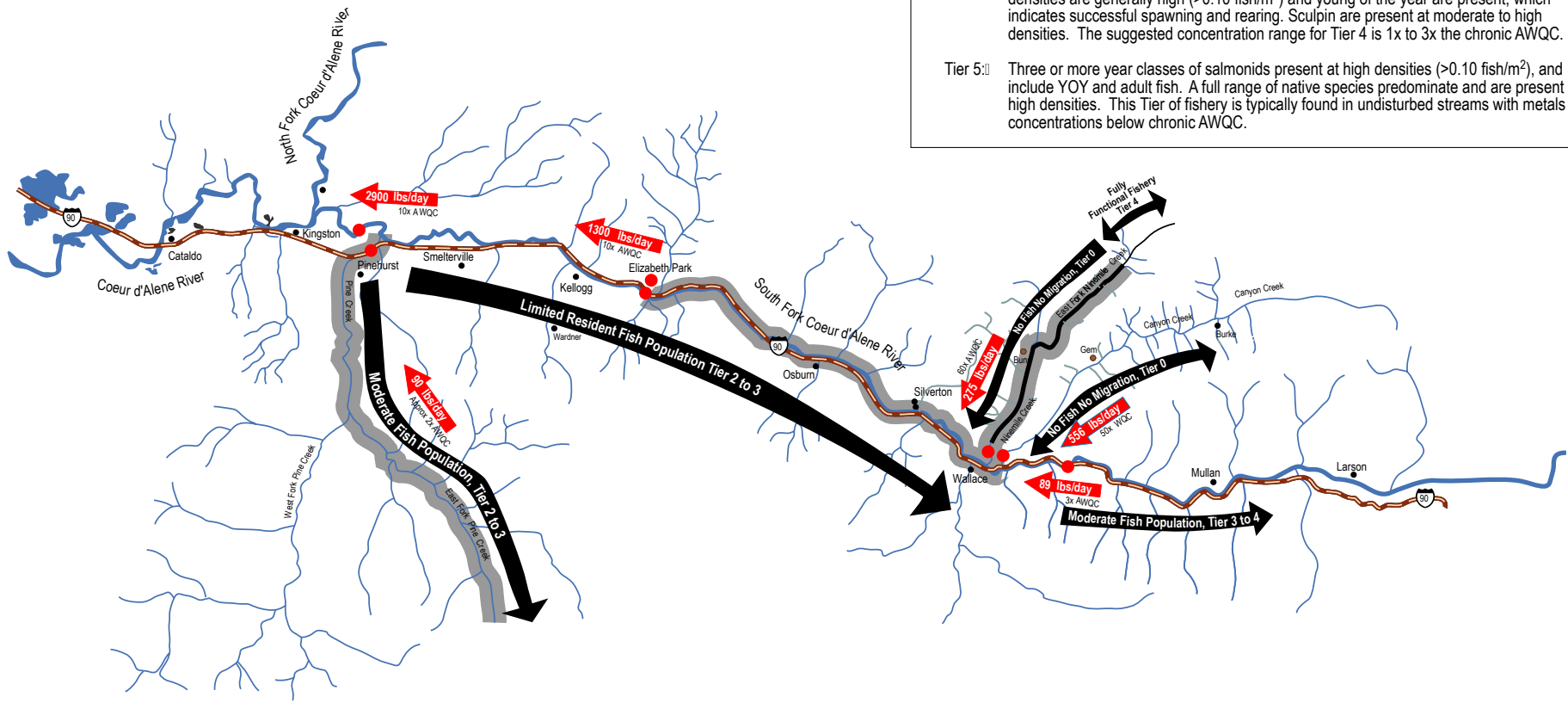
Through the Water Treatment Project Focus Team additional technologies will be evaluated. The outcomes of bench or pilot tests will be used to develop full-scale treatment designs. Consideration of hydrologic controls and innovative approaches to technology may be necessary to develop a cost-effective long-term solution.

Contact for More Information

Bill Adams (EPA), 206-553-2806



- Tier 0: □ No fish present.
- Tier 1: □ No resident fish are present. Adult and juvenile salmonids (trout species) transit occasionally to reach spawning and rearing areas. Suggested concentration range for Tier 1 is 10x to 20x the acute AWQC.
- Tier 2: □ Native or introduced salmonids (trout) are present, but with less than three year classes and generally low densities (less than 0.05 fish/ m²). Sculpins are generally absent, or present at very low densities. The suggested concentration range for Tier 2 is 7x to 10x the chronic AWQC.
- Tier 3: □ Three or more year classes of native or introduced salmonids are present. Trout densities are moderate to high (>0.05 fish/m²) and young of the year fish, representative of spawning and rearing, are present. Sculpin are generally absent or present at very low densities. The suggested concentration range for Tier 3 is 3x to 7x chronic AWQC.
- Tier 4: □ Three or more year classes of native or introduced salmonids are present. Salmonid densities are generally high (>0.10 fish/m²) and young of the year are present, which indicates successful spawning and rearing. Sculpin are present at moderate to high densities. The suggested concentration range for Tier 4 is 1x to 3x the chronic AWQC.
- Tier 5: □ Three or more year classes of salmonids present at high densities (>0.10 fish/m²), and include YOY and adult fish. A full range of native species predominate and are present at high densities. This Tier of fishery is typically found in undisturbed streams with metals concentrations below chronic AWQC.



Stop 9 Drive Up:

Burke & Canyon Creek Headwaters

Stop 9 Drive By:

Hecla Star Mine and Mill Site Examples



BURKE IDAHO

Historic mining activities in Burke, Idaho along Canyon Creek in early 1900's.