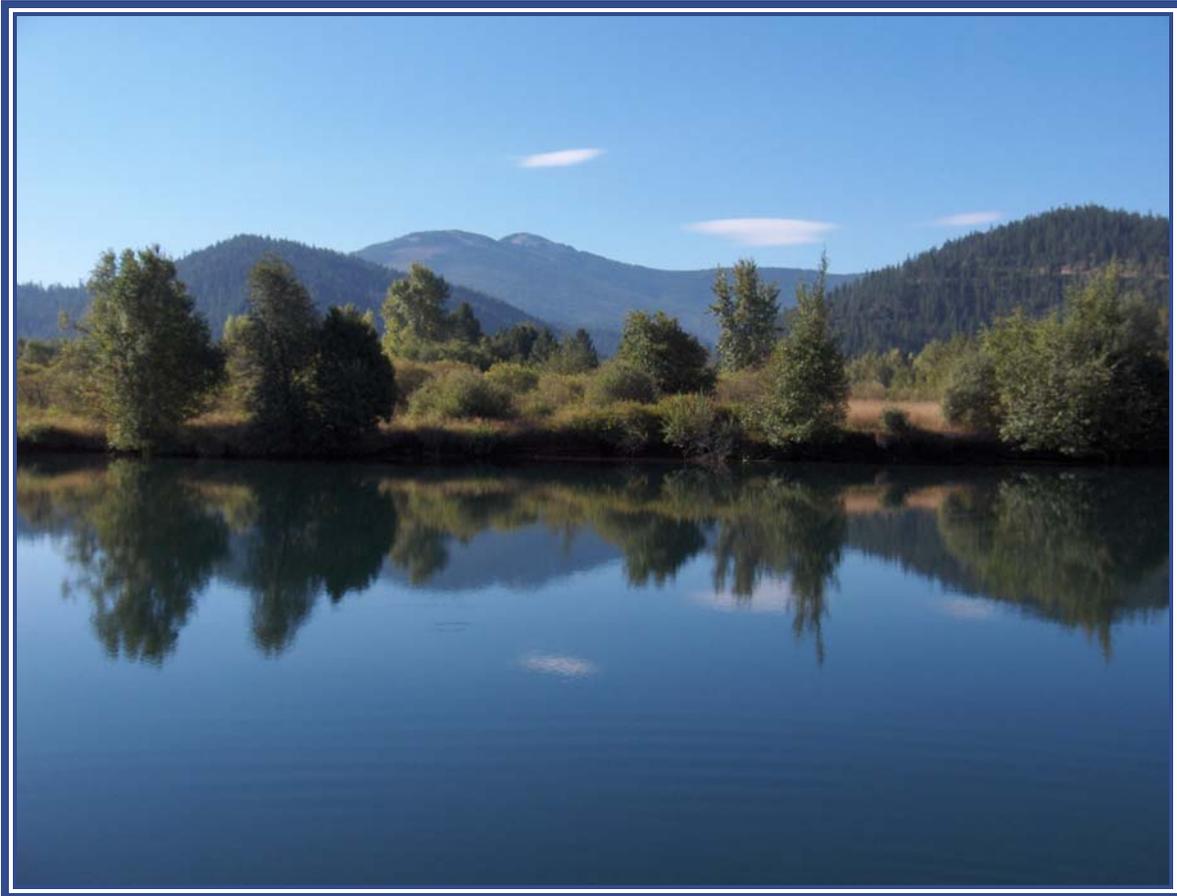


# 2005 ANNUAL REPORT



## *Basin Environmental Improvement Project Commission*

February 2006

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## **Work funded with Superfund or other cleanup funding:**

- Property Sampling and Remediation
- Water Treatment
- Mine and Mill Sites
- Recreation Areas
- Basin Environmental Monitoring
- Repositories

## **Work Funded Through Clean Water Act Grants:**

### **FY 2002 Grant Projects**

- Coeur d’Alene Lake Monitoring Program
- Bank Stabilization Demonstration Project
- Coeur d’Alene Lake Education Program
- Sewer Collection Study in Mullan (Inflow and Infiltration)

### **FY 2003 Grant Projects**

- Woodland Park Groundwater Quality Monitoring
- Meyer Creek Flood Assessment
- Upper East Fork Ninemile Creek Water Quality Evaluation
- Metal & Nutrient Removal Pilot Page WWTP
- East Fork Pine Creek Revegetation Pilot
- Inventory and Evaluation of Private Lands for Restoration of Wetland Habitats
- Fish Response to Bank Stabilization
- Sediment Transport and Bed Evolution Phase 1
- Coeur d’Alene Lake Response to Watershed Remediation Phase 1
- North Fork Coeur d’Alene River Hydrologic and Sediment Study
- Mica Bay Nutrient Reduction Project Phase 1
- Lower Lakes Aquatic Vegetation Survey
- Canyon Creek Groundwater Metal Source Characterization

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## **FY 2004 Grant Projects**

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Additional Water Quality Sampling in Selected Nearshore Areas

Plummer Wastewater Treatment Pilot

Plummer Creek Watershed Nutrient Load Assessment Modeling and Management Plan

Pinehurst Flood Impact Study

Silver Crescent Mine and Mill Complex Habitat Restoration

Canyon Creek Treatability Study

South Fork Sewer District Toxicity Reduction

Coeur d'Alene Lake Response to Watershed Remediation Phase 2

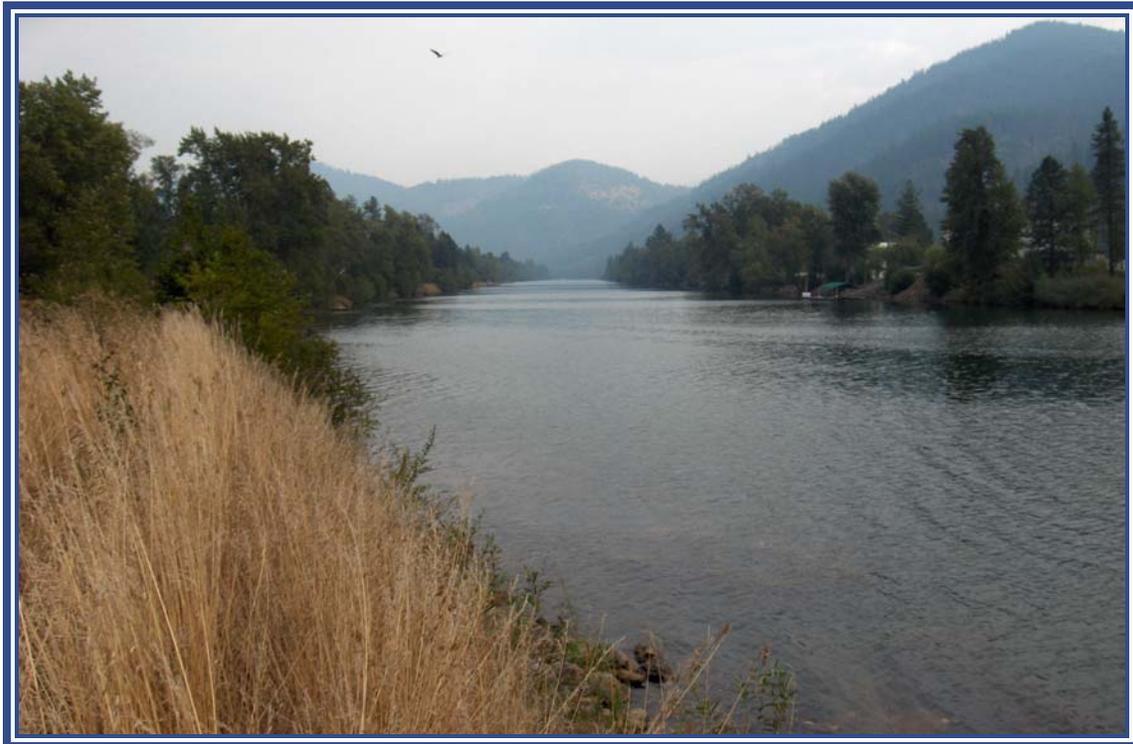
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## *Executive Summary*

The Basin Environmental Improvement Project Commission (BEIPC) is a locally based organization responsible for overseeing environmental cleanup to address heavy metal contamination, natural resource restoration and water quality in the Coeur d'Alene Basin (Basin). The BEIPC also participates in securing funding along with guiding and coordinating infrastructure upgrades and improvements to protect the environmental cleanup remedy and enhance living conditions in the communities of the Basin. The Basin is defined as the watersheds of the Coeur d'Alene River, Coeur d'Alene Lake and the Spokane River within the counties of Shoshone, Kootenai, and Benewah; as well as the Coeur d'Alene Tribal Reservation within Idaho.

During Calendar Year 2005, the BEIPC continued implementation of the 5 year operating plan; developed work plans for work funded through the Superfund, other cleanup appropriations, and Clean Water Act (CWA) Grants; and monitored project accomplishments by various implementing entities. CWA work was managed by BEIPC staff from grants made by the U.S. Environmental Protection Agency (EPA) to the State of Idaho Department of Environmental Quality (IDEQ) acting as the BEIPC fiscal agent.

## *BEIPC Overview*

### **Authorization and Duties**

The BEIPC was established by the Idaho State Legislature and implemented through a Memorandum of Agreement (MOA) among implementing parties to direct, and/or coordinate environmental remediation, natural resource restoration, and related measures to address water quality and heavy metal contamination in the Basin.

The Basin is considered to be Operable Unit 3 (OU-3) of the Bunker Hill Mining and Metallurgical Complex Superfund Facility, originally listed on the National Priorities List in 1983. Operable Units 1 and 2 (OU-1&2) are the populated, industrial, and undeveloped areas in what is known as the "Bunker Hill Box." The EPA and IDEQ are the implementing agencies for OU-1&2. This report also contains some information for OU-1&2 concerning activities in the property sampling and remediation section and the water treatment section.

The BEIPC's primary purpose is to work with the EPA and IDEQ to implement the Record of Decision (ROD) for OU-3 designed to advance the cleanup of heavy metals contamination throughout the Basin. In addition, the BEIPC is involved in:

- Implementing Phase II of the OU-2 remedy;
- Coeur d'Alene Lake management planning and implementation; and
- Heavy metal contamination cleanup efforts at mining sites in the North Fork of the Coeur d'Alene River.

Legislation creating the BEIPC authorized appointment of a seven-member board comprised of:

- Four members from Idaho, one representing the state, and one each representing the county commissions from Shoshone, Kootenai, and Benewah Counties, appointed by the Governor of Idaho;
- One representative of the state of Washington appointed by the Governor of Washington;

- One tribal council member of the Coeur d’Alene Tribe appointed by the council of the Coeur d’Alene Tribe; and
- One federal representative of the United States appointed by the President.

Implementing language directed the BEIPC to appoint an Executive Director to manage the activities of the BEIPC. The Executive Director is Terry Harwood.

**Current BEIPC Membership**

Name	Title	Representing
Sherry Krulitz, Chair	Shoshone County Commissioner	Shoshone County
Jack Buell	Benewah County Commissioner	Benewah County
Rick Currie, Vice Chair	Kootenai County Commissioner	Kootenai County
Chuck Matheson	Vice Chairman, Tribal Council	Coeur d’Alene Tribe
Jay Manning	Director, Washington Department of Ecology	State of Washington
Toni Hardesty	Director, Idaho Department of Environmental Quality	State of Idaho
Ron Kreizenbeck	Deputy Regional Administrator R-10 EPA	Federal Government

***Program Management***

The BEIPC is operating as envisioned by the Idaho statute and MOA between the governing entities. It is responsible for coordinating the activities of federal, state and local government agencies implementing the cleanup and restoration efforts and is also involved in the coordination of efforts to protect the cleanup remedies, human health, and the environment from the release and migration of contaminants through the establishment and implementation of an Institutional Controls Program (ICP) in the Basin. The BEIPC works with these agencies to establish annual work priorities and operating plans and provides project oversight and fiscal management for the CWA program through the office of its Executive Director and his staff. To assist the Executive Director in program management, planning, and implementation, volunteer staff “on loan” to the BEIPC from the states of Idaho and Washington, the EPA, and the Coeur d’Alene Tribe coordinate with the Executive Director and provide routine intergovernmental input on technical and policy issues. Other support groups include the Technical Leadership Group (TLG) and the Citizen Coordinating Council (CCC).

## **Technical Leadership Group (TLG)**

The TLG is the BEIPC primary technical advisory group. It is comprised of federal, state, local and tribal representatives who provide expertise in science, engineering, logistics, regulatory aspects, and land management in the Basin. The TLG advises the BEIPC on work planning and implementation while striving toward consensus-based recommendations. In 2005, the TLG developed the 2005-2009 five-year and Calendar Year 2006 work plans, reviewed and approved CWA project changes, final CWA project reports and deliverables, and studied and developed project and program proposals to implement the remedy in OU-2 and 3. The TLG is composed of representatives from 23 government entities. It is a large body, with a diverse range of backgrounds and experience, and has contributed thousands of professional and volunteer hours to advance Basin work.

## **Citizen Coordinating Council (CCC)**

The CCC serves as an information conduit to and from the BEIPC on citizen, community, and special interest issues, and on environmental cleanup and restoration concerns. It is comprised of diverse political and geographical representatives and was established to provide local citizen review and input on Basin related work to the BEIPC.

## **Community Involvement**

During Calendar Year 2005, the BEIPC continued to assure that its meetings and deliberations were open to the public and that the Basin web site, basincommission.com, was maintained and up-to-date. Meetings were held at various locations within the Basin with locations and dates posted in local newspapers and at the BEIPC office in Kellogg, Idaho.

## ***Coeur d'Alene Lake Activities***

The selected remedy for the Coeur d'Alene (CDA) Basin, OU-3, does not include Superfund remedial actions for Coeur d'Alene Lake (Lake). The State of Idaho and CDA Tribe have management responsibilities for the Lake. The OU-3 ROD anticipates that the State and Tribe, coordinating with federal agencies and local governments, will prepare and implement a CDA Lake Management Plan (LMP) outside of the Superfund process using separate regulatory authorities. One of the primary goals of the management plan is to control nutrient introduction and sediment metals mobilization and their effects on water quality in the lake. A lake management plan was prepared in 1995 and approved by many parties in 1996. BEIPC activities include funding a LMP Implementation Audit funded under a Clean Water Act sub-grant to determine how well the original LMP is being implemented. The State and Tribe are in the process of negotiating and preparing an updated plan to strengthen and update implementation of watershed-based environmental management efforts to reduce undesirable inputs of metals and nutrients to the lake.

During 2005, the Tribe and State provided numerous updates to the BEIPC on lake management activity. The BEIPC anticipates assisting the Tribe and State in coordinating implementation of the updated plan upon completion. In 2005, BEIPC and Clean Water Act sub-grant implementing agencies were involved in the following actions in support of lake management:

- Management of an intensive three-year environmental monitoring program to support lake management planning;
- Continued implementation of a pilot CDA River bank stabilization project to reduce the introduction of lead-bearing sediment into the Lake;
- Continued support and management of an educational program to improve public awareness of the Lake and its needs for continued protection;
- Continued implementation of a project to develop computer models to assess sediment transport and bed evolution in the lower CDA River;
- Continued implementation of a project to develop a simulation model to evaluate the Lake's response to watershed remediation;
- Implementation of a project to reduce nutrients entering the Lake from Mica Bay;
- Implementation of a project to survey aquatic vegetation in Benewah, Chatcolet and Round Lakes, tributaries to the Lake; and their potential impacts on the vegetation in the Lake;
- Implementation of a wastewater treatment plant pilot study for the City of Plummer to reduce nutrient loading to Plummer Creek and the Lake; and
- Implementation of a project to perform a nutrient load assessment and modeling to develop a management plan for Plummer Creek tributary to the Lake.



**Coeur d'Alene Lake**

## *Public Outreach and Citizen Involvement*

To encourage public participation in Basin improvement projects, the BEIPC issues news releases and posts announcements of its upcoming meetings to its web site. The public is invited to BEIPC and CCC meetings. General public comment opportunities are scheduled at each meeting.

### **CCC Meetings and Communication**

CCC meetings were held in January, April, July, and October 2005. All meetings were open to the public. At CCC meetings, members were updated on ongoing BEIPC and TLG activities and asked to provide input on a variety of issues. The CCC kept the BEIPC informed of its activities by providing meeting minutes and comments to commissioners prior to BEIPC meetings and by making presentations at BEIPC meetings. When appropriate, CCC comments were also provided to the TLG.

Approximately twice a month, CCC members were provided with email and/or U.S. mail updates on relevant activities in the Basin. CCC members were also routinely provided with notes from regular TLG conference calls.

### **Chronology of Citizen Input through the Citizens Coordinating Council to the Technical Leadership Group and the BEIPC in 2005**

#### **January**

- CCC provided comments for the BEIPC board on the allocation of remaining 2004 Clean Water Act funding.
- CCC provided comments for the BEIPC board on the process for public comments at BEIPC board meetings.
- CCC began planning the voting process for CCC chair and vice-chair positions.

#### **February**

- CCC Chair presented results of January CCC meeting to BEIPC board.
- Washington State Small Integration Group (SIG) selected a new representative.

#### **March**

- SIG for the Lower Basin and Chain Lakes, including Harrison and the Reservation, and the SIG for Benewah County/St. Joe River/St. Maries selected representatives.
- Regional SIGs nominated candidates for CCC chair and vice-chair positions.

#### **April**

- CCC reviewed, discussed, and provided the BEIPC board with comments on the 2005 workplan.
- CCC discussed and provided comments on the role and operation of the BEIPC.
- CCC members voted for CCC chair and vice-chair
- CCC members participated in interviews for a revision of the EPA community involvement plan for the Basin.

**May**

- CCC Chair presented results of April CCC meeting to BEIPC board.
- CCC invited to comment on EPA 5-year review.

**June**

- CCC provided with draft of BEIPC 5-year plan for review and comment.

**July**

- CCC reviewed and provided comments for BEIPC board on draft National Academies Report on Basin cleanup.
- CCC reviewed and discussed the process for partial deletion of Coeur d'Alene Lake.
- CCC reviewed and provided comments for BEIPC board on BEIPC 5-year plan.
- CCC Chair, TLG Chair, and BEIPC Executive Director met to discuss incorporating CCC and TLG comments into draft 5-year plan for BEIPC board.
- CCC members invited to attend public meeting on a possible repository at East Mission Flats.

**August**

- CCC Chair presented results of July CCC meeting to BEIPC board.

**September**

- CCC members provided with draft 2006 workplan for review and comment.
- CCC members invited to attend Basin Information Forum.

**October**

- CCC reviewed and provided comments to BEIPC board on 2006 workplan, particularly related to Institutional Controls Program, blood lead testing, and lake management plan development.
- CCC Chair, TLG Chair, and BEIPC Executive Director met to discuss incorporating CCC and TLG comments into draft 2006 workplan for BEIPC board.

**November**

- CCC Chair presented results of October CCC meeting to BEIPC board.

**December**

- CCC provided with information about Project Focus Team (PFT), and invited to attend PFT meetings.



**CCC Meeting**

### **Additional Outreach Activities**

In addition to the activities of the CCC, the various government entities represented by the BEIPC have supported the TLG and CCC by being involved in and supporting the activities of those groups. The government entities have been involved in outreach activities including meeting with citizen groups, giving technical presentations, assisting local teachers by providing information and science-related items for instruction, participating in Basin events, holding tours of Basin project areas, maintaining information repositories throughout the Basin, and publishing various information documents to provide updates on Basin activities and to give answers to common environmental cleanup and improvement questions.

As part of his public outreach program, the BEIPC Executive Director has made numerous presentations to local business and community groups concerning activities of the BEIPC and planned cleanup actions and activities required to protect the remedy, human health, and the environment.

## *Calendar Year 2005 Work Accomplishments*

### **Work Funded Through Federal Superfund Or Other Cleanup Funding:**

#### **Property Sampling and Remediation**

##### **2005 IDEQ Basin Property Remediation Program (OU-3)**

The IDEQ CY 2005 Basin Property Remediation Program (OU-3) resulted in the remediation of 339 properties, despite mid-season contract issues with one of the contractors. This was ten more properties than the program cleaned up in 2004. The number of properties remediated met this year's goal to complete 300-400 properties. The properties remediated equated to reclaiming approximately 44 acres. Approximately 60,285 cubic yards (cy.) of contaminated soil were removed from contact areas and disposed of at the Big Creek Repository.

Providing local employment is an important aspect of this work. The program provided an estimated 245 jobs, approximately 87% of which were filled by Silver Valley residents (for these purposes, we have defined local as residing east of the 4<sup>th</sup> of July Pass). Additionally, the program contributes millions of dollars to the local economy. The goal of the program is to provide a high quality product in an efficient and safe manner. To that end, IDEQ recently conducted a follow-up survey of 182 property owners whose properties were remediated in 2003 or 2004. The survey found that 81% of respondents rated the remediation on their property a 4 or 5 on a 1-to-5 scale (5 being best).

Properties are chosen for remediation based on criteria set by EPA. High-risk properties within the Basin, those inhabited or frequented by children age six and under, or pregnant women are emphasized. This year, there were 137 of these high-risk properties remediated in eight communities. The program also emphasized target areas in order to complete the remediations as efficiently as possible. The 2005 season's emphasis was Mullan and other Upper Basin areas.

Property remediation started in OU-1 (Box) in 1989. The total number of properties remediated in the entire Coeur d'Alene Basin Superfund Site by all of the programs to-date is approximately 3,835 properties. IDEQ is continuing to sample properties to determine how many will ultimately need to be remediated. Over 600 properties were sampled in 2005.

##### **2005 UMG "Box" Remediation Program (OU-1)**

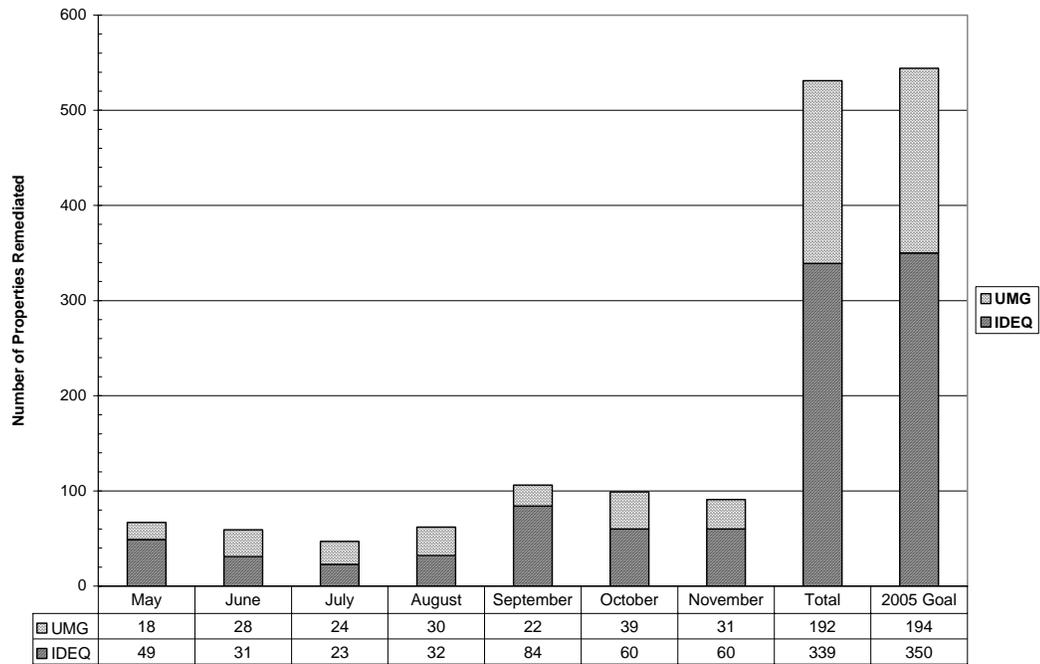
The Upstream Mining Group's (UMG) "Box" Remediation Program completed 192 properties in their quest to complete residential-area remediations. In addition to finishing large outlying property remediation, the UMG program will begin the certification process in 2006. This process is required before EPA can certify that the UMG cleanup in a community has been completed. Certification of the Box is expected to take a year and a half.

##### **Other Box Remediation Work (OU-1)**

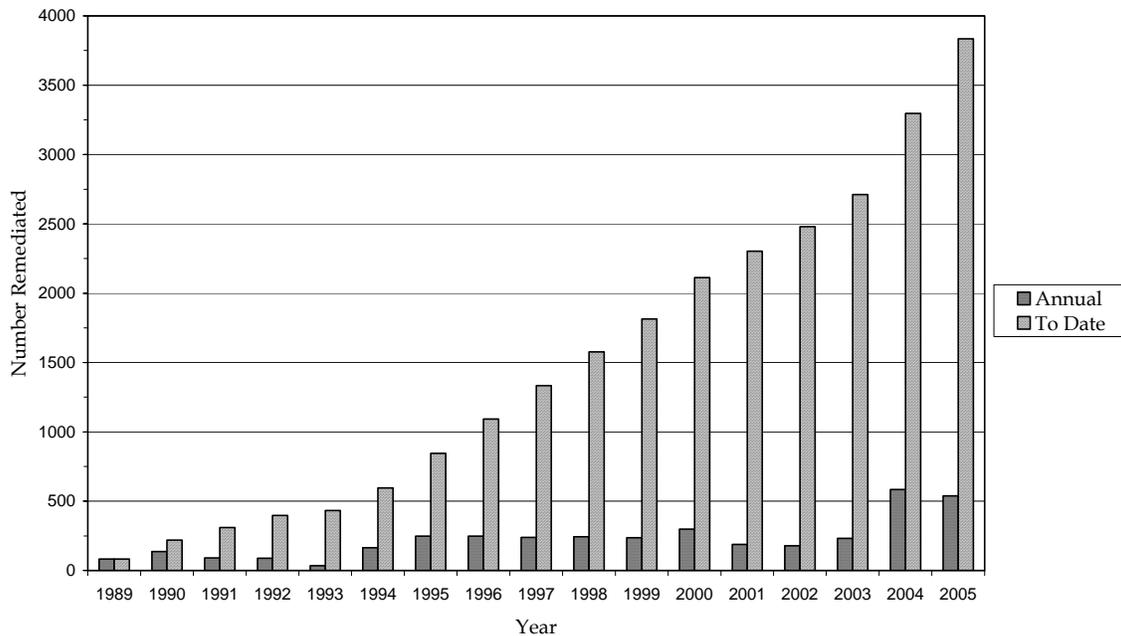
Other work completed in the Box included the Kellogg Alleys Resurfacing Project. The City of Kellogg and IDEQ partnered to remediate and resurface approximately 43,840 square feet of Kellogg alleys within the Box.

IDEQ provided \$150,000 to the City of Kellogg for the project. Project management assistance was provided by IDEQ out of their Kellogg Superfund Project Office. The City's Public Works Department administered the contract.

### 2005 Property Remediation



### Total Remediated Properties





## Property Remediation

## Water Treatment

During 2005 the Water Treatment Project Focus Team (PFT) continued to work on issues related to water treatment in the Canyon Creek drainage. To reduce zinc loads to the South Fork Coeur d'Alene River, the OU-3 ROD calls for treatment of up to 60 cubic feet per second (cfs) of Canyon Creek surface water. The ROD assumes a yearly average treatment reduction of 322 pounds per day of dissolved zinc load directly in Canyon Creek, and requires that treatment be demonstrated for water near the mouth of the creek. The current focus of the investigation and pilot studies is on achieving this goal through remediation of groundwater in Canyon Creek. It is currently unclear whether the goals of the ROD can be met through this approach.

Activities during 2005 have included the installation of two new monitoring and test wells near the toe of the Silver Valley Natural Resource Trustee (SVNRT) repository in the Canyon Creek watershed; the construction and startup of four pilot-scale treatment systems [located at the Central Treatment Plant (CTP) in Kellogg]; and the operation, maintenance and monitoring of these systems in accordance with the pilot study work plan. Additional information on well installation and pilot plant operation is provided on the next page.

## **Well Installation and Sampling**

During well installation, bedrock was encountered at 34 ft. below ground surface (bgs). The first well was completed with a screened interval from 24-34 ft. bgs, and the second well was completed with a screened interval of 16-21 ft. bgs. The dissolved zinc concentrations in the shallow and deep wells were 13.9 mg/L and 4.88 mg/L, respectively, when the wells were sampled just after installation (9/29/05). Because these concentrations were lower than anticipated, nearby wells CC1508 and CC462 were sampled on 10/7/05 for potential use in the pilot study. Based on the results of these additional samples, the decision was made to use a blend of water from the shallow new well and well CC1508 for use in the pilot study with the objective of achieving approximately 26 mg/L dissolved zinc in the pilot study feed water.

## **Pilot Plant Operation**

The pilot treatment systems were set up at the CTP to allow for continued operation into the fall/winter season. Two feed water sources are used for the pilot study: Canyon Creek groundwater and a mixture of Canyon Creek groundwater and Bunker Hill Mine Drainage (CTP influent). Water from these sources was collected two to three times per week and transported to the pilot systems using a truck-mounted tank. Four separate treatment systems were operated; two Sulfate Reducing Bacteria (SRB) systems and two High Density Sludge (HDS – lime based) systems. Each is described briefly below:

**HDS-A1:** Treated Canyon Creek groundwater; began operation October 13th.

**HDS-B:** Treated a mixture of Canyon Creek groundwater and Bunker Hill AMD (CTP influent); began operation October 13th.

**SRB-A:** Treated Canyon Creek groundwater; began incubation period on October 13th and continuous flow operation on October 20th. SRB media consists of composted manure (40%), dolomite rock (40%), straw (20%), and fresh cow manure and pond sediment for inoculum (<1% each).

**SRB-B:** Treated Canyon Creek groundwater; began incubation period on October 13th and continuous flow operation on October 20th. SRB media consists of dolomite rock (50%), coarse sand (50%), and fresh cow manure and pond sediment for inoculum (<1% each).

The pilot studies were completed in December and the results are being evaluated for presentation to the PFT in January 2006.



## Canyon Creek

### Mine and Mill Sites

The Mine and Mill Project Focus Team (PFT) focused on remediation for the following four Upper Basin mine and mill sites:

- Upper and Lower Constitution - Pine Creek
- Golconda - South Fork CDA River
- Rex - Nine Mile Creek
- Sisters Site - Canyon Creek

The OU-3 ROD identified a number of contaminated mine and mill sites with potential for human health exposures primarily from recreational use. These four sites were selected based on a number of factors including their size, complexity, and potential for human health exposures and were incorporated into the BEIPC five-year work plan. During 2005 the following activities were conducted at these sites:

**Constitution** - Work at the Constitution site is being conducted by the U.S. Army Corps of Engineers (COE) under an Interagency Agreement with EPA and BLM. The COE completed the remedial design for Upper and Lower Constitution during CY 2005. The remedy involves consolidation of mine tailings from the upper and lower mine sites into a single repository at the Upper Constitution Mine. In September 2005, the COE awarded a contract for construction of the remedy. Construction is scheduled to begin in the spring of 2006. The construction activities are focused on the mine and mill tailings areas, remediation of the waste rock areas, the mine adit, and stream and bank stabilization work.

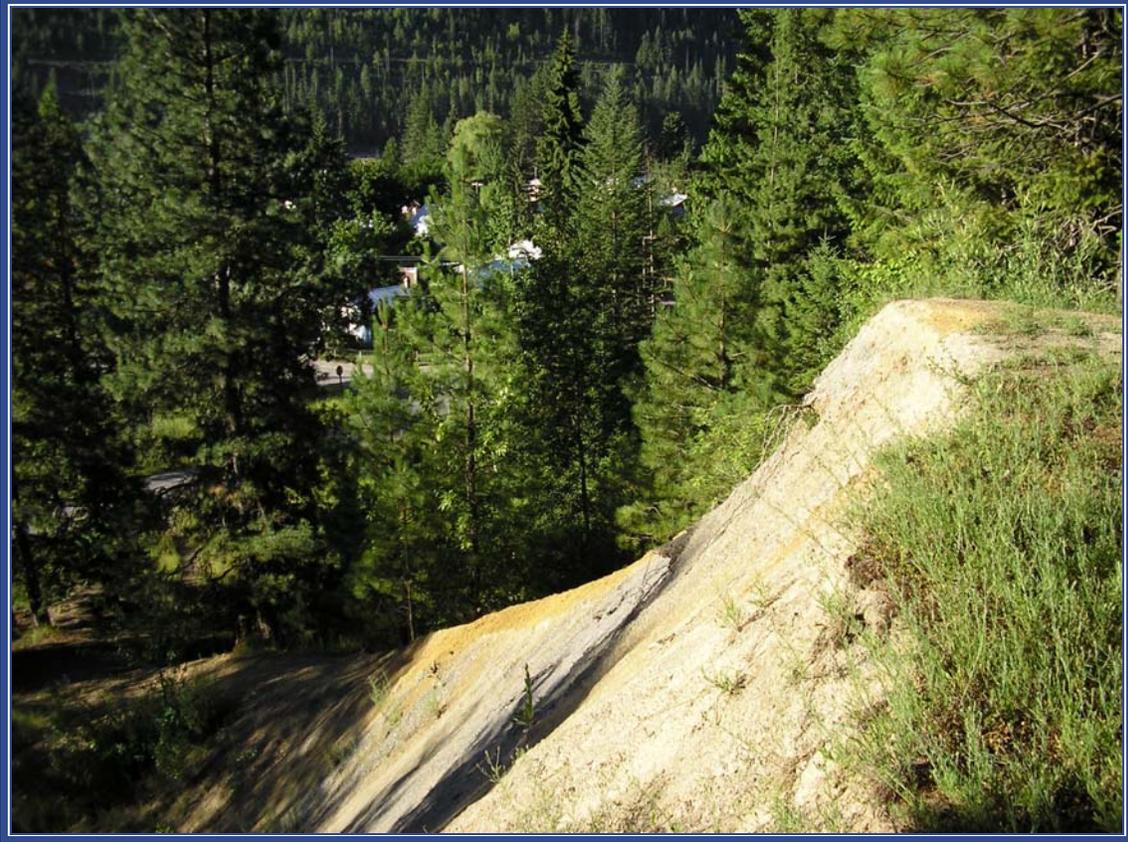
**Golconda Mine** - During 2005, EPA's contractor completed the design for an interim action at the Golconda site and continued work on the overall site design. In the fall of 2005, additional field investigations were completed at the site to fill data gaps identified during the ongoing design process. The interim action includes construction of surface water controls to help areas of the site drain prior to full scale remedy implementation. The construction of the surface water controls will be implemented by IDEQ in the spring of 2006. The overall site design will address tailings areas, adit discharges, and waste rock areas. The design will be completed by March 2006 with construction beginning in the summer 2006.

**Rex Mine** - Design work for the Rex site is ongoing and is being performed by EPA's contractor. Additional field sampling work was completed in the fall of 2005 to fill data gaps identified in the design process. The preliminary or conceptual design will be completed by December 2005 and will address surface and groundwater flows, tailings dam stability, and contaminants in the mill area. Completion of the design and start of construction is scheduled for 2006.

**Sisters Mine** – The abandoned Sisters Mine is located in Woodland Park, one mile north of Wallace and just west of Canyon Creek. The site consisted of a caved in adit at the portal and a waste rock pile. During April of 2002, five grab samples were taken from the waste rock pile by IDEQ. The samples averaged 6,108 ppm lead, 245 ppm arsenic, and 12.5 ppm cadmium. In 2005, samples taken by CDM Corp. from the small amount of water draining from the adit contained no contaminants of concern. Two monitoring wells were installed which showed the same results. The environmental concern was that the mine site is adjacent to a neighborhood. Young children were using the pile for recreation and residents were taking the waste material to use as fill elsewhere.

During 2005 EPA's contractor completed the design for the Sisters Site. Construction of the remedy was implemented by IDEQ. The construction project started July 18 and was completed October 18, 2005 at a cost of \$67,800. The following activities were conducted:

- Run-on control ditches, 3 feet wide by 1 foot deep, were excavated along the top of the pile and lined with erosion control fabric and seeded;
- The pile was graded to a 2:1 slope and six run-off control benches were cut;
- A 6-inch layer of topsoil was placed on the entire pile, seeded and then erosion control fabric was placed over that;
- Rip rap (4 to 8 inch) was placed on the run-off control benches;
- A berm composed of large rock was placed at the toe of the pile to restricted access by motorized vehicles. The logs were also strategically placed;
- The owner installed no trespassing signs; and
- The site was fertilized.



**Sisters Mine - Pre-Remediation**



**Sisters Mine Remediation**



## Sisters Mine Remediation



**Silver Dollar Growth Media Demonstration** - IDEQ initiated a study to identify alternative approaches for reclamation and revegetation of waste rock piles in the Coeur d'Alene Mining District. A series of demonstration plots was installed in October 2002 at the Silver Dollar Mine site. The plots were used to evaluate various growth media for revegetation success and soil stabilization, as well as cost-effectiveness.

The waste rock pile was re-graded to create flat area for test plots and ten plots were installed with a berm separating each plot. A sump was installed at the bottom of each plot to collect eroded material. The western-

and eastern-most plots were reserved for control and the remaining plots were assigned to differing growth media on a random basis. A brief description of each test plot is given below:

**Plot A: Control – Topsoil**

Topsoil was collected from City of Coeur d’Alene (new jail construction site). The topsoil was spread to a depth of six inches, consolidated and hydroseeded.

**Plot B: Coeur d’Alene Biosolids + Avista Wood Ash (0.75:1)**

Class B Biosolids were mixed with Avista Wood Ash at the Coeur d’Alene Wastewater Treatment Facility. A mixture of biosolids and wood ash was spread over the plot, consolidated and hydroseeded.

**Plot C: Potlatch (St. Maries) Log Yard Waste + Fertilizer**

Log yard waste was reclaimed to remove wood debris and rocks. The log yard fines were mixed with urea fertilizer and spread over the plot, consolidated and hydroseeded.

**Plot D: Kiwi Power – Quattro Environmental, Inc.**

The following components were mixed in the hydroseeder tank and the mix applied to the plot.

- Fertile Fibers Plus
- Kiwi Power
- Strong Hold + Tacker Fibers
- Atlas Soil Lock

**Plot E: Eko Compost**

Compost was spread to a depth of six inches. Seed mix was applied in dry form (whirlybird and hand thrown) and the seeded compost consolidated.

**Plot F: Glacier Gold Compost**

Compost was spread to a depth of six inches, consolidated and the plot was hydroseeded.

**Plot G: Biosol – Rocky Mountain Bio Products**

The following components were mixed in the hydroseeder tank:

- 83 lb. Biosol Mix (7-2-3)
- 5 lb. Wood Fiber Mulch

The seed mix was added and the entire mixture was applied using the hydroseeder. Five bales of wheat straw were spread over plot and 4 lb. Guardian Tackifier applied using the hydroseeder.

**Plot H: Glacier Gold Log Yard Waste**

Log yard waste was spread to a depth of six inches, consolidated and hydroseeded.

**Plot I: Coeur d’Alene Biosolids + Fly Ash (1:1)**

Class B Biosolids were mixed with Avista Wood Ash at the Coeur d’Alene Wastewater Treatment Facility. The mixture of biosolids and ash was spread, consolidated and hydroseeded.

#### Plot J: Control – Fertilizer + Berms

The plot surface was shaped to produce one to two foot berms. The following components were mixed in the hydroseeder tank and applied.

- 50 lb. of 16-16-16 fertilizer
- seed mix
- tackifier

Bluegrass straw was applied as a mulch on bottom half of plot

#### Conclusions

Each plot was evaluated for seedling emergence during the spring of 2003. Percent vegetative cover, vegetation diversity and species, and erosion loss were determined during the fall of 2003, 2004, and 2005. No two plots performed the same. A draft final report has been prepared for IDEQ and is in review.

### **Recreational Areas**

Under the ROD for OU-3, developed recreational areas such as boat ramps, picnic areas and campgrounds with surface soils containing an elevated metals concentrations (lead > 700 mg/kg and arsenic > 100 mg/kg) will be remediated. The EPA can use its CERCLA funding to remediate state, county, or local-government-owned recreational properties. However, CERCLA funding cannot be used for sites on federal land managed by the Forest Service and the BLM. As illustrated below, the biggest challenge for the Recreational Area Project Focus Team (PFT) is successful identification of properties on which EPA can conduct remedial actions.

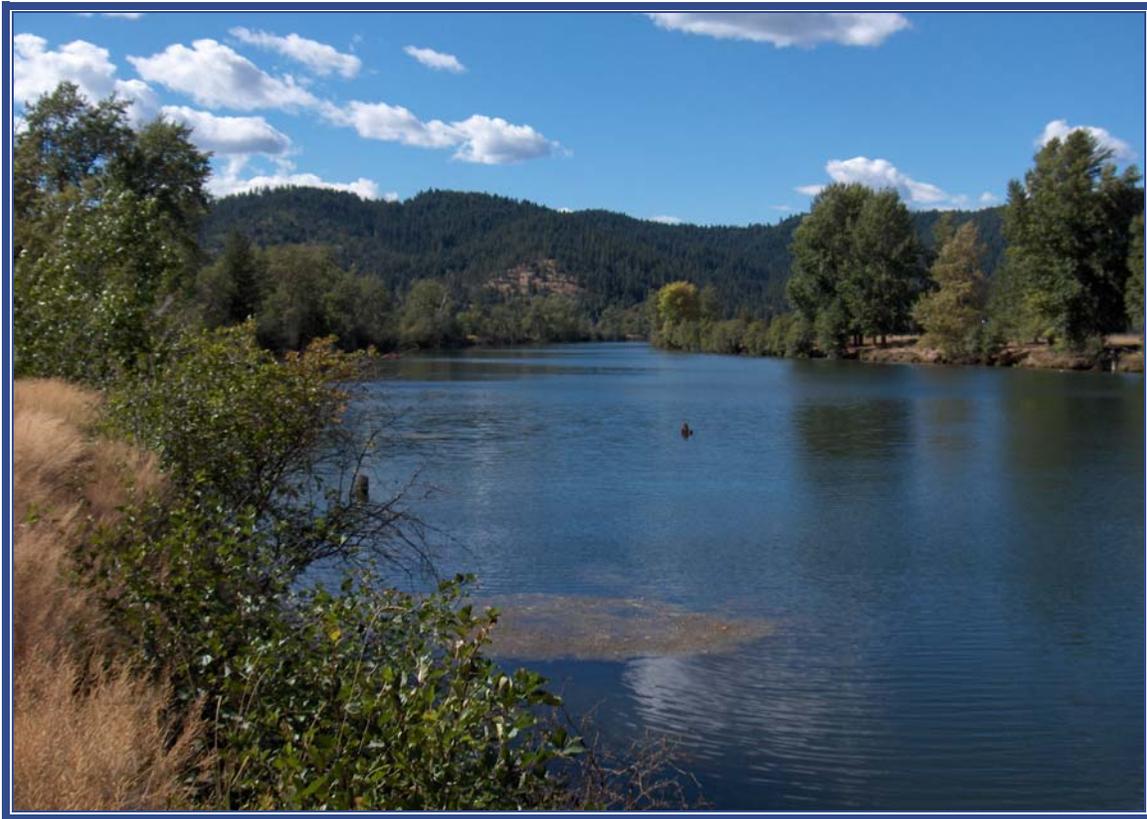
Remedial Actions at both the East of Rose Lake Boat Launch and Highway 3/Trail of the Coeur d'Alenes crossing sites were completed in 2004 and used by the public in 2005. In 2005, the Idaho Department of Fish and Game (IDFG) installed an informational kiosk and picnic tables at the Highway 3/Trail of the Coeur d'Alenes crossing site.

In an attempt to identify potential recreational remedial action projects, a PFT site visit was held on April 20<sup>th</sup>. The candidate projects were development of a campground on IDFG property at Rose Lake and enhancement of recreational facilities at Bull Run Lake. Following a PFT site visit, a community meeting was held on May 16<sup>th</sup> at the Rose Lake Community Center. Both meetings were information gathering sessions to get feedback from the PFT and community prior to initiating any design work. Following a review of the collective public input and finding minimal support for developing a campground at Rose Lake or enhancements at Bull Run Lake, neither of these actions is under consideration at this time.

The May 16th community meeting was very well attended and clearly demonstrated public interest regarding the development and operation of recreational facilities in the Lower Basin and the need to involve the public when making decisions. Development of a Lower Basin recreational management plan is contemplated in the Basin Commission 2004-2008 workplan and is included in the Basin Commission's 2005-2009 workplan.

On November 8<sup>th</sup>, a PFT meeting was held to provide current status of Lower Basin recreation area projects. Idaho Transportation Department representatives provided an update of the Highway 97 bridge replacement. The bridge is immediately downstream from IDFG's Anderson Lake Boat Launch which is a potential site for future remedial action when the bridge replacement is completed. An Avista representative provided an update on Avista's Recreational Facility Inventory and Use Survey Report. IDFG also provided an overview of the Coeur d'Alene River Wildlife Management Area Public Use Survey. There was also a discussion of using the

aforementioned recent recreational use surveys as a spring board for development of a Lower Basin Recreation Area Management Plan.



**Coeur d'Alene River**

## **Basin Environmental Monitoring**

### **Basin Environmental Monitoring Plan**

The Basin Environmental Monitoring Plan (BEMP) for OU-3 was issued in March 2004. Establishment of a BEMP is required under the OU-3 ROD. The monitoring program is critical to the successful implementation and evaluation of the Selected Remedy. EPA worked with the BEIPC's Monitoring Project Focus Team (PFT) to develop the BEMP program. The Monitoring PFT, TLG and key stakeholder agencies ultimately concurred that the BEMP is appropriate given the boundaries established by available funding. The BEMP will obtain technical data for assessment of long-term project status and trends; evaluate overall effectiveness of the Selected Remedy; and evaluate progress toward cleanup benchmarks for future Five-Year reviews. In February 2004, the BEIPC approved supporting and endorsing implementation of the BEMP.

The BEMP implements the environmental monitoring program established as part of the ecological component of the OU-3 Selected Remedy. The media of focus in the BEMP are surface water, soil/sediment, and

biological resources. The major goal of the BEMP is to monitor and evaluate the progress of the remedy in terms of improving ecosystem conditions. Consistent with that goal, the BEMP will provide data relative to the following Basin-wide monitoring objectives:

- Assess long-term status and trends of surface water, soil, sediment, and biological resource conditions in the Basin;
- Evaluate the effectiveness of the Selected Remedy;
- Evaluate progress toward cleanup benchmarks;
- Provide data for CERCLA-required five-year reviews of the progress on remedy implementation; and
- Improve understanding of Basin processes and variability to improve the effectiveness and efficiency of subsequent remedial action implementation.

BEMP monitoring activities were initiated in CY 2004 and continued in 2005. The U.S. Geological Survey and U.S. Fish and Wildlife Service are implementing the monitoring program under an Interagency Agreement with EPA. The surface water and sediment monitoring programs continued in 2005. Biological resource monitoring activities conducted during 2005 included waterfowl and songbird population surveys, aquatic invertebrate diversity/abundance at seven locations, fish /invertebrate habitat assessment, a bull trout habitat/temperature assessment and population survey.

Environmental monitoring data collected under the OU-3 BEMP (and for OU-2) are being managed in a centralized database repository established in 2004. EPA has established an instance of STORET ([www.storet.org](http://www.storet.org)) that includes historical site data and has the capacity for future data. STORET is EPA's national web-based repository for historic and future water quality, biological and physical data. The STORET data management system is used by state, tribal, EPA and other federal agencies, universities, and citizens to access the nation's environmental monitoring data. STORET was selected as the data management system for the BEMP data because it is EPA's environmental data system, non-proprietary, and a cost-effective way to manage the considerable amount of data associated with the site. Currently the results from site surface water, soil and sediment sampling are included on [www.storet.org](http://www.storet.org); while biological resource sampling results are available separately on EPA's web page.

### **Remedial Action Effectiveness Monitoring**

Remedial action effectiveness monitoring is focused on areas that have been addressed by remedial actions (e.g., tributaries, river reaches, etc.). The purpose of the effectiveness monitoring is to assess the success and effect of a given remedial action. By comparison, the BEMP will address basin-wide status and trends by monitoring at a limited number of strategic locations. Both the remedial action-effectiveness and long-term monitoring plans will be integrated by coordinating monitoring to generate comparable data (same timeframe or synoptic) and using common sampling locations where possible. Effectiveness monitoring, while not detailed in the BEMP, will incorporate similar monitoring hypotheses as those included in the BEMP. The adaptive management approach will maximize the utility of effectiveness monitoring data through comparison of results to expectations.

Remedial action effectiveness monitoring in OU-3 will be included in the designs and implementation plans for ecological-related remedial actions. Remedial action effectiveness monitoring is being implemented for the human health-related remedial actions that were recently implemented at the East of Rose Lake Boat Launch and Highway 3/Trail of the Coeur d'Alenes site.

## **Repositories**

### **Big Creek Repository**

Disposal of wastes for the Basin cleanup continued during 2005 at the Big Creek Repository (BCR). This repository is found near the confluence of Big Creek and the South Fork of the Coeur d'Alene River that is off of Interstate Highway 90 at the Big Creek Exit. The repository is developed on a reclaimed tailings pond previously owned by the Sunshine Precious Metals Company. The IDEQ took over possession of the site in 2002 and will be responsible for the site in perpetuity. While IDEQ and EPA collaboratively manage the site, IDEQ, with funds from EPA, has assumed the lead role to manage site construction and daily activities. In that capacity, IDEQ has contracted with Washington Group Incorporated (WGI) to operate and manage the site access, safety, acceptance and placement of materials; and construction of the final configuration. WGI hired local contractors to perform the construction tasks.

In 2005, approximately 60,285 cy. of contaminated soil materials were excavated as part of IDEQ'S Basin Property Remediation Program (OU-3). All of those materials were taken to the BCR from April through October, which resulted in a volume of roughly 40,000 to 50,000 cy. of compacted soils placed. The actual volumes are being verified for the final report which will be completed by March 2006.

Waste haulers to the BCR are responsible for dumping their waste in designated areas and performing the appropriate decontamination on their haul vehicles. WGI oversees these activities and was pleased to report that all of this work was completed without any lost time accidents or significant equipment damage. In 2005, IDEQ's annual water quality monitoring program found that the BCR has not impacted adjacent surface or ground waters, some of which were previously impacted by historic mine activities.

In addition to on-going operations, a new decontamination station was constructed to replace the current station in order to accommodate more trucks and improve traffic flow. In another effort to improve the efficiency of BCR, WGI has been working on a plan to modify the design of the repository. This improved plan essentially increases the total capacity of the BCR by a range of 100,000 to 175,000 cy. The difference is dependant on the feasibility of moving high-voltage transmission lines owned by Avista. The improved design figures for the final design would mean the Big Creek Repository would contain between 368,000 and 425,000 cy. when completed. The initial design for the BCR was 250,000 cy. Assuming the BCR contains about 180,000 cy. of material from the five previous seasons (2001-2005), the site is now nearly 1/2 full. The repository should last roughly another 4-5 years; assuming a fill rate of 50,000 cy./year.

### **New Repository Siting**

As summarized above and as presented to the BEIPC during the November 2005, meeting, the BCR has limited capacity requiring a new facility to be available for use within the next four years. Therefore, the task of siting a new repository location has been a priority function of IDEQ and EPA. The agencies worked collectively with the Repository Project Focus Team (PFT) to provide technical input into the evaluation of potential repository sources. IDEQ has been funded through a cooperative agreement with EPA to identify at least one additional viable repository site. Working through the PFT, several potential sites that warrant further evaluation have been identified.

The most promising site found during 2004 was the East Mission Flats Site (EMF). The EMF site is approximately 20 acres in size and preliminary design evaluations indicate that it will have a roughly 50%

larger footprint than the BCR. In addition to numerous presentations and discussions with the PFT, the IDEQ and EPA presented the EMF concept to the Kootenai County Planning representatives, the TLG, the CCC, and twice to the BEIPC. Based on input from the BEIPC, public meetings were held at the Mission State Park to present preliminary information on the siting of the proposed facility to local residents. The public provided key input to the EPA and IDEQ regarding the floodplain behavior near this site. Consequently, IDEQ and EPA worked with the U.S. Army Corps of Engineers to further analyze potential flood impacts to the proposed repository. In 2006, those impacts will be quantified and conceptual designs completed and presented to the Repository PFT and the BEIPC. It is anticipated that IDEQ will complete design on the facility within the second quarter of 2006.

Other potential sites were evaluated in 2005 using the site identification process identified in the OU-3 ROD. IDEQ and EPA are diligently moving these sites forward to assure that repositories can be found, evaluated, and constructed to meet the needs of the Basin cleanup goals. As a result of the 2005 investigations, the agencies are evaluating additional sites, primarily in the mid to lower basin. One particular site in the upper basin, that shows promise after early reviews, is located at Osburn Ponds. Preliminary evaluations are currently being conducted at this site. The PFT will be engaged on these and other sites as specific information and technical evaluation details are available.

## *Calendar Year 2005 Work Accomplishments*

### **Work Funded Through CWA Grants**

Funding from the appropriations for Federal Fiscal Years (FY) 2002, 2003, and 2004 under the Clean Water Act (CWA) Section 104(b) (3) has been made available for BEIPC project work. Under the CWA, these funds are to be used to demonstrate how *“federal, state, and local agencies can cooperatively conduct and promote the coordination and acceleration of research, investigation, experiments, training, demonstrations, surveys, and studies relating to the causes, effects, extent, prevention, reduction, and elimination of pollution.”*

Funding available for FY 2002 projects totaled \$2,000,000; FY 2003, \$1,788,300; and FY 2004, \$1,988,200. Following is a summary of work accomplished to date on these projects:

### **FY 2002 Grant Projects**

Title and Implementing Entity	Sub-Grant	Costs as of 12/31/05
Lake Monitoring Water Quality Studies USGS, CDA Tribe, USFWS	\$675,000	\$484,640.60
Streambank Stabilization IDEQ	\$445,000 \$15,540 BLM	\$461,734.55
Lake Education and Information Outreach Program CDA Tribe and KSSWCD	\$80,000	\$55,800.09
Mullan Inflow and Infiltration Assessment South Fork CDA River Sewer District	\$800,000	\$757,164.23
Grant Total	\$2,000,000	\$1,759,339.47

Note that the budget for the Streambank Stabilization project has been augmented by an additional grant in 2003.

### **Lake Monitoring Water Quality Studies**

**Sub-Grant Amount** - \$675,000 (a. \$515,000 USGS, CDA Tribe; b. \$160,000 USFWS)

**Costs as of 12/31/05** – a. \$366,746.19 & b. \$117,894.41

**Portion (a)**

**Estimated % Complete** – 65 %

**Purpose of Project** – Conduct monitoring of lake water quality to assess nutrient, sediment, and metal loading, and status of and potential trends in lake water quality; to assess improvements/impacts from upstream environmental clean-up projects; and assess impacts from further development projects along the lakeshore.

**Status of Project** – Two and one-quarter years of the three water years (2004-2006) of monitoring at the 5 open-lake sites have been completed by USGS. The two years (water years 2004-2005) of sampling 12 bays, and the one year (water year 2005) of near-shore metals sampling (funded by a supplemental 2005 CWA grant, South Lake Sampling Project B402) at 6-8 additional sites along the southeastern shore of the lake and in the vicinity of the historic railroad bridge crossing the mouth of the St. Joe River and delta have been completed by the Tribe as described in the workplan(s). Quality assurance/quality control samples have all been acceptable. Several information updates have been presented at Basin Commission meetings and the Basin Information Forum. Project CWA-1a is on track for completion in late 2006, and will provide (in a USGS report) a characterization of current water quality conditions and trends along with a comparison of the conditions found in the early 1990s studies, and a strategy for efficiently and effectively monitoring lake water status and trends over the long-term. Project B402 has been completed and the results will be incorporated into the report produced under CWA-1a.

**Conclusions** – The year-round sampling program has successfully tracked the annual cycle of lake productivity in relation to input and output of nutrients and metals.

#### **Portion (b)**

**Estimated % Complete** – 75%

**Purpose of Project** – Ecological monitoring of Coeur d'Alene Lake under this Clean Water Act grant is designed to identify baseline conditions for ecological receptors in the Lake. This information is necessary to determine present conditions and future changes in the ecological condition of the lake. These studies include: (1) an evaluation of bull trout health based on water quality parameters collected by other parties from the lake; (2) an evaluation of waterfowl health through an assessment of lead (Pb) concentrations in waterfowl blood and sediment Pb concentrations in waterfowl feeding areas; and (3) an evaluation of metal residues in whole fish as a baseline of metal bioavailability.

**Status of Project** – A final report from this sub-grant evaluating the exposure of waterfowl to Pb in the Lake (“Health of Waterfowl Utilizing Lake Coeur d’Alene, Idaho”) was publicly released and provided to the BEIPC in May 2005.

Bullheads were collected from Coeur d'Alene Lake in May 2005 as representative samples of fish receptor exposure in the lake. Whole fish were analyzed by the University of Wyoming in July 2005 for cadmium, lead and zinc. Statistical analysis of lab results and development of a report evaluating a metal bioavailability baseline for fish, health of fish receptors, and risk of exposure of piscivores to lead, cadmium and zinc are ongoing and expected to be completed in early 2006. The evaluation of bull trout health based on Coeur d'Alene Lake water quality parameters collected by other parties will be conducted in early 2006.

## **Streambank Stabilization**

**Sub-grant Amount** - \$445,000  
\$15,540 BLM Funding

**Revised Sub-grant Amount** - \$460,540 IDEQ

**Costs as of 12/31/05** - \$461,734.55; \$1,194.55 overrun funded from 2003 sub-grant.

**Estimated % Complete** – 100 %

**Purpose of Project** - Construct and monitor the effectiveness of several techniques to protect the Coeur d'Alene River banks from the erosive forces of boat wakes.

**Status of the Project** - Stabilization treatments that emphasize bioengineering approaches were installed along both banks of an 1800-foot-long river reach 1.5 miles upstream from Medimont on privately-owned and State-owned land. Access to the project site for equipment mobilization, import and export of materials, and personnel transport was by boat or barge. The treatments constitute research into controlling sediment releases into the river and Coeur d'Alene Lake while supporting wildlife goals. Factors affecting this performance include boat wake impacts; extent of revegetation; ability to adjust to changes in the river; and two flow regimes.

The riverbank treatments contain three primary components. The first component was installation of a protective treatment to control impacts of boat wakes on upper riverbanks during summer river levels. These treatments were either rock toe protection or wooden structures for wave attenuation (wake breaks). The second was implementation of a revegetation program above and within the protective treatment to enhance stabilization, improve aesthetics, and enhance terrestrial and aquatic habitat. The third was installation of riparian plantings along the top of bank that enhanced wildlife habitat and help transition from bank treatments to floodplain. Five treatments were utilized to address boat wakes, stabilize banks, and recover vegetative growth along the river. Two treatments included wake breaks (plank and brush) – structures to attenuate the energy of boat wake waves before they reach the riverbank. Three other treatments used rock armoring to protect the bank from erosion due to wave action. A protective layer of rock at the bank level where waves first impact will allow the establishment of woody vegetation with roots below the summer water level in a strip behind the rock. Therefore, clean fill was imported for placement in crucial planting areas. Rock blankets extend into the river until the top of the treatment is six inches below the surface of the average summer pool elevation. The blanket also extends up onto the bank to the upper bank toe and a minimum of 18-inches above the average summer pool elevation.

Earthwork was conducted during the period when the level of Coeur d'Alene Lake, and thus the lower Coeur d'Alene River, was lowered so as to avoid working under water. Grading to achieve gentler slopes was done only where woody vegetation was generally absent. Vegetation was planted in the spring and was irrigated during the summer as warranted. The site was surveyed prior to construction, monitored in 2005, and will be monitored in 2006 and 2007 to document changes. Monitoring activities will include measuring cross-sections, bathymetry, fish surveys and erosion pins and photo documentation.

**Conclusions** - All treatments are performing well; however, they have only been in place for a short time period. Once the monitoring phase is complete, more definitive conclusions are likely.

### **Lake Education and Outreach Program**

**Sub-grant Amount** - \$80,000 (\$50,000 to the Coeur d'Alene Tribe, \$30,000 to the Kootenai/Shoshone Soil and Water Conservation District (KSSWCD))

**Costs as of 12/31/05** – \$49,632.91 CDA Tribe, \$6167.18 KSSWCD

**Estimated % Completed** – 90%

**Purpose of Project-** This project seeks to improve water quality in Coeur d'Alene Lake by developing an information and education program that will educate the public on ways to reduce the amount of nutrients entering the Lake and its' tributaries. The following methods are used to reach out to the community in a coordinated effort between the KSSWCD and Coeur d'Alene Tribe, 1) Develop an educational PowerPoint that contains historical and current information on how communities established and flourished within the basin as well as provide ways to ensure the water quality of the Lake, 2) Present the PowerPoint entitled: "Our Gem" to a variety of community groups, area schools, homeowner associations, and other interested parties within Benewah, Kootenai, and Shoshone Counties, 3) Provide pre and post questionnaires to audiences in order to assess the effectiveness of the presentation, and 4) Produce an educational lake map utilizing the assistance from partnering agencies and citizens within the community.

**Status of Project** - All items listed above have been completed except for the compilation of questionnaires to assess effectiveness of "Our Gem" and the final production and distribution of the map. It is the intent of the Tribe and KSSWCD to print 500 copies of the map and distribute them to local vendors and other public venues. Once we receive feedback on the factual content of the map we will determine if any revisions need to be made. Once we assess the comments and made appropriate revisions we will publish the remaining copies and distribute them.

**Conclusions** - The Coeur d'Alene Tribe and KSSWCD will write a brief summary of their perception of the effectiveness of this public education outreach and if directed by the Coeur d'Alene Basin Environmental Project Commission, assist in the development of a funding proposal for further lake education public outreach.

### **Mullan Inflow and Infiltration Assessment**

**Sub-grant Amount** - \$800,000 SFSD

**Costs as of 12/31/05** - \$757,164.23

**Estimated % Complete** – 98 %

**Purpose of Project** - This project evaluated sources of metals loadings to treatment facilities, investigated the potential reduction of metals loadings to the South Fork Coeur d'Alene River, determined the efficacy of infiltration and inflow (I/I) removal projects to reduce peak plant flows, and advanced the current state of

knowledge with regard to the cause and effect of such efforts to reduce pollution, transaction costs, and community coordination.

**Status of Project** – Major construction was completed in October 2004. A draft report of the project's findings was issued November 2004 and will be finalized in January 2006.

**Conclusions** - The construction methods employed were found to be equally effective at removing I/I from the system, provided the approach was followed through fully. Results to date show a flow reduction of 43% to 78%, with an average reduction of 64% for the months of January through September. The actual reduction is difficult to ascertain because of climatological fluctuations. Stream flows are similar to average for 2004, and groundwater levels are at/or above the pipe invert; therefore, the results appear significant.

The reduction in flows has made an impact on metals concentrations and loads in terms of averages and scatter. However, the statistical significance is inconsistent. At one standard deviation (84% confidence interval), cadmium and zinc show a significant change between pre-and post-construction conditions; however, lead does not. It may be possible that the remaining metals loads are due to human input and the drinking water, but without a more detailed mass balance it is difficult to be certain how much they may contribute.

Although conclusive results may not be possible for all the metals, the reduction in flows results in a net positive effect for the WWTF. Because the flows are lower and exhibit less scatter, metals loading on average appears lower and less variable. If a metals removal process is required, the smaller peak flows will result in smaller basins, related equipment, and chemical usage, resulting in a lower capital and O&M investment for the District. Consequently, this project has been successful for the Mullan WWTF with regards to reducing its overall treatment requirements for metals.

## FY 2003 Grant Projects

Title and Implementing Entity	Sub-Grant	Costs as of 12/31/05
Woodland Park Groundwater Quality Monitoring, IDEQ	\$35,948	\$34,229.59
Meyer Creek Flood Control, IDEQ	\$31,521	\$24,344.39
Upper East Fork Ninemile Water Quality Evaluation, INL	\$193,652	\$193,802.75
Metal & Nutrient Removal Pilot Page WWTP, South Fork River Sewer District	\$179,763	\$178,018.02
East Fork. Pine Creek Revegetation, BLM	\$61,624	\$61,284.47
Inventory and Evaluation of Private Lands for Restoration of Wetland Habitats USFWS, IF&G, Ducks Unlimited	\$152,406	\$12,106.24
Fish response to Bank Stabilization IF&G, USFWS, U of I	\$107,550	\$46,940.43
Sediment Transport & Bed Evolution Phase 1, USGS	\$193,706	\$193,329.57
CDA Lake Response to Watershed Remediation Phase 1, USGS	\$190,406	\$190,000.00
North Fork CDA River Hydrologic & Sediment Study, IDEQ	\$165,810	\$21,262.77
Mica Bay Nutrient Reduction Phase 1, IDEQ	\$20,000	\$17,636.40
Lower Lakes Aquatic Veg. Survey, CDA Tribe	\$143,275	\$85,610.00
Canyon Creek Groundwater Metal Source Characterization, INL	\$190,253	\$180,101.72
Stream Bank Stabilization Addition, IDEQ	\$122,386	\$26,926.07
Grant Total	\$1,788,300	\$1,265,592.42

### Woodland Park Groundwater Quality Evaluation

**Sub-grant Amount** - \$35,948; \$33,921 IDEQ, \$2,027 BEIPC

**Costs as of 12/31/05** - \$34,229.59

**Estimated % Complete** – 100 %

**Purpose of Project** – Canyon Creek is a tributary to the South Fork Coeur d’Alene River. Based on probabilistic modeling, it is estimated that the Canyon Creek drainage contributes approximately 456 pounds per day of dissolved zinc to the South Fork Coeur d’Alene River. The ROD for OU3 calls for treatment of up to 60 cubic feet per second of Canyon Creek water. In an effort to develop the most effective alternative for the Canyon Creek drainage, it is necessary to look at ground water and surface water contributions. The Water Treatment Project Focus Team (PFT) requested that additional sampling be conducted to add groundwater data

to the database in order to help facilitate treatment option decisions in the future. To address this, a quarterly monitoring program was implemented at selected ground water sites in the Woodland Park area of the Canyon Creek Drainage.

**Status of Project** – Project Complete

**Conclusions** – The project successfully sampled groundwater. The data will provide valuable information needed to make responsible treatment option decisions.

### **Meyer Creek Flood Control**

**Sub-grant Amount** - \$31,521; \$30,000 IDEQ, \$1,521 BEIPC

**Costs as of 12/31/05** -\$24,344.39

**Estimated % Complete** –100 %

**Purpose of Project** – To assess the condition of the Meyer Creek diversion system and propose possible alternative remedial recommendations and order of magnitude cost estimates to prevent recontamination of the Superfund remedy in the City of Osburn during a flood event.

**Status of Project** – The City of Osburn was constructed largely on mine waste materials, so heavy metal contamination is common in soils. As part of the Coeur d’Alene Basin Superfund project, the EPA and the State of Idaho are conducting a commercial and residential property remediation consisting of replacement of the upper layer of contaminated soil with clean soil.

The upper Meyer Creek channel contains two short culverts that are sized to handle a 75-100 year flood flow. However, the lower channel contains an 1800-foot-long pipe which inspection shows is leaking. The pipe has both 18-inch and 36-inch diameter sections, and has a major reduction in slope along its lower portion. The maximum capacity of the pipe is a 10-year flood event. Also, the long, old, undersized pipe with a dramatic slope break has a high risk of plugging by sediment load. In the event of a failure, part of the City would flood, the human health remedy being put in place would be compromised. This may result in contaminated material being distributed in portions of the City.

**Conclusions** - The results of this study show that that the risk of failure of the Meyer Creek pipe is moderate. Four possible solutions were evaluated. The preferred alternative consists of constructing a combination pipeline and open channel system, partly in the current alignment and partly in a new one. The open channel portions have the added benefit of creating opportunities for linear parks. Much of the field investigation has been accomplished. The elevation survey is complete and some flood maps have been produced. A hydrologic assessment of Meyer Creek has been completed and historical conditions researched.

### **Upper East Fork Nine Mile Creek Water Quality Evaluation**

**Sub-grant Amount** - \$193,652; \$193,029 INL, \$623 BEIPC

**Costs as of 12/31/05** - \$193,802.75

**Estimated % Complete** – 90 %

**Purpose of Project** – Success Mine Passive Water Treatment – 1) Reduce plugging in the Success Mine Apatite Barrier by making design modifications to the sediment chamber and injecting air into the Apatite to break up clogging in the media; 2) Perform a tracer study to determine hydraulic flow paths and residence times; 3) Analyze Apatite to determine forms of metals precipitates and where the reactions occur; and 4) Modify the East Reactor and add new media to the barrier

East Fork Ninemile Creek Monitoring – Conduct monitoring of the East Fork of Ninemile Creek to assess where metal loadings occur; how seasonal flows affect metal loadings; evaluate overall water chemistry; and determine forms of metal precipitates.

**Status of Project** – Success Mine Passive Water Treatment – 1) During the fall of 2004, the modifications to the sediment chamber of the Success Mine Apatite Barrier were completed. The modifications made it easier to determine if plugging was occurring in the sediment chamber and made it easier to remove accumulated sediments. During the spring of 2005, air was injected into the media to fluff up the media and break up any preferential flow paths that had developed. 2) The tracer study was completed during the fall of 2004. 3) Apatite samples were collected during the summer of 2005. The samples have been analyzed using Powder X-ray Diffraction. 4) In November 2005 modifications were made to the east side of the Apatite Barrier and new media was added. The modifications were successful and the new Apatite was mixed with plastic packing rings to lower the risk of plugging and lengthen the time that the media will be functional.

East Fork Ninemile Creek Monitoring – The sample collection along the East Fork of Ninemile Creek was completed this year and the data will be evaluated to determine trends and relationships among the data.

**Conclusions** – Success Mine Passive Water Treatment – 1) Modifications to the sediment chamber made it easier to visually determine when the chamber is plugging. It is also easier to remove sediment from the chamber when it does build up. Air sparging does provide at least a temporary remedy when the reactive barrier plugs, but it is only a temporary fix. 2) The tracer study showed that the flow through the area is too rapid for injection of carbon into the groundwater to be effective prior to entering the Apatite Barrier. It also showed that there is a strong likelihood that there is a significant amount of groundwater that bypasses the Apatite Barrier, although the exact locations were not determined. 3) The results of the Apatite analysis so far show that based on the forms of Zn and Pb precipitates formed that the process of removal is a result of both chemical and biological processes. 4) The addition of the new apatite and packing rings was completed and initial results appear to be positive. Samples are being collected quarterly for the next year to see how long the benefits of the new media will last.

East Fork Ninemile Creek Monitoring – The data from the East Fork Monitoring project is currently being evaluated and conclusions will be available in 2006. There are three quarters of sampling events to collect from the discharge of the reactive barrier with evaluation of the data collected, and the preparation of the final report remaining to be completed.

## **Metal & Nutrient Removal Pilot Page WWTP**

**Sub-grant Amount** - \$179,763 Page WWTP

**Costs as of 12/31/05** - \$178,018.02

**Estimated % Complete** – 98 %

**Purpose of Project** - Evaluate two emerging technologies for precipitation and/or adsorption for removal of heavy metals (lead, cadmium, zinc, and copper) and phosphorus from point source discharges in the Silver Valley, especially the Page Wastewater Treatment Plant (WWTP).

**Status of Project** - The operating phase of the pilot study is complete and a draft report was submitted for review. A final report is expected to be released in January 2006.

**Conclusions** – Removal of heavy metals is attainable to Site Specific Criteria as defined in the Page WWTP NPDES permit. Removal to Gold Book Criteria was not consistently possible. Phosphorus removal to levels on the order of 0.050 mg/L may be possible with the technologies; however, consistent results were not obtained. Concurrent removal was not observed to the established criteria during the pilot testing.

## **East Fork Pine Creek Revegetation Pilot Project**

**Sub-grant amount** - \$61,624; \$61,218 BLM, \$406 BEIPC

**Costs as of 12/31/05** - \$61,284.47

**Estimated % complete** – 30 %

**Purpose of project** – The project will help identify practical and cost-effective methods to accelerate natural revegetation processes. Vegetation is needed to ultimately stabilize many stream reaches within the Coeur d’Alene Basin. The project is intended to help identify and contrast the relative “bang for the buck” of several locally applicable revegetation methods.

**Status of project** – Metals analysis for planting site soils was dropped from the original project based on a determination that metals were not a major limiting factor within the project reach and the money would be better spent on materials.

Planting sites in Pine Creek have been selected and evaluated by BLM. Additional field measurements for site characterization include: channel cross-sections; pebble counts (i.e., floodplain surface roughness); and depth to water and flow measurements that will be collected throughout the field season. Several sites were trenched and planted in the summer of 2004 (under separate BLM funding). Results of this planting, and subsequent monitoring, will be incorporated into this project.

Two test sites were planted with a shipment of approximately 2000 containerized plants and 50 bare-root cottonwoods in May and June 2005. Despite drought conditions throughout most of the summer, end-of-season monitoring suggests first year survival rate will be good.

Additional plantings within the project area will follow in the spring and fall of 2006. Afterwards, a completion report will be prepared.

Monitoring will continue through 2008.

### **Inventory & Evaluation of Private Lands for Potential Restoration of Wetland Habitats**

**Sub-grant Amount** – \$152,406; \$152,000 USFWS, \$406 BEIPC

**Costs as of 12/31/05** – \$12,106.24

**Estimated % complete:** 25 %

**Purpose of Project** - The USEPA OU-3 ROD for the lower Coeur d'Alene Basin specified cleanup actions within the Basin that would provide 4,500 acres of safe waterfowl feeding areas, including remediation and conversion of 1,500 acres of agricultural lands to wetlands, leading to safe, functioning wetlands for use by Tundra Swans. The proposed survey will inventory private wetlands and associated agricultural lands to determine: (1) their value as wetland habitat; (2) what modifications maybe necessary to restore to optimal habitat; (3) landowner acceptance of wetland restoration on the property; and (4) the level of lead contamination on the property. The completed project will provide a comprehensive inventory that identifies private land that may be suitable for the wetland remediation and restoration project goals outlined in the ROD.

**Status of Project** – Ducks Unlimited biologists began inventorying privately owned agricultural and wetland areas in the Coeur d'Alene Basin identified as having potential for creation or enhancement of wetland habitat in early 2005. Ducks Unlimited and USFWS developed a landowner map of target areas identified as high priority for wetland remediation/restoration. Owners of target areas have been solicited for interest in the program through personal letters mailed to their residences. Landownership, potential project location and soil metals contamination surveys will continue through 2009 based on need and project status.

### **Monitoring Fish Responses to Bank Stabilization in the Coeur d'Alene River**

**Sub-grant Amount** – \$107,550; \$41,739 USFWS, \$60,000 U of I, \$5911 Id. Fish & Game & BEIPC

**Costs as of 12/31/05** – \$46,940.43

**Estimated % Complete** – 45%

**Purpose of Project** – Bank stabilization efforts will likely be proposed to treat more than 20 miles of the CDA River banks in coming years. Resource management agencies are being asked to evaluate the impact of a rapidly increasing number of bank stabilization project proposals for the CDA River. This monitoring effort will (1) establish baseline fish community structures; (2) evaluate variability in fish community structures over time; (3) evaluate the effect of existing bank stabilization projects on fish communities; (4) determine appropriate monitoring strategies for future bank stabilization projects; and (5) recommend bank stabilization techniques that have positive effects or minimal adverse effects on fish communities.

Results of this monitoring effort will provide information which will reduce agency concerns and requirements when considering approval of required permits. Additionally, results will likely reduce individual bank stabilization project costs and permitting requirements by providing much of the initial baseline information, by defining appropriate monitoring techniques, and by identifying inter-species interaction dynamics associated with natural and artificial habitat structures within the CDA River system.

**Status of Project** - Members of USFWS and the University of Idaho conducted fish community field surveys in August 2005. A total of 24 sites and 3 boat ramps were sampled in this first of three sampling events. The spring sampling is scheduled to occur between March and May 2006, and the summer sampling is scheduled to occur in July or August 2006. Results will be included in a final report evaluating fish species, age structure, and relative abundance within study areas expected early 2007.

### **Computer Models to Assess Sediment Transport & Bed Evolution in the Lower Coeur d'Alene River – Phase 1**

**Sub-grant Amount** - \$193,706; \$193,300 USGS, \$406 BEIPC

**Costs as of 12/31/05** - \$193,329.57

**Estimated % Complete** – 100 % Phase 1

**Purpose of Project** – Develop a set of tools that can be used by resource managers for evaluating proposed projects designed to minimize the transport of metal contaminated sediments in the Lower CDA River. Objectives include the utilization of existing data and collection of additional data to develop and calibrate computer models of the river between Cataldo and CDA Lake. These models would be capable of simulating the hydraulic and sediment transport characteristics of the River over a wide range of stream flow and lake elevation conditions. The models would be used to test proposed projects prior to implementation with the goal of improving their design and avoiding unanticipated and costly mistakes.

A 1-dimensional (1-D) sediment transport model will be constructed to simulate sediment transport and bed evolution in the main River channel reach between Enaville (North Fork) and Pinehurst (South Fork) and the inlet to CDA Lake (Harrison). This model simulates the transport of sediments including sand, gravel, and cobble and quantifies average erosion and deposition rates in the bed throughout the reach. A 2-dimensional (2-D) hydraulic and bed shear stress model will be constructed and calibrated to a short reach in and around the Dudley area (river mile [RM] 156.2). The 2-D model will be nested within the 1-D model thus providing a useful exchange of information between the two models.

**Status of Project** - Calibration and development of a 1-D sediment transport model is about completed. The modeled reach extends approximately 35-miles from the Enaville gaging station on the North Fork and Pinehurst gaging station on the South Fork to the Harrison gaging station near CDA Lake on the main stem. More than 200 cross sections were used in the 1-D model. Cross sections downstream of the Cataldo Mission were mainly developed by combining bathymetry data from Avista Corporation and USGS LIDAR data taken in August 2004. These cross sections were approximately space ¼-mile. However, in the Dudley area, cross-section spacing was decreased to about 350 ft to provide a greater amount of information in a reach of concern. Upstream of the Cataldo Mission, cross sections were mainly taken from field surveys in 2004 for this study. Cross sections also from the Mike11 model (Borden, Goodwin, Mink, and Liou, 2004), and from the FourPt

model (Woods and Beckwith, 1996) were used in this study. Cross-section spacing in this reach ranged from ¼-mile to ½-mile.

The model also required roughness coefficients (Manning's  $n$ ) at every point in the cross section. Roughness coefficients established from the previous 1-D models of the river were used as the starting values for this study. Only values for the channel portion were later adjusted during "model calibration".

Suspended and total sediment load curves of Clark and Woods (2001) at the Enaville, Pinehurst, Cataldo, and Harrison gaging stations were updated with the latest collected suspended sediment samples. However, bedload curves were not updated because no bedload data were collected since the Woods and Clark (2001) study. Then total sediment load, which is needed by the 1-D model, was calculated by adding the suspended and bedload curves.

The 1-D model will be calibrated using measured water-surface elevations and bedload and suspended-sediment transport. Then the model will be used to simulate management alternatives to assess erosion and deposition under varying hydraulic conditions especially in the Dudley area.

The development and calibration of a 2-D hydraulic and bed shear-stress model was completed. The 2-D model extends from RM 154 to RM 159, a 5-mile reach in and around the Dudley area. The model grid is curvilinear and follows the river. Grids in the center of the river are approximately 2.5 meters (8.2 ft). The width of the grid was extended to more than 300 ft beyond the river so that large discharges can be simulated in the model. Bathymetry and LIDAR data were combined and mapped to the coordinates of the grid through a "nearest-neighbor" approach to determine the topography for each model node (grid corners).

The model was calibrated to water-surface elevations at five specific discharges based on two gaging stations. Elevation at the downstream boundary was based on water-surface elevation data from the Rose Lake gaging station (12413810), and discharge at the upstream boundary (RM 159) was based on discharge data from the Cataldo gaging station (12413500). Water-surface elevations throughout the 2-D model were calibrated against results from the 1-D model. Calibrated discharges ranged from 10,500 ft<sup>3</sup>/s to 28,900 ft<sup>3</sup>/s, and water-surface elevations at the downstream boundary (near Rose Lake) ranged from about 2130.0 ft to about 2139.5 ft.

In these simulations, the highest flow velocities were usually centered in the river. Velocities greater than 6.5 ft/s were found with a river discharge of 28,900 ft<sup>3</sup>/s. These simulations showed that as discharge increased, average velocity increased. The 2-D model also showed recirculation currents especially at the larger bends. These and other model results will be presented in a report.

The hydraulic and sediment characteristics of the river and results from the 1-D and 2-D models will be presented in a report that will be published in 2006. A draft of this report has been started.



**Coeur d'Alene River**

## **Simulation Model to Evaluate Coeur d'Alene Lake's Response to Watershed Remediation – Phase 1**

**Sub-grant Amount** - \$190,406, \$190,000 USGS, \$406 BEIPC

**Costs as of 12/31/05** – \$190,000

**Estimated % Complete** – 100 % Phase 1

**Purpose of Project** – Provide the entities responsible for management of Coeur d'Alene Lake with a sophisticated computer modeling system with which to simulate the lake's long-term responses to a wide range of remediation strategies to be implemented under the ROD and the Lake Management Plan.

**Status of Project** – The phytoplankton bioassays to assess zinc toxicity in the lake are about 75% complete. Development of modeling algorithms for enhanced simulation of benthic-flux geochemical processes is about 80% complete. The May-June 2005 field experiment was successfully completed by the University of Western Australia modeling team. The modeling team has incorporated information from the extensive historic data bases and the data gathered during the field experiment and has used ELCOM to simulate hydrodynamic processes in the lake. The geochemical code used in CAEDYM has been extensively upgraded by the modeling team in order to better simulate benthic and water-column processes.

**Conclusions** – Phase 1 was designed to deliver to the modeling team the data bases and field experiment data needed to assemble a preliminary version of the lake model. Phase 1 has been successfully completed and is being used to complete the development of a 3-dimensional water-quality model.

### **North Fork Coeur d’Alene River Hydrologic & Sediment Study**

**Sub-grant Amount** - \$165,810; \$165,000 IDEQ, \$810 BEIPC

**Expenditures as of 12/31/05** - \$21,262.77

**Estimated Percent Complete** – 10%

**Purpose of Project** - Provide a watershed assessment in document form that will effectively aid and support the future development of a Sediment TMDL Implementation Plan for the North Fork Coeur d’Alene River sub-basin (a plan that will be developed by a Watershed Advisory Group).

#### **Work performed in calendar year 2005**

1. In consultation with an established North Fork Technical Advisory Team (TAT), the environmental firm Watershed Professionals Network, LLC (WPN) was selected and contracted to perform the North Fork CDA River Watershed Assessment.
2. On September 13, 2005, WPN had its initial meeting with the North Fork TAT to establish agreements, time schedules, and strategies to accomplish Phase 1 of the project: a data mining effort to collect existing, known information and data about the North Fork sub-basin from agencies such as USDA Forest Service (FS), Idaho Fish & Game, University of Idaho, and IDEQ. WPN staff was given a reconnaissance field trip by the FS.
3. From September through early December, WPN has conducted its data mining effort. The FS is under contract for \$10,000 for its significant part in collecting and preparing material for WPN. The data mining effort is scheduled for completion by mid-December.
4. By the end of December, WPN is scheduled to complete a draft document, *Summary of Existing Knowledge and Completed Improvement Projects within the North Fork Coeur d’Alene River Sub-basin*. This draft report will be reviewed by the North Fork TAT, and will be used to establish the parameters for Phase 2 of the watershed assessment conducted in 2006.

### **Mica Bay Nutrient Reduction Project – Phase 1**

**Sub-grant Amount** - \$20,000; \$19,000 IDEQ, \$1000 BEIPC

**Costs as of 12/31/05** – \$17,636.45

**Estimated % Complete** – 100 %

**Purpose of Project** – Demonstration and training project for wetland landowners to restore out-of-bank flows in tributary streams as they enter Coeur d'Alene Lake. Restoration of delta wetland functions will reduce nutrient loading to the lake and encourage ground water recharge. Nutrient loading to Coeur d'Alene Lake must be minimized to insure that metals remain bound to sediment particles rather than dissolving in the water column. A unique combination of conditions exists at the project site that, if overcome, will translate to success at most other sites around the lake.

**Status of Project** - It was decided to conduct a feasibility study to answer some basic questions about the hydrology of the area, design alternatives and the expected benefits of the project. This study titled, “Mica Bay Design Alternatives” was submitted to IDEQ on October 5, 2005. This study will have to be reviewed by the TLG and BEIPC before proceeding further with the project funded in Phase 2.

### **Lower Lakes Aquatic Vegetation Survey Project**

**Sub-grant Amount** - \$143,275 CDA Tribe

**Costs as of 12/31/05** - \$85,610

**Estimated % Complete** – 70 %

**Purpose of Project** - The primary purpose of this study is to develop baseline data on submersed aquatic plant species distribution and biomass in Benewah, Chatcolet and Round Lakes. The secondary purpose is to estimate nutrient (primarily phosphorus) release from the existing plant beds into the water column of these lakes and subsequently into Coeur d'Alene Lake. The tertiary purpose is to inspect these lakes for the presence of invasive, noxious aquatic species.

**Status of Project** - The planned two years of field sample collection has been completed for both the transects and grid points. Laboratory analyses of samples collected during year one has been completed. Samples collected during year two are at the lab and analyses are nearing completion. The survey for noxious aquatic plants was completed.

**Conclusions** - Submersed aquatic vegetation was found between the two-foot and fourteen-foot depths throughout the study area. Generally, plant growth was found to be dense with different species occupying most depths from the bottom to near surface. A total of 12 different species or genus groups were seen during this survey work with seven of these being found in a large number of samples. The pondweeds (*Potamogeton* species) were visually dominant, as was common waterweed (*Elodea* species). Identifiable Pondweeds included Richardson's (*P. richardsonii*), Fern-leaf (*P. robinsii*) and Big Leaf (*P. amplifolius*). The thin-leaved pondweed species (which were grouped together because of the difficulty of separating these similar appearing and often intermixed species) were the most prevalent of the pondweeds. Other species found frequently were Coontail (*Ceratophyllum demersum*) and Nyad (*Najas* sp.). An important finding of this work was of the presence, and wide distribution, of the noxious aquatic weed, Eurasian watermilfoil (*Myriophyllum spicatum*). This plant was not only widely distributed, but was strongly dominant in certain areas which were estimated to total approximately 200 acres.

## **Canyon Creek Groundwater Metal Source Characterization**

**Sub-grant Amount** - \$190,253; \$189,847 INL, \$406 BEIPC

**Costs as of 12/31/05** - \$180,101.72

**Estimated % Complete** – 30 %

**Purpose of Project** – This project is designed to determine how, in practical terms, zinc and other metals are distributed between different physical and chemical states in the Canyon Creek alluvium. This information will be used to help understand how natural processes can affect the movement of contaminant metals through Canyon Creek and how engineered processes can impact contaminant metal mobility or sequestration.

**Status of Project** – Cores were collected in early November 2004. Samples at four intervals from each core (approximately from the surface to 15 feet in depth) were immediately stored in liquid nitrogen at the field site and are now stored at –80°C at the INL laboratory. The sequential extraction methods are now being reviewed and planned. Sequential extractions will be tested first on samples collected between the primary samples. Water chemistry properties from Canyon Creek are being summarized and will be used in the interpretation of metal speciation data. Sequential extractions and leachability tests were performed in 2005.

**Conclusions** – There are no analytical conclusions at this time.

## **Streambank Stabilization Addition**

**Sub-grant Amount** - \$122,386 IDEQ

**Costs as of 12/31/05** - \$26,926.07, plus \$1194.55 overrun from previous year.

**Estimated % Complete** – 20%

(See narrative under FY 2002 grant listing)

## FY 2004 Grant Projects

Title and Implementing Entity	Sub-Grant	Costs as of 12/31/05
Mica Bay Nutrient Reduction , IDEQ	\$121,000	\$120.04
Additional Water Quality Sampling in Selected Nearshore Areas Southern CDA Lake, CDA Tribe	\$13,000	\$12,934.74
Plummer Wastewater Treatment Plant, City of Plummer	\$129,900	\$81,040.71
Plummer Creek Watershed Nutrient Load Assessment and Management Plan Development, CDA Tribe	\$165,700	\$277.16
Pinehurst Flood Impact Study, IDEQ	\$330,000	\$1,950.67
Silver Crescent Complex Habitat Restoration, USDA Forest Service	\$318,000	\$245.35
Canyon Creek Treatability Study, IDEQ	\$100,000	\$0
South Fork Sewer District Toxicity Reduction Study, SFSWD	\$115,900	\$6600.04
Simulation Model to Evaluate CDA Lake Response to Watershed Remediation, USGS	\$210,000 \$11,800 Peer Review	\$26,835.46
Lower river Sediment Transport Model and Bed Evolution Phase 2, USGS	\$128,000	\$54,704.35
Assessment of the Economics and Effectiveness of Alluvium Sorting, IDEQ	\$207,000	\$196,064.02
CDA Lake Management Plan Implementation, CDA Tribe and IDEQ	\$137,200	\$120.04
Grant Total	\$1,988,200	\$380,892.58

### Mica Bay Nutrient Reduction Project - Phase 2

**Sub-grant Amount** - \$121,000; \$119,020 IDEQ, \$1,980 BEIPC

**Costs as of 12/31/05** - \$120.04

**Estimated % Complete** – 0 %

(See narrative under FY 2003 grant listing)

## **Additional Water Quality Sampling in Selected Nearshore Areas of Southern CDA Lake**

**Sub-grant Amount** - \$13,000; \$12,752 CDA Tribe, \$248 BEIPC

**Costs as of 12/31/05** - \$12,934.74

**Estimated % Complete** – 100 %

**Purpose of Project** – See narrative for Lake Monitoring Water Quality Studies funded in 2002

**Status of Project** – Work Complete, report to be incorporated into report for Lake Monitoring Water Quality Studies.

## **Plummer Wastewater Treatment Pilot**

**Sub-grant Amount** - \$129,000; \$127,918 Plummer City, \$1,982 BEIPC

**Costs as of 12/31/05** - \$81,040.71

**Estimated % Complete** – 60 %

**Purpose of Project** – The objective of this project is to show the viability of a wastewater infiltration treatment wetland in Plummer, Idaho. A successful wetland would benefit water quality in Chatcolet Lake and Coeur d'Alene Lake by reducing nutrients that now flow into Plummer Creek from the Plummer Wastewater Treatment Facility. Nutrients, particularly phosphorus, contribute to the eutrophication of Chatcolet by promoting algal growth, which in turn reduces the available oxygen in the water column. Low dissolved oxygen promotes the chemical reduction of metals in the sediment, thus releasing those metals into the water column. Microorganism growth due to high nutrients also directly liberates iron and other active metals into the water as metal reducing bacteria populations increase when nutrients are at relatively high concentrations. This is supported by strong positive correlations between iron and TP concentrations during the summer in shallow, eutrophic lakes.

**Status of Project** - Design of the pilot wetland facilities was completed by August 6, 2005 and submitted to the IDEQ for review and approval for construction. That approval was received September 26, 2005 and construction began immediately. The pilot wetland facilities construction was then completed and has been operating since the end of October 2005. The flow rate has been set at 1,000 gallons per day based on the geotechnical study assessment of the infiltration rate of the native soils. Two sampling rounds have been completed by the City of Plummer. The City's Consultant, USKH, will prepare the first quarterly report in January 2006 after the analytical results of the December 2005 samples are available.

## **Plummer Creek Watershed Nutrient Load Assessment, Modeling and Management Plan Development**

**Sub-grant Amount** - \$165,700; \$162,730 CDA Tribe, \$2,970 BEIPC

**Costs as of 12/31/05** - \$277.16

**Estimated % Complete** – 1 %

**Purpose of Project** – Characterize nutrient concentrations and transport through the Plummer Creek watershed and into Chatcolet Lake. Develop a Watershed Nutrient Management Plan which will include appropriate and specific point nutrient source control efforts for the Plummer Creek watershed.

**Status of Project** - Final planning for the field work was conducted by the Project Leads and a Quality assurance Project Plan was prepared (covering field data collection, laboratory analyses and modeling) and submitted to IDEQ and EPA for review. The planned two years of field sample collection has been initiated (the first two sample collection trips occurred October 26–27 and November 21-22, 2005).

## **Pinehurst Flood Impact Study**

**Sub-grant Amount** - \$330,000; \$327,030 IDEQ, \$2,970 BEIPC

**Costs as of 12/31/05** - \$1,950.67

**Estimated % Complete** – 1 %

**Purpose of Project** – Develop stream channel and drainage infrastructure techniques to control and mitigate water pollution and protect property from recontamination and flood impacts.

**Status of Project** – Began public involvement process in 2005

## **Silver Crescent Complex Habitat Restoration**

**Sub-grant Amount** - \$318,700; \$315,730 FS, \$2,970 BEIPC

**Costs as of 12/31/05** - \$245.32

**Estimated % Complete** – 0 %

**Purpose of Project** - This project is a demonstration project to study the feasibility and economics of watershed restoration in areas where the original stream type has been severely altered by mining and environmental cleanup activities. Innovative high gradient stream restoration techniques will be further adapted for the unique circumstances in the East Fork of Moon Creek. Work to be implemented and studied includes actions converting stream types from unstable to more stable types while accounting for site features such as a large repository located in floodplain. Various revegetation approaches on and adjacent to waste repositories, as well

as the re-establishment of wildlife and fish habitat through the use of constructed or installed structures will also be applied.

**Status of Project** – Currently, contract preparation work for the Silver Crescent is being completed. Construction contract award and implementation is planned for 2006. Stream channel construction with the installation of wildlife and fish habitat structures will encompass the bulk of the construction phase at the site. Comprehensive native vegetative restoration at the site including treatment for noxious weeds will follow, possibly utilizing a second contract in 2007. A post construction report will outline the entire project and any changes that were made. This report will include an evaluation of successes and a section dedicated to “lessons learned”. Site maintenance and a 5-year monitoring effort will begin at the close of the construction phase.

### **Canyon Creek Treatability Study**

**Sub-grant Amount** - \$100,000; \$99,010 IDEQ, \$990 BEIPC

**Costs as of 12/31/05** - \$0

**Estimated % Complete** – 2 %

**Purpose of Project** – Develop an alkaline precipitation design as a low cost method of achieving a substantial improvement toward ROD goals, and determine if the proposed water treatment technology is implementable in the South Fork CDA River.

**Status of Project** – A contract has been awarded to provide technical oversight for the project. A Request for Proposals for the design work has been issued by IDEQ. Bids are due January 4, 2006; it is anticipated a contract will be awarded by the end of the month.

### **South Fork Sewer District Toxicity Reduction**

**Sub-grant Amount** - \$115,900; \$114,415 SFSD, \$1,485 BEIPC

**Costs as of 12/31/05** - \$6,600.04

**Estimated % Complete** – 5 %

**Purpose of Project** - A Toxicity Reduction Evaluation (TRE) is a stepwise process or plan by which a wastewater treatment plant (WWTP) investigates and identifies agents of toxicity in its effluent, and evaluates the effectiveness of toxicity control options. The South Fork of the Coeur d’Alene River Sewer District’s Page wastewater facility has failed previous Whole Effluent Toxicity (WET) testing. The effluent characteristics of the Page WWTP are similar to effluents from other treatment plants with the exception of the high metals concentrations. As a result, it is believed that the metals in the influent stream are directly responsible for the effluent toxicity which impairs receiving water quality. As an example, *daphnia magna sp.* exhibits chronic effects from 0.15 µg/l of cadmium based on data from EPA’s Quality Criteria for Water 1986 (EPA 440/5-86-001), while the Page WWTP has historically discharged 2.6 µg/l. Currently, limited data exist presenting the concentrations of metals, especially in combination, that are likely to cause chronic effects in *ceriodaphnia*

*dubia sp.* This problem also impacts other discharges in the basin including the active mining companies and inactive mining claims that will also have difficulty meeting the new limits. Understanding the impact of metals on chronic toxicity is of keen interest to all of the dischargers in the Silver Valley.

**Status of Project** – Page WWTP performance and typical effluent characteristics are being compared against typical potential toxicant levels. The Quality Assurance Project Plan (QAPP) is in draft form and under review. Pending approval, sampling and analytical work will begin in January 2006.

### **Simulation Model to Evaluate CDA Lake Response to Watershed Remediation - Phase 2**

**Sub-grant Amount** - \$221,800; \$11,800 Peer Review, \$1,980 BEIPC, \$208,020 USGS

**Costs as of 12/31/05** - \$26,835.46

**Estimated % Complete** – 12 % Phase 2

**Purpose of Project** – See narrative for Phase 1 funded in 2003

### **Lower River Sediment Transport Model and Bed Evolution – Phase 2**

**Sub-grant Amount** - \$128,000; \$127,010 USGS, \$990 BEIPC

**Costs as of 12/31/05** - \$54,704.35

**Estimated % Complete** – 43 % Phase 2

**Purpose of Project** – See narrative for Phase 1 funded in 2003

### **Assessment of Economics and Effectiveness of Alluvium Sorting as a Mine Waste Removal Strategy**

**Sub-grant Amount** - \$207,000; \$205,019 IDEQ, \$1,981 BEIPC

**Costs as of 12/31/05** - \$196,064.02

**Estimated % Completion:** 80 %

**Purpose of Project:** The pilot work is implemented to answer a number of questions concerning the alluvium sorting approach to mine waste removal and disposal from watersheds in the Basin: is the additional cost of sorting stream bed materials contaminated with mine wastes balanced by savings in transportation and repository volume costs; and is there an added benefit because sorting results in a more homogeneous waste material that reacts to compaction better and ultimately results in lower permeability of compacted waste in the repository? The project also includes a monitoring component. Using a gravel quality monitoring approach, the amount of mine waste contamination will be assessed in the gravels of Prichard Creek at the removal sites pre- and post-project implementation.

**Status of the Project:** Mill wastes were removed at the Monarch Site during the 2005 construction season. The wastes were placed in a second cell constructed at the Prichard Creek Waste Repository, which was closed in early October. The escalation of petroleum costs made waste removal at the Bear Top Mill Site originally anticipated not feasible. As part of the Monarch Site treatment, the alluvium-mine tailings mix was removed and sorted from 3.2 acres of floodplain. Exhaustive records of material excavated, sorted and hauled were kept. Costs were carefully recorded. Nuclear densitometry and other soils laboratory analyses were completed on samples of bulk (unsorted) and sorted material compacted in the repository prior to its closure. Pre-project assessment was completed on the level of metals contamination in the sediments of Prichard Creek through the project area.

**Preliminary Conclusions:** An interim report on the economic and physical (density/permeability) consequences of sorting alluvium is currently under development by IDEQ. Preliminary calculations indicate a sorting strategy for alluvium-tailings material resulted in a small savings in transportation costs and a large savings in repository construction costs. These savings far offset the added expense of sorting. Large cost savings were obtained despite some inefficiency in the project that could be rectified in subsequent projects. Having a commercial outlet for the sort oversize material would save additional funds, even if the material was donated. Disposal in the aggregate production market will also remove material from the floodplain that, if not handled properly, will negatively affect re-vegetation. Sorted material compacted in the repository achieved significantly lower permeability (20 times) than the bulk material with equal compaction treatment. The result was a waste deposit less prone to groundwater percolation independent of the capping system employed.



Alluvium Sorting

## **CDA Lake Management Plan Implementation**

**Sub-Grant amount** – \$137,200; IDEQ - \$36,711, CDA Tribe - \$99,500, BEIPC - \$989

**Costs as of 12/31/05** - \$120.04

**Estimated % Complete** – 5 %

**Purpose of Work** – As a joint project between the IDEQ and the Coeur d’Alene Tribe, a survey audit of measures taken by various agencies, organizations, and industries to fulfill the management actions recommended and specified in the 1996 Coeur d’Alene Lake Management Plan (LMP) will be conducted. IDEQ will also use this opportunity to identify implementation actions taken within watersheds of the CDA Basin which have EPA approved sediment Total Maximum Daily Loads (TMDLs). The results of this survey of accomplishments will be viewed as directly tied to current efforts by IDEQ and the Tribe to develop a joint update document to the 1996 LMP. Then with community input, IDEQ and the Tribe will implement a revised LMP for Coeur d’Alene Lake.

### **Work performed in calendar year 2005**

1. On September 1, 2005, the initial planning meeting for this project was held, with IDEQ staff and Tribal staff. An agreement was made to develop a Workplan as a project guidance document.
2. A draft Workplan was completed by IDEQ in mid-September and forwarded to the Tribe for review and comment. Unfortunately, the tribal representative had to leave his position with the Tribe. Another tribal representative to conduct this project with IDEQ has not yet been assigned.
3. During October – December, IDEQ has examined each recommended management action in the 1996 LMP, and has prepared customized questionnaires for each lead group (agencies, organizations, and industries) identified in the LMP management action tables. These questionnaires will form the basis of initial meetings with lead agencies and the survey of accomplishments. The questionnaires are also designed to determine reasons why management actions were not completed or initiated, and to seek input on the level of appropriateness, practicability, and economic reality of action items that we find have not been initiated. Scheduling of meetings with lead groups will begin in January 2006.

## *Challenges Ahead*

The BEIPC is a novel approach to guiding environmental cleanup and restoration of a complex Superfund effort. This organizational process merged many differing perspectives and jurisdictions with the mandate of advancing environmental cleanup and restoration while valuing local citizen input and recommendations to agency and BEIPC actions. Every layer of the organization faces the challenges of implementing a program through balance and cooperation to insure progress.

The process has created a high degree of interaction and has resulted in a dynamic interplay among government entities, citizens, and special interests having a broad knowledge and experience base. This level of participation does not come without cost. BEIPC groups, committees, and teams demand a considerable

commitment of human resources and many hours of volunteer time for some members of the TLG and CCC. Volunteer members of the TLG need some type of financial assistance to cover their expenses, and the organizations they represent need to commit adequate resources to sustain and improve effectiveness of the TLG.

Fundamental to the success of the BEIPC process as well as the environmental remediation and restoration efforts is a commitment for long-term federal CERCLA and state funding. Secure funding sources are necessary to insure implementation of the ROD human health and ecological objectives for OU-2 Phase 2 and OU-3, and to support Coeur d'Alene Lake management and protection actions. The EPA funding stream for human health related remedies has been steady but there is a need to convince EPA Headquarters and Congress that funding streams for ecological cleanup and remedies need to be supported. The State of Idaho Legislature has appropriated funding for both human health and ecological needs. Assuring sustainable funding intended to advance cleanup and restoration actions as planned in the RODs represents a significant challenge and the BEIPC has developed a Funding Project Focus Team in an attempt to address some funding issues.

Other major challenges include developing and implementing an Institutional Controls Program (ICP) for affected areas in OU-3; locating and developing waste repositories for disposal of remedial action and ICP wastes; developing and implementing methods to deal with contaminated ground water including EPA and the State of Idaho agreeing to a State Superfund Contract amendment for the implementation of the OU-2 ROD amendment; developing an infrastructure upgrade program in the Box (OU-1&2) and Basin (OU-3) to insure protection of the remedy; and coordinating BEIPC Lake related projects with that of the Tribe and State's efforts to finalize and implement the updated Lake Management Plan.



OU-2

## Appendix A: 2005 Work Plan

**Table 1 Summary of Activities for 2005 Work Funded with Superfund or Other Cleanup Monies**

<b>Proposed Activity</b>	<b>Scope</b>	<b>Objective</b>	<b>Lead Agency</b>
Big Creek Repository Management	Operate the Big Creek Repository.	Provide repository capacity for all cleanup activities that are to be conducted in 2005.	IDEQ/EPA
Development of additional Repositories	Siting and design of additional repositories. This includes public involvement and information dissemination. Currently the E. Mission Flats has been identified as a potential site that warrants further investigations.	Provide additional repository by 2006.	IDEQ
Basin Institutional Controls Program (ICP)	Develop a program to manage activities to protect remediated areas from recontamination and to protect human health and the environment in areas designated for cleanup actions where no remedy is yet in place.	By December 2006, establish an ICP in OU3.	IDEQ
Residential and Community Areas Sampling and Remediation	Conduct soil sampling and remediate contaminated properties in affected communities.	Remediate 300 to 400 properties, and perform sampling to support additional remediations in subsequent years.	IDEQ
Drinking Water Upgrades	Provide alternate water supplies for homes on private wells where drinking water is contaminated by heavy metals.	Provide drinking water connections or point-of-use treatment to affected properties.	IDEQ
Recreational Area Remediation	Continue to identify and implement recreational area remedial actions.	Provide additional safe recreation areas.	EPA/IDEQ

<b>Proposed Activity</b>	<b>Scope</b>	<b>Objective</b>	<b>Lead Agency</b>
Mine and Mill Sites Design and Remediation	Prepare design and construction documents for priority mine and mill sites that address human health exposures from recreational use.	Complete design and begin construction at Constitution and Sisters sites in 2005. Identify interim actions at Golconda and Rex and implement these actions in 2005.	EPA/IDEQ
Canyon Creek Technology Evaluation	Complete Phase I Treatability Study and begin Phase II pilot studies of active and passive technologies. Implement MSE work plan for evaluation of passive treatment media in Canyon Creek	Evaluate technologies that will achieve the goals of the ROD and provide the most efficient and cost effective approach.	EPA/IDEQ
Development of Clean-Up Standard for Riparian Soils	Continue development of ecological lead cleanup goals for soil.	Determine cleanup goals for future actions in the upper and lower basin.	USFWS
Basin Environmental Monitoring	Continue implement the Basin-wide Environmental Monitoring Plan (BEMP).  Implement remedial action effectiveness monitoring as appropriate	Conduct environmental monitoring to assess long-term status and trends to measure the effectiveness of remedial activities.	EPA with USGS, USFWS, IDEQ
Lower Basin Forum	Assist the TLG in reaching a common understanding of which issues are important in the lower basin, and in how these issues are related.	Await several other studies to be completed prior to providing the basis for the sequencing remedial action work in the lower basin.	CDA Tribe

**Table 2 Summary of Activities for 2005 Work Funded with CWA**

<b>Code</b>	<b>Sub-grant title</b>	<b>Sub-grantee</b>	<b>Objective</b>	<b>Calendar Year 2005 Work</b>
CWA1	Three-Year Lake Study	CDA Tribe/USGS/USFWS	Monitoring nutrients, metals, biological conditions in CDA Lake.	Continue data gathering. Continue data compilation and evaluation.
CWA2	Bank Stabilization	IDEQ	Evaluate bank stabilization methods.	Complete revegetation. Report on evaluation.
CWA3	Lake Education Program	CDA Tribe & KSSWCD	Educate users on lake stewardship and water quality concerns.	Continue to present "Our Gem". Finalize Lake Outreach Map. Summarize perceptions of effectiveness. Develop funding proposal for continued outreach.
CWA4	Mullan Inflow/Infiltration	South Fork. Sewer District	Metal and nutrient reduction. Infrastructure improvement.	Remove monitoring wells. Continue sampling and analysis of wastewater treatment plant effluent. Submit report.
CW01	Woodland Park Groundwater Quality Monitoring	IDEQ	Monitor groundwater quality and potential metal loading from contaminated groundwater reaching surface water in Canyon Creek	Continue data collection. Compile data.
CW02	Meyer Creek Flood Assessment	IDEQ	Conduct a flooding/recontamination assessment for the buried surface water diversion for Meyer Creek	Continue to collect technical and design parameters. Prepare preliminary assessment

<b>Code</b>	<b>Sub-grant title</b>	<b>Sub-grantee</b>	<b>Objective</b>	<b>Calendar Year 2005 Work</b>
				document for Basin Commission and City of Osburn.
CW03	Upper East Fk. Ninemile Water Quality Evaluation	INL	Monitoring surface and groundwater quality in Ninemile Creek and further evaluation and testing of water treatment pilot project at the success Mine	Inject air into apatite at Success, and evaluate effectiveness in breaking up clogged media. Analyze apatite at Success to define chemistry and microbiology. Perform quarterly water sampling in EFNMC for physical, chemical, and biological characteristics to determine seasonal variations. Write final report.
CW04	Metal & Nutrient Removal Pilot 2 Page WWTP	South Fork Sewer District	Evaluate 2 emerging water treatment technologies to remove metals and nutrients	Issue draft report, revise draft, and issue final report.
CW05	East Fork Pine Creek Revegetation Pilot	BLM	Evaluate revegetation methods	Plant vegetation in the spring, and characterize sites for fall planting.

<b>Code</b>	<b>Sub-grant title</b>	<b>Sub-grantee</b>	<b>Objective</b>	<b>Calendar Year 2005 Work</b>
CW06	Inventory and Evaluation of Private Lands for Potential Restoration of Wetland Habitats	USFWS	Inventory and evaluation of private lands for potential restoration of wetland habitats	Continue inventory, survey landowner interest in participation, analyze samples, and prepare preliminary designs.
CW07	Monitoring Fish Responses to Bank Stabilization in the Coeur d'Alene River	USFWS	Monitoring fish response to bank stabilization projects on the CDA River	Select study design and begin monitoring.
CW08	Computer models to assess sediment transport and bed evolution in the Lower Coeur d'Alene River – Phase 1	USGS	The goal of this project is to develop a set of tools that can be use by resource managers for evaluating proposed projects designed to minimize the transport of metal contaminated sediments in the Lower Coeur d'Alene River. Objectives include the utilization of existing data and collection of additional data to develop and calibrate computer models of the river between Cataldo and Coeur d'Alene Lake. These models would be capable of simulating the hydraulic and sediment transport characteristics of the river over a wide range of streamflow and lake elevation conditions. The models would be used to test proposed projects prior to implementation with the goal of improving their design and avoiding unanticipated and costly mistakes. Phase 1 is the 1-dimensional model.	Calibrate 1-dimensional model. Select flow and transport scenarios, and run them for final report.

<b>Code</b>	<b>Sub-grant title</b>	<b>Sub-grantee</b>	<b>Objective</b>	<b>Calendar Year 2005 Work</b>
CW09	Simulation Model to Evaluate Coeur d'Alene Lake's Response to Watershed Remediation Phase 1	USGS	The goal of this project is to provide the entities responsible for management of Coeur d'Alene Lake with a sophisticated computer modeling system with which to simulate the lake's responses to a wide range of remediation strategies to be implemented under the Record of Decision and the Lake Management Plan. The project objective is to utilize existing, or to develop as needed, physical, chemical, and biological data in an existing suite of well-proven one, two, and three-dimensional lake models capable of simulating the limnological complexity of Coeur d'Alene Lake.	Complete and test 1-dimensional model.
CW10	North Fork Coeur d'Alene River - Hydrologic and Sediment Study	IDEQ	Hydrologic and sediment yield study to support project effectiveness of sediment TMDL implementation plan	Summarize existing physical and biological knowledge. Begin preliminary watershed assessment.
CW11	Mica Bay Nutrient Reduction Project Phase 1	IDEQ	Reduce sediment and nutrient loading in Mica Bay and Coeur d'Alene Lake by constructing wetlands.	Review case studies, survey cross-sections and topography, develop and assess alternatives, and report findings to the BEIPC

<b>Code</b>	<b>Sub-grant title</b>	<b>Sub-grantee</b>	<b>Objective</b>	<b>Calendar Year 2005 Work</b>
CW12	Lower Lakes Aquatic Vegetation Survey	CDA Tribe	Determine aquatic vegetation biomass and nutrient content to estimate potential nutrient release to lakes and develop harvest plan.	Repeat grid sampling, collect available information on nutrient release research, and prepare completion report.
CW13	Canyon Creek Groundwater Metal Source Characterization	INL	Provide key information about the mechanisms and rates of depletion of the metals in the two major source materials, reworked tailings and alluvium, as groundwater withdrawn and treated.	Complete data compilation, finalize and test sequential extraction method complete sequential extractions, conduct leachability and mobility tests, and prepare report.
CW14	Bank Stabilization Project Monitoring Pilot Study	IDEQ	Continue monitoring and performance evaluation of three Lower Coeur d'Alene River bank stabilization project for 2005 – 2007.	Monitor effectiveness of implemented treatments.
B4-1	Mica Bay Nutrient Reduction Project Phase 2	IDEQ	Reduce sediment and nutrient loading in Mica Bay and Coeur d'Alene Lake by constructing wetlands.	Prepare design based on feasibility study. If time permits, begin construction.
B4-2	Additional Water-Quality Sampling in Selected Nearshore Areas of Southern Coeur d'Alene Lake	CDA Tribe	Sample additional near-shore sites in the Lake's southern portion better define the extent and possible source of elevated cadmium, lead, and zinc concentrations in nearshore and pelagic locations south of Harrison and north of Chatcolet Lake.	Collect samples, continue compilation and evaluation of data, and begin preparation or report sections.

<b>Code</b>	<b>Sub-grant title</b>	<b>Sub-grantee</b>	<b>Objective</b>	<b>Calendar Year 2005 Work</b>
B4-3	Plummer Wastewater Treatment Pilot	City of Plummer	Construct and study the effectiveness of a pilot cascading overland flow wetland to determine if future construction of a wastewater treatment facility discharging to a wetland is feasible in the CDA Basin	Award construction contract, complete construction, and begin monitoring and testing.
B4-4	Plummer Creek Watershed Nutrient Load Assessment, Modeling and Management Plan Development	CDA Tribe	Develop a Watershed Nutrient Management Plan which will include appropriate and specific point nutrient source control efforts for the Plummer Creek watershed.	Identify specific monitoring sites, prepare Quality Assurance Project Plan, and collect field data.
B4-5	Pinehurst Flood Impact Study	IDEQ	Develop stream channel and drainage infrastructure techniques to control and mitigate water pollution and protect property from recontamination and flood impacts	Conduct assessment of sediments for heavy metals, prepare design report.
B4-6	Silver Crescent Mine and Mill Complex Habitat Restoration	USFS	Construct a demonstration project to re-establish a fully functional resident fishery and improvement of habitat to enable successful migration at a completed mine and mill site cleanup and restoration	Complete design and contract for construction.
B4-7	Canyon Creek Treatability Study	IDEQ	Develop an alkaline precipitation design to treat water that has a minimum possible capital and operating costs although it may not completely satisfy the goals of the ROD	Begin design work for completion of design in 2006.

<b>Code</b>	<b>Sub-grant title</b>	<b>Sub-grantee</b>	<b>Objective</b>	<b>Calendar Year 2005 Work</b>
B4-8	South Fork Sewer District Toxicity Reduction	South Fork Sewer District	Identify sources of toxicity in Basin community wastewater treatment plant effluent to develop options for removal of toxicants; perform bench testing to verify removals; and develop capital and O&M cost projections	Perform baseline toxicity testing, and review potential sources of toxicity.
B4-9	Simulation Model to Evaluate Coeur d'Alene Lake's Response to Watershed Remediation—Phase 2	USGS	Provide a sophisticated computer modeling system with which to simulate the Lake's response to a wide range of remediation strategies to be implemented under the ROD and the LMP.	Coordinate with University of Western Australia researchers, and provide them with bathymetry, hydrology, loading, meteorological, and limnological data. Continue bioassay work. Perform calibration experiment
B4-10	Computer Models to Assess Sediment Transport and Bed Evolution in the Lower Coeur d'Alene River - Phase 2	USGS	Continue and complete the development of modeling tools for use in evaluating future proposed projects designed to minimize the transport of metal contaminated sediments in the Lower Coeur d'Alene River.	Develop 3-dimensional model for 1500 meter reach near Dudley or Rose Lake.
B4-11	Assessment of the Economics and Effectiveness of Alluvium Sorting as a Mine Waste Removal Strategy at the Project Implementation Level	IDEQ	Establish, at a removal project level, the costs of a simple screening of removed contaminated alluvium, and assess the beneficial value of the removal strategy by assessing the change the metals content of the three-quarter inch minus fraction of the bed load sediment downstream.	Implement sorting, evaluate costs, effects on volumes needing disposal, and savings in repository costs. Monitor gravels pre- and post-construction.

<b>Code</b>	<b>Sub-grant title</b>	<b>Sub-grantee</b>	<b>Objective</b>	<b>Calendar Year 2005 Work</b>
B4-12	Coeur d'Alene Lake Management Plan Implementation	IDEQ/CDA Tribe	Conduct an extensive evaluation of all activities within one mile of the shore to evaluate what BMPs are in place, how effective they are, what BMPs are required but not in place, and to establish specific BMP audit procedures.	Meet with entities that manage or regulate land use, discuss accomplishments, and determine what activities are planned.