

# 2017 ANNUAL REPORT



*Basin Environmental Improvement  
Project Commission*

February 2018

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Cover Photo, Lower CDA Basin at Black Lake

## *Executive Summary*

The Basin Environmental Improvement Project Commission (BEIPC) is responsible for coordinating 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 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 (CDA River), Coeur d'Alene Lake and the Spokane River within the Idaho Counties of Shoshone, Kootenai, and Benewah, as well as the Coeur d'Alene Tribal Reservation within Idaho.

During Calendar Year 2017, the BEIPC coordinated and monitored accomplishments by various implementing entities for environmental cleanup and natural resource restoration work included in the BEIPC 2017 Annual Work Plan and the five-year operating plan. It also developed a 2018 Annual Work Plan and an updated five-year plan. The environmental cleanup work was performed through the federal Comprehensive, Environmental Response, Compensation and Liability Act (CERCLA/Superfund) Program and the State of Idaho environmental cleanup programs, and actions under the direction of the Environmental Protection Agency (EPA) by the Coeur d'Alene Work Trust (Trust) formed under the ASARCO Bankruptcy settlement. Natural resource damage restoration work was performed by the Coeur d'Alene Basin Natural Resource Trustees (Restoration Partnership) including the Coeur d'Alene Tribe (CDA Tribe), State of Idaho Department of Environmental Quality (IDEQ) and Idaho Department of Fish and Game (IDFG), U.S. Department of Interior through the U.S. Fish and Wildlife Service (USFWS) and Bureau of Land Management (BLM) and U.S. Department of Agriculture through the U.S. Forest Service (USFS). The Panhandle Health District (PHD) continued to manage the Institutional Controls Program (ICP) to control the release and migration of contamination remaining in place after remediation.

## *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 CERCLA National Priorities List in 1983. Operable Units 1 and 2 (OU-1&2) are the populated, industrial, and undeveloped areas in a 21 square mile area encompassing the communities of Pinehurst, Smelterville, Wardner, and Kellogg and outlying Shoshone County lands known as the "Bunker Hill Box" located within the Basin.

The BEIPC's primary purpose is to work with the EPA and IDEQ to implement the Record of Decision (ROD) for OU-3 throughout the Basin and implement the Upper Basin ROD Amendment (RODA) for portions of OU-3 and work in OU-2 included in the Amendment designed to advance the cleanup of heavy metals contamination in the Upper Basin (confluence of the North and South Forks of the CDA River and the head waters of the South Fork above Mullan).

In addition, the BEIPC is involved in:

- Assisting the EPA in developing and managing the Superfund Cleanup Implementation Plan (SCIP), a comprehensive cleanup plan for the Upper and Lower Basins based on remedies selected in the OU-3 ROD and Upper Basin RODA;
- Coeur d'Alene Lake management planning and implementation;
- Heavy metal contamination cleanup efforts at mining sites in the North Fork of the CDA River (NFCDR);
- Assisting the Resource Partnership in the implementation of their natural resource restoration program as provided for in the CDA Basin Restoration Plan; and
- Leading multi-agency coordination in addressing potential flooding in the South Fork CDA River (SFCDR) and Pine Creek drainages.

Legislation and the MOA 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 representative appointed by the council of the Coeur d'Alene Tribe; and
- One federal representative of the United States appointed by the President.

The Executive Director of the Basin Commission is Terry Harwood.

**BEIPC Membership as of December 2017:**

Name	Title	Representing
Jack Buell, Chair	Benewah County Commissioner	Benewah County
Marc Eberlein	Kootenai County Commissioner	Kootenai County
Leslee Stanley	Shoshone County Representative	Shoshone County
Phillip Cernera	Lake Management Director	Coeur d'Alene Tribe
Grant Pfeifer	Regional Director, Washington Dept. of Ecology	State of Washington
John Tippets	Director, Idaho Department of Environmental Quality	State of Idaho
Michelle Pirzadeh	Acting Regional Administrator, EPA, Region 10	Federal Government



## *Program Management*

The BEIPC operates in accordance with the Idaho statute and the MOA among the governing entities. It is responsible for coordinating the activities of federal, tribal, state, and local government agencies implementing the ROD for OU-3 and the Upper Basin RODA for human health and ecological cleanup activities. It is also involved in the efforts by the Restoration Partnership to restore natural resources in accordance with their CDA Basin Restoration Plan and to coordinate efforts to protect the cleanup remedies, human health, and the environment from the release and migration of contaminants through the implementation and management of Institutional Controls in the Basin.

The Executive Director works with the seven governmental entities and their agencies to establish annual work priorities and operating plans, manages the activities and programs of the BEIPC, and assists governments on various engineering and environmental issues at their request. 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, the Coeur d’Alene Tribe and the Counties 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 with its Project Focus Teams (PFTs) is the BEIPC primary technical advisory group. It is comprised of federal, state, local and tribal representatives as well as interested private citizens serving on the PFTs 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 2017, the Executive Director and TLG developed the 2018-2022 Five-Year and Calendar Year 2018 draft work plans and studied and developed project and program proposals to implement the remedy in OU-2 and 3.

## *Public Outreach and Citizen Involvement*

### **Community Involvement**

During Calendar Year 2017, the BEIPC held meetings and deliberations open to the public and maintained an up-to-date Basin website at: [www.basincommission.com](http://www.basincommission.com). Meetings were held at various locations within the Basin with locations and dates announced on the website, in local newspapers, flyers posted throughout the community and at the BEIPC office in Kellogg, Idaho. EPA, IDEQ, and the BEIPC held a number of community meetings to discuss proposed project work in the Basin and Box. The BEIPC also participated in public education/outreach efforts including the joint information booth at the North Idaho Fair, and the Gear UP Career Fair at Lakeside High School for Jr. and Sr. High students in Plummer, Idaho.

### **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 politically and geographically diverse members and was established to provide local citizen review and input on Basin related work to the BEIPC.

## **CCC Meetings and Communication**

The CCC facilitated communications to its members and the public on an as-needed basis by e-mail, flyers, newspaper ads, and posting to the BEIPC website and EPA Facebook. CCC meetings were held in January, May, July, and October, 2017 in different locations around the Basin. All meetings were open to the public. CCC members were invited on the August tour of project work and issues in the Lower Basin.

At the regular CCC meetings, members were updated on ongoing BEIPC and agency activities and asked to provide input on a variety of issues such as how information is best distributed to residents in the Basin, and the one and five-year BEIPC work plans. The CCC informed the BEIPC of its activities by providing meeting summary notes of presentations, discussions, and comments to Commissioners prior to BEIPC meetings and by the CCC Chair making reports at BEIPC meetings. Throughout 2017, the CCC has arranged for transmission of information to its members and the public regarding activities in the Basin.

## **Chronology of Selected CCC Activities and Input to the BEIPC in 2017**

In addition to receiving various reports for review and comments, CCC members were involved in the following BEIPC activities in 2017:

### **January**

The CCC held a January meeting in Coeur d'Alene, Idaho. The Situation Assessment observations and recommendations were reviewed concerning the operation of the CCC and BEIPC. The discussion was facilitated and the facilitator gave a summary of the results of the meeting to the Executive Director for presentation at the February BEIPC meeting. The Restoration Partnership presented an update on the natural resource restoration planning process and the Draft Environmental Impact Statement and Restoration Plan.

### **February**

The CCC Chair reported on the January CCC meeting at the February BEIPC meeting in Coeur d'Alene, Idaho. Summary notes of the January CCC meeting were included in the meeting packets and posted on the BEIPC Web.

### **May**

The May CCC meeting was held in Kellogg, Idaho prior to the afternoon BEIPC Meeting. There was a discussion on how the BEIPC Staff was formed and the recommendations that came from the current four members comprised of agency representatives, to enhance the operation of the CCC and BEIPC. There was also a discussion on the role of the BEIPC in the overall decision making process in the Basin and the need for County representation on the Staff. Spring flooding issues and the institutional controls program were covered and there was a discussion concerning the repository work in Burke Canyon (Canyon Creek) as well as an update on the Healthy Communities Workshop held in Pinehurst. There was continued discussion on operations at the BEIPC meeting later that afternoon.

### **July**

The July CCC meeting was held in Harrison, Idaho. There was general discussion on CCC member and meeting attendee issues, an update on nutrient loadings and concerns for CDA Lake, EPA updates on Lower Basin cleanup activities, an update on the Robinson Creek wetland restoration project and natural resource restoration activities in the CDA Basin.

### **August**

CCC members were invited to the BEIPC Site Tour on August 16, and a number attended along with TLG Members, federal, state, and local government officials, members of the public, press, and the Idaho Congressional Delegation. Summary notes of the July CCC meeting were included in the meeting packets.

## **October**

At the October CCC meeting in the CDA IDEQ office, the IDEQ Lake Management official reported on the trends and oxygen levels in the CDA Lake. There was some discussion concerning the pending Our Gem Symposium and the Spokane River Forum in November. There was discussion about tracking future work noted in the BEIPC work plans and the draft 2018 Annual Work Plan and new Five Year Work Plan were presented by the Executive Director (ED). The ED reviewed the process for input into the operations of the CCC and BEIPC and presented a paper he had prepared after his review of all of the recommendations and comments. He also indicated that many of the recommended actions have already been implemented.

## **December**

At the December BEIPC meeting, the CCC Chair and ED discussed the recommendations and comments concerning the operation of the CCC and BEIPC and the BEIPC Board voted to implement some of the recommendations. Summary notes of the October CCC meeting were included in the meeting packets.

## **Additional Outreach Activities**

In addition to the activities of the CCC, the various governmental entities represented by the BEIPC continue to support the TLG and CCC by being involved in the activities of those groups. The governmental entities have been involved in outreach activities including meeting with citizen groups, giving technical presentations, participating in Basin events, holding tours of Basin project areas, maintaining information posting 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 the public outreach program, the Basin Commission ED continued to make 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. The ED also hosted the tour of projects in August by interested parties.

## **BEIPC Communications and Public Involvement**

In 2017, the BEIPC continued its efforts to strengthen public involvement in BEIPC activities and communication between the Basin community, the BEIPC, and agencies involved in the cleanup. The CCC continues to be the focus organization to help implement this process.

The following is a partial list of BEIPC community involvement activities throughout the year:

- Participated in public education/outreach efforts in a joint booth with IDEQ, EPA, CDA Tribe, and PHD at the North Idaho Fair.
- Coordinated a field tour of sites in the Lower Basin for the Basin Commissioners, agency representatives, and citizens in August. Participants viewed the Central Treatment Plant area and the dredge pool at the Cataldo Boat Ramp; discussed recreational and residential recontamination issues at the Rose Lake Boat Ramp, off channel flows through Killarney Lake and Strobl Marsh at Killarney Lake, test plots at Lane Marsh, the newly constructed Robinson Creek wetland at the wetland, and Black Lake issues at Black Lake.
- Provided assistance to BEIPC groups and staff on communications material including presentations, brochures, news articles, displays, banners, and advertising.

- Publicized BEIPC and CCC meetings by posting the dates and agendas to the BEIPC website, newspaper public notices and advertising, and through electronic media and distribution of informational flyers with assistance from EPA and IDEQ.
- Sent out reports and activities updates, CCC meetings and BEIPC meetings as well as BEIPC work plans to CCC members by email for review and comment.
- Shared BEIPC related information with the Community Involvement Coordinators (CICs) of EPA, IDEQ and the Lake Management Plan (LMP) staff for publication on their Facebook pages.
- Continued efforts to populate the BEIPC website with new information about BEIPC related activities and other information as requested by various agencies and advisory groups. The website provides information to keep the public informed including how to become involved and participate in the process; and opportunities for the community to provide input. Updates, including agendas and summary minutes of Basin Commission quarterly meetings, and CCC meeting summary notes are posted to the BEIPC website at [www.basincommission.com](http://www.basincommission.com).



**North Idaho Joint Fair Booth Blue Ribbon Award**





### **BEIPC August Field Tour, Cataldo Mission Boat Ramp**

#### **EPA Community Involvement Activities**

Coordinating with local communities and residents is a priority for EPA Region 10. The cleanup team wants to give people meaningful opportunities to be involved in and informed about the cleanup. Many of EPA's community involvement activities are done in partnership with others, including the IDEQ, BEIPC, and PHD. Highlights for the year include:

- The EPA continued to follow its Community Involvement Plan for the cleanup. The plan lays out how community members can get information and be involved, and summarizes local concerns and input. It also outlines how the EPA collaborates with its partners. Many local people helped develop this plan.
- The EPA and its partners conducted several Remedy Protection projects working closely with local jurisdictions, community members and property owners that will help protect completed cleanup work. Agency fact sheets, door-to-door communications, and other outreach efforts have been ongoing. Local jurisdictions are also especially involved with public outreach.
- The agency, in coordination with its partners, conducted outreach on several projects this year including: updating the "Healthy Living in the Silver Valley and Coeur d'Alene Basin" guide; convening the "Partnering for Healthy Communities Workshop" for environmental and health organizations serving the CDA Basin; public outreach for the Upper Basin Success Mine cleanup and Kellogg area groundwater collection system; lead health education; soil testing and property cleanups; recreation and health; Lane Marsh habitat restoration project; repositories; roads projects; and more.

- EPA released its final Bunker Hill 10-Year Implementation Plan, and its Recreational Sites Strategy this year. Public input helped shape both. The public was invited to review and comment on EPA's proposal to redevelop the SVNRT waste repository in the Canyon Creek area into the Canyon Complex Repository. The EPA hosted a Public Open House during the comment period and issued a Response to Public Comments on this project. The agency widely publicized this comment opportunity by using direct mail, newspaper ads, Facebook and website posts, email, local meetings and events, and so on.
- The **Coeur d'Alene Basin Facebook** page continues to provide site updates to the public. Find it at [www.facebook.com/CDAbasin](http://www.facebook.com/CDAbasin). The page offers site news, photos, and resource information. The EPA invites participation, suggestions, and postings.
- Publication of EPA's **Basin Bulletin** newsletter continues. Published three times per year, it provides news and updates about the Coeur d'Alene Basin Cleanup.
- The agency maintained its commitment to the BEIPC process throughout 2017. EPA provides staff support and regular participation at meetings of the BEIPC, CCC, TLG, and PFTs. As part of its ongoing support to the Basin Commission, the EPA also provided funding for an independent public involvement assessment for the Basin Commission in 2016. EPA continues to coordinate with the Basin Commission on follow-up to the assessment.  
(<https://semspub.epa.gov/src/document/10/100035028>)
- EPA is transitioning to a new website for the Basin Cleanup. It offers the public access to updates, site documents, and background information. Suggestions for improvements are always welcome. (New website URL: [www.epa.gov/superfund/bunker-hill](http://www.epa.gov/superfund/bunker-hill))
- EPA maintains document collections related to the cleanup at several area libraries and at the EPA Coeur d'Alene Field Office for public access.
- Project managers met several times with local officials, interest groups, and others to provide updates and answer questions in 2017. Additionally, EPA led site tours for interested parties, provided presentations to groups in the area, and staffed booth exhibits at local events. EPA also supported interagency exhibits about the cleanup at the Earth Day event, North Idaho Fair, and Shoshone Medical Center's Children's Health Fair.
- EPA regularly worked with the media in 2017, arranging a number of press availability sessions, fielding questions from reporters about the site, running newspaper display ads, and issuing press releases on high-interest activities.
- EPA's Community Liaison continued working with the community, serving as a resource for local residents. The EPA created this liaison position in response to requests for an on-site representative. The liaison is enhancing local communications, providing people with easier access to the agency, and helping the EPA to be responsive to local issues and questions.



## **IDEQ and PHD Community Involvement Activities**

IDEQ, along with PHD and EPA, conducts education, public engagement, and health awareness activities related to the CDA Basin Cleanup. Kellogg PHD is the primary partner for health messaging and outreach. The aim is to raise awareness about lead intervention and to support the continuation of healthy trends for children, families, and visitors to the area. The following are highlights of 2017 activities:

### Education related activities:

- PHD provided Lead Health Prevention Education to 926 K-3 students.
- Developed a new house dust brochure.

### Other community presentations and events:

- IDEQ, PHD and EPA staff provided a booth at Shoshone Medical Center's Children's Health Fair. Agency staff interacted with about 400 community members regarding recreation and health education in the Coeur d'Alene Basin.
- BEIPC, PHD and EPA hosted a booth at the Gear UP Career Fair at Lakeside High School in Plummer, ID.
- PHD attended and helped judge scientific research projects at the Youth Water Summit held at North Idaho College. Approximately 215 students attended.



**Shoshone Medical Center Children's Health Fair**

## Calendar Year 2017 Work Accomplishments

### Part 1 -

### Work Performed Through Federal Superfund or Other Cleanup Programs:

#### Blood Lead Screening in Children

Screening of children for elevated blood lead levels has been occurring annually in the CDA Basin since 1996 as a public health service to identify children with elevated blood lead levels and to provide follow-up from a public health professional to identify ways to reduce lead exposures. The screening program also informs the Basin cleanup efforts although cleanup decisions are not based on annual blood lead testing results. The goal is to prevent lead exposures that could result in elevated blood lead levels.

The following table shows the Basin Blood Lead summary results from 2008 – 2017 for children residing in the Basin 6 months to 6 years of age.

Year	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Number of Children	73	175	108	75	83	92	77	94	70	105
Min (µg/dl)	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.0
Max (µg/dl)	14.0	10.0	20.0	12.0	8.0	16	11	13	9	20
Ave (µg/dl)	2.4	3.1	2.5	3.1	3.3	2.8	3.1	3.2	3.2	4.3
GeoMean (µg/dl)	2.1	2.7	2.1	2.6	3.1	2.5	2.9	2.8	2.9	3.5

In early 2012, the Centers for Disease Control & Prevention (CDC) changed its “level of concern” associated with childhood lead poisoning from a blood lead level of 10 micrograms per deciliter (µg/dl) to a new “reference value” of 5µg/dl. The new lower value means that more children will be identified as having lead exposure allowing parents, doctors, public health officials, and communities to take action earlier to reduce the child’s future exposure to lead.

In 2017, twenty-three of the one hundred five children who participated in the annual summer Basin screening were identified with a blood lead level greater than 5µg/dl. PHD contacted all families of children who had a child with a blood lead level equal to or greater than 5µg/dl to provide information on how to reduce exposures, offer free in-home environmental consultations, and to offer follow-up screenings. Of the fourteen families identified in the Basin only two participated in environmental consultations. These in-home consultations help PHD and individual families identify ways to reduce the risk of exposure and detect potential sources in or around the home. In addition, they can help distinguish exposure pathways the larger project can focus on to reduce blood lead levels. The annual 2017 screening was conducted in August, as compared to July in previous years. This is a likely contributor to the higher blood lead levels documented in 2017, as having the screening later in summer allows for a greater exposure period. In addition, above average temperatures and below average precipitation increased dustiness and recreation along un-remediated portions of the Coeur d’Alene River, especially its South Fork. The blood lead screening program offered a \$30 incentive in 2017 for children between ages 6 months to 6 years of age residing within the Basin; this will be continued for 2018.



## Basin Property Remediation Program (BPRP)

Year	Number of Property Addresses	Area Remediated (Acres)	Waste From BPRP Disposed of in Repositories ( Truckloads)
2007	373	60	9,240
2008	352	57	8,129
2009	547	149	18,780
2010	311	70	10,725
2011	243	64	9,795
2012	216	73	9,127
2013	128	44	3,500
2014	95	30	3,647
2015	82	37	3,069
2016	74	23	2,692
2017	48	20	1,062

The CDA Trust BPRP collected a total of 1,515 soil samples and 2 vacuum dust samples from 65 residential and commercial properties throughout 2017. In addition, 97 private drinking water system samples were collected from 30 properties.

The targeted house dust mat sampling program was transferred to the CDA Trust in 2017. A total of 1,551 door-to-door visits at 1,165 properties were conducted to request participation in the program. Dust mats were placed in 302 residences and vacuum samples collected from 100 residences.

The CDA Trust BPRP remediation program completed a total of 48 residential and commercial properties in 2017. The construction season started on May 18<sup>th</sup> and finished on November 13<sup>th</sup>. The remedial contractor remediated a total of 20.21 acres.

Five existing reverse osmosis under-sink water filtration systems treating drinking water from private sources were replaced in 2017 by the CDA Trust. In addition, two new systems were installed. IDEQ and the CDA Trust continued to replace filters and membranes in existing systems on a regular basis.

In addition to the work noted above, IDEQ managed remediation at two properties in the Box whose owners changed from refusing access to allowing cleanup work to proceed.



### **Property Surface Excavation Prior to Clean Barrier Installation**

## **Remedy Protection Projects**

Remedy Protection is a high priority in the Upper Basin RODA and the SCIP developed by EPA in the fall of 2012. The objective of this work is to protect the installed human health related remedy from recontamination and scouring caused by heavy precipitation and tributary flooding. In 2012, planning, survey and design began on a number of projects in the urban areas of the Box and Upper Basin portion of OU-3 noted in the RODA. IDEQ completed Remedy Protection work in the Box in 2015.

In 2017, the CDA Work Trust worked on the Tiger Creek in Mullan design and began evaluation of the Star Parking Area in the Canyon Creek drainage. The CDA Work Trust also completed designs for the following Basin projects in 2017:

- Rosebud Gulch in Osburn
- Hunt Gulch (Valley View Road) near Kingston.

The CDA Trust worked on construction of several projects in 2017:

- Started and completed the Hunt Gulch (Valley View Road) project near Kingston,
- Completed construction of the Mill Creek project with a majority of 2017 work occurring in the upper portion of Mill Creek through Mullan
- Completed the Copper Street/Boulder Creek project in Mullan.





**Completed Mill Creek Remedy Protection Project in Mullan**



**Completed Copper Street Storm Drainage and Paving**

## **Paved Roadway Surface Remediation Program**

EPA and IDEQ implemented the roadway surface remediation program in 2013 to address the deterioration of contaminated paved road surfaces due to heavy traffic during site remediation activities to ensure road surfaces continue to serve as barriers that reduce or eliminate exposures to underlying contamination. There were 593 road segments to be remediated in the original program Strategy; the EPA/IDEQ Roads Board has added approximately 13 segments to date that were not identified in the text of the Strategy, but were identified as qualifying in supplemental information, specifically road maps, as qualifying for remediation in the program. Several roads segments previously included in the Strategy have been disqualified because they have just recently been rebuilt, and hence were not in need of work, or they were under the jurisdiction of State of Idaho Transportation Department who does not qualify for funding in the program.

The local road jurisdictions have completed reconstruction of 437 roadway segments to date. Many of these projects were completed in coordination with remedy protection projects and major subsurface utility projects in Mullan, Wallace, and Kellogg, which were funded by public utilities or through local bond elections and USDA Rural Development grants. In spite of the obvious cost effectiveness of the joint ventures between roads and subsurface infrastructure projects, Wallace and Kellogg remain behind their contract schedules for completion work.

Approximately 74% of the roads segments have been remediated at a cost of less than 60% of the original \$54 M allocated to complete the program. At the end of the 2016 construction season the East Side Highway District, Smelterville, and Wardner had completed all of the roads on their roads lists. Due to the addition of an added roadway segment in Pinehurst and a delay in obtaining a Local Matching Grant for a structure in the Shoshone County Box, these jurisdictions should now complete their Roads Program in 2018. Osburn, Wallace, and Mullan should also complete their programs by the end of 2018. Work in the City of Kellogg will continue into 2019 with substantial construction projects that are joint ventures between roads remediation and subsurface utility replacements. If completed in 2019, the Paved Roadway Surface Remediation Program will have been completed three years ahead of the 2012 projected 10-year schedule.





**Typical Removal of Existing Pavement and Base Preparation, Osburn**



**Completed Lower Page Road, Shoshone County**

## **Prioritization of Mine and Mill Sites Based on Potential Human Health Risks**

More than 1,000 mine and mill sites are catalogued for the Bunker Hill Superfund Site. Since full characterization of all of these sites would be a lengthy process, 105 sites that might pose a threat to human health were identified for potential prioritization. From 2014 to 2016, field crews visited 75 mine and mill sites in the Upper Basin and 22 sites in the Box. Their task was to characterize remaining contamination that may require cleanup to protect human health.

During 2017, these findings were used to identify and prioritize 35 sites requiring further action to address human health risks. Further actions may begin with additional characterization to determine the need for remedial action. These sites were referred to the following programs based on location (Box or Basin) and type of use (residential or recreational): Basin Mine and Mill Group, Human Health Risk Management Group, and Recreational Sites Program. Although some sites were rated as a low priority based on the current observations, this status may change in the future based on changes in site use (e.g., new residential buildings, new recreational uses, etc.). Human health concerns may be re-evaluated based on these changes.

In addition, 84 mine and mill sites were identified in drainage basins upstream of four public drinking water system intakes. Field crews characterized surface water upstream of the intakes and directly after treatment for each drinking water system. Results show that impacts of mining-related activities and remaining historic mine wastes are minimal. This evaluation of source water was completed by IDEQ and EPA with coordination and support from the IDEQ Source Water and Drinking Water Programs, IDEQ Coeur d'Alene regional office, and local water systems.

## **Repository Development and Management**

### **Introduction**

Repository development and management is an ongoing process that must meet the demand for the disposal of historic mining related contamination for the entire Basin environmental and human health related cleanup program. The cleanup program includes the BPRP, and other cleanup actions performed by EPA through the Trust or IDEQ. It also includes waste generated by private parties and local government agencies under the ICP and Paved Roads Program. Without the expansion of existing repositories or the construction of new repositories, continued cleanup and control of contamination could be compromised and potentially stopped.

The Upper Basin RODA specifies a two-part approach to waste management that utilizes both repositories and Waste Consolidation Areas (WCAs). Repositories are large, centrally located areas within the Upper and Lower Basin where contaminated soil and material excavated during cleanup actions is transported to be managed and secured. WCAs will be located adjacent to or near the waste source areas and will serve for consolidation or placement of wastes from specifically identified sources such as mine and mill site remedial actions. Repositories and WCAs (see the Upper Basin remedy section for more on WCAs) constructed under the remedy are engineered and constructed to reliably contain waste materials, and prevent contaminants from being released to surface water, groundwater, or air in concentrations that will cause state and/or federal standards to be exceeded.

A third waste management approach was adopted in 2014 following public review and comment called the Community Fill Plan (CFP). The CFP was developed in recognition that the ICP allows use of contaminated soils for fill and the need for fill material to create more developable ground in the Upper Basin. Use of the CFP will take place under agreement between a generator and a property owner with

space for fill, but must be approved by the PHD in compliance with the ICP. PHD must seek approval of EPA and IDEQ for any CFPs proposed to dispose of 5,000 cubic yards (cy) or greater. One CFP was developed in 2016. The Government Gulch CFP was established directly adjacent to the Government Gulch Limited Use Repository (LUR) for the purpose of accepting ICP waste from collaborative projects involving sewer, water supply and other utility replacements and upgrades within the City of Kellogg.

A fourth waste management approach takes advantage of the relatively low volume of base materials excavated during the paved roads projects, and their inclusion with the relatively inert asphalt or Portland cement concrete which makes up 30 – 50% of the wastes generated when roads are torn up for remediation. Three LURs accepted road waste material in 2017; the Shoshone County Transfer Station, the East Zanetti Yard, and the Government Gulch LUR. LURs will take advantage of the roads waste physical characteristics which, when placed properly, make it a moderate quality construction fill. LURs have all of the engineering controls used in larger scaled repositories, but are “limited” to the type of fill (roads waste) and duration of time (2-3 years) before they need to be closed, capped, and covered. The three primary goals for constructing LURs are: 1) the economy of disposing low toxicity wastes in places close to roads projects, 2) conserving repository space for more contaminated remediation waste, and 3) increasing the developable space inventory in the Upper Basin.

Five repositories were operated to receive remedial action and ICP waste in the 2017 field season. Big Creek Repository (BCR) and Big Creek Repository Annex (BCRA) near the community of Big Creek and Lower Burke Canyon Repository (LBCR) serve the Upper Basin, and East Mission Flats Repository (EMFR) near Cataldo serves communities in the Lower Basin. The Page Repository, located near Smelterville receives the ICP and remedial action wastes generated by the cleanup activities conducted in the “Box.” EMFR, BCR, BCRA, and LBCR are operated by the Trust. Page is operated by IDEQ. Both IDEQ and the Trust directed waste to the repositories to minimize transportation distances and costs. In addition, the Page Repository continues to use recycled construction materials extracted from Basin and Box waste streams which helps to further reduce repository operating costs. A summary of activity at each site is described in the sections below.

### **Big Creek Repository**

During 2017, BCR received limited quantities of waste. Waste streams delivered to BCR were directed to BCRA as the Trust site management contractor prepared the west slope of BCR for the installation of soil test plots. The purpose of the soil test plots is to develop options for the final vegetated cover system for the BCR. Five test plots were constructed to approximately 0.39 acre in size, placed on the west slope with all test plots having the same aspect. The test plots are separated by silt fence and construction fencing with straw waddles placed on the slope as a Best Management Practice (BMP). Each test plot received different ratios of soil amendments that included lime and compost. Each test plot was hand broadcast seeded with a Bonded Fiber hydro seed applied for erosion control and winterization. The options implemented will be compared and evaluated based on their individual cost-to-coverage ratios. This may allow for a simplistic means of evaluation. In 2016, the water quality monitoring program at the site found that BCR operations had not impacted adjacent surface or ground waters.

The year-end repository shutdown activities have been completed and include:

- All road surfaces were graded and sloped inward to collect runoff to capture runoff and prevent ponding.
- Additional storm water management controls including straw waddles and hydro-seeding with a native seed mix were installed on finished slopes to further protect against erosion of these surfaces.



At the end of the 2017 construction season, the BCR contained approximately 600,800cy of waste soils. BCR currently has approximately 130,000 compacted cy of capacity left for disposal. The ICP area will be managed by the Trust's Operations Contractor during the winter closure period. Prior to spring runoff, all ICP waste will be transported and stockpiled on top of the repository for processing and future placement and compaction.

### **Big Creek Repository Annex**

Development of the BCRA was completed in 2015 and the repository opened to take remedial and ICP waste. In 2017 BCRA received 65 truckloads from the BPRP, 468 from the ICP, and 10 from the Paved Roads Program for an estimated 5,158 cy of waste placed in 2017. The Annex capitalized on being able to use the existing infrastructure at BCR such as the main entrance and wash station.

### **Mullan ICP Disposal Area**

The Mullan ICP Disposal Area has served as the local repository for activities conducted in the City of Mullan. However, because the disposal area is now effectively full, it is being closed though a transfer station will remain on site. The transfer station ensures that future local ICP wastes get disposed of in an engineered facility (e.g. BCRA or Lower Burke Canyon Repository), and local ICP users can continue to use the facility as they are currently accustomed. The Disposal Area was capped in 2017 and left for the City to maintain. Following construction, the transfer station will only accept ICP waste from Mullan residents. The Trust will operate the transfer station for the foreseeable future.

### **Shoshone County Transfer Station LUR**

The Shoshone County Transfer Station Limited Use Repository (LUR) is designed as a permanent disposal location for waste material generated by the Paved Roads Program. This design provides for a disposal capacity of approximately 22,240 cy of material.

The Transfer Station received 889 truckloads of road waste for an estimated 8,400 cy of waste placed in 2017. When complete, the Shoshone County Transfer Station LUR will provide two flat surfaces (0.4 acres and 3.45 acres) to be utilized by Shoshone County.

### **East Zanetti Yard LUR**

The East Zanetti Yard Limited Use Repository (LUR) is designed as a permanent disposal location for waste material generated by the Paved Roads Program. This design provides for a disposal capacity of approximately 28,500 compacted cy of material. East Zanetti Yard received 793 truckloads of waste from the City of Osburn for a total of 7,500 cy waste placed.

When complete, the East Zanetti Yard LUR will provide 5 acres of additional flat land to be used only for commercial development.

### **Government Gulch LUR**

Waste placement at the Government Gulch LUR began in 2015 and IDEQ has continued fill placement with waste generated by the Paved Roads Program. Closure of the first cell is expected to occur in 2018 to support redevelopment of approximately 6 acres of land. In 2017, the Government Gulch LUR received 3,068 truckloads or approximately 29,000 cubic yards. IDEQ completed the design of a second cell which will provide an additional 30,000 cubic yards of capacity north of the existing LUR and CFP areas in Government Gulch. The second cell will also be filled in a manner that promotes future development of the property along Government Gulch Road.





## **Placing Paved Road Program Waste Material at Government Gulch LUR**

### **East Mission Flats Repository**

In 2017, the EMFR repository received 395 truckloads from the BPRP, 343 truckloads from the ICP, 373 truckloads from roads program, and 19 truckloads from Remedy Protection Projects. Final in-place, compacted volume calculated from the truck load count was about 10,170 cy. As in the past, the ICP disposal area will be available at the east end of EMFR to receive ICP waste during the winter closure period. The ICP area will be managed by the Trust's Operations Contractor during the winter closure period. Prior to spring runoff, all ICP waste will be transported and stockpiled on top of the repository for processing and future placement and compaction.

Semiannual groundwater monitoring was conducted at six monitoring wells located on or near EMFR. Groundwater and surface water monitoring results indicate that disposal activities have not impacted water quality near the site.

### **Lower Burke Canyon Repository**

During 2017, LBCR received 602 truckloads from BPRP, 1,462 truckloads from the ICP, 251 truckloads from Remedy Protection Projects, and 31 truckloads from Paved Roads Projects, for a total waste placement of 22,300 cy. Starting immediately after the last of these wastes were received the slope was stabilized and hydro seeded. The year-end repository shutdown activities have been completed and include:

- Create low area sump near decontamination pad to ensure that runoff from the asphalt area is contained on site.
- Construct drainage swale around south end of fill limits to collect any runoff during rain on snow events.

- Crown center of waste area to encourage drainage to runoff collection ditches.
- Additional storm water management controls were installed including straw waddles and hydro-seeding with a native seed mix on finished slopes to further protect against erosion.

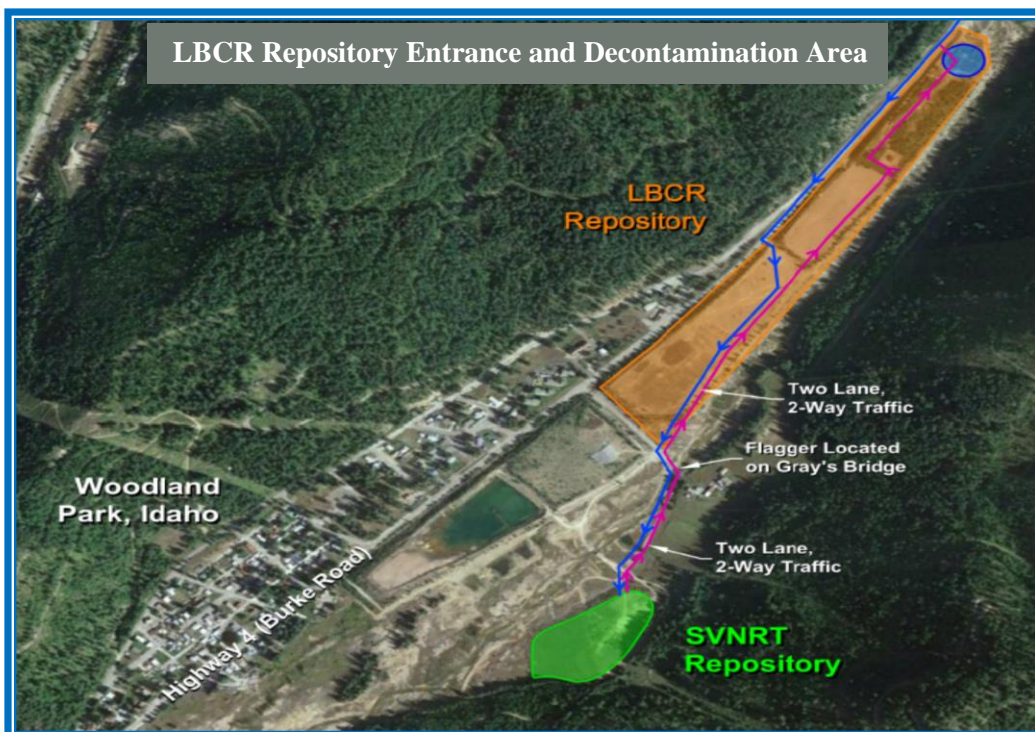
### **East Fork of Ninemile Creek Waste Consolidation Area**

During 2017 the East Fork WCA received 146, 075 cy of waste from the Success Mine Complex Dump. Additional work conducted at the WCA included expansion for additional capacity and continued generation of soils for future capping and repairs. To date, the East Fork WCA site has generated approximately 170,000 cubic yards of rock and 250,000 cubic yards of soil for East Fork Ninemile Creek Remedial Actions. This has saved the project approximately \$8.4 million and significantly minimized traffic through local communities.

### **Additional Disposal Locations**

In addition to the operational repositories, two separate areas for future disposal and permanent storage of mining related contamination are currently in some stage of consideration and/or planning. The repository site selection process initiated in 2008 culminated in the identification of two new repository sites in the Upper Basin; the Osburn Tailings Impoundment (OTI) near Osburn and the Lower Burke Canyon Repository (LBCR, formerly the Star Tailings Impoundments). The LBCR is currently accepting waste and the Osburn Tailings Impoundments will be considered for use in the future depending of disposal needs.

A second location currently under development is the Canyon Complex Repository (CCR). The location of the CCR is the former Silver Valley Natural Resource Trustee Repository (SVNRT) location near the LBCR. Based on waste projections, additional disposal capacity was required in Burke Canyon and the SVNRT site ranked high using the site selection criteria used in 2008. Use of the SVNRT site will prevent transporting waste through downstream communities. In April, the CCC hosted an open house to kick-off a 30 day formal public comment period on the 30% design. EPA issued a formal response to the numerous comments and the final design will incorporate many of these comments. Also, in September 2017 investigations were conducted to support the Canyon Complex Repository design.







**Typical Truck Decontamination After Dumping at Repositories**



**Waste Consolidation Area in East Fork 9 Mile Canyon**

## Upper Basin Remedies

### Cleanup Actions in East Fork Nine Mile Creek (EFNM)

In 2017, remedies in the EFNM Creek Basin consisted of the following:

- Operations and maintenance (O&M) of the Interstate Callahan Mine Rock Dumps, Rex Mine No. 2, and infrastructure to support remedial actions (RAs).
- Construction of the second year of the Success Mine Complex RA project.
- Operation of the EFNM Waste Consolidation Area (WCA).
- Continued surface water monitoring in EFNM Basin.
- Completion and implementation of the Success Mine Complex Adit Memorandum, which includes historical research and a vibration study near and around adits.
- Continued work to address all applicable regulatory requirements including compliance with the National Historic Preservation Act, Endangered Species Act, and Clean Water Act.
- Completion of design at the Interstate Mill Site, which included installation of three monitoring wells and fourteen piezometers.

The following summarizes the 2017 construction activities conducted in the EFNM Basin:

- Approximately 146,075 cy of contaminated waste rock and mine tailings were hauled from the Success Complex and placed and compacted at the EFNM WCA resulting in 113,256 compacted cy at the WCA.
- Approximately 7.7 acres of remediated steep slope at the Success Mine Complex were covered and revegetated.
- Placement of temporary cover materials over contaminated waste rock and mine tailings at WCA prior to winter shutdown.

The above projects within the EFNM Creek Basin employed approximately 35 workers during the 2017 construction season, over 80% of which were local.

### Central Treatment Plant (CTP)/Groundwater Collection System (GCS)

The Corps of Engineers awarded the Design/Build/Operate Contract to AMEC/Foster Wheeler (AMEC) on December 15, 2016 and issued the Notice to Proceed on February 2, 2017. AMEC assumed the responsibility for the continued operation of the existing Central Treatment Plant (CTP) on May 2 following a 65 day transition period and will continue to operate it until 1 year after the completion of the upgrades to the plant and construction of the Groundwater Collection System (GCS). AMEC responsibilities also include design of the CTP upgrades, the new GCS and a new lined Sludge Impoundment on top of the Central Impoundment Area (CIA). The Corps of Engineers (COE) is charged with administration and management of the contract. Since issuance of the Notice to Proceed AMEC has been busy finalizing design packages and submitting work plans, investigating site conditions and surveying the construction areas. In late summer and early fall, contractor crews constructed drill pads, installed control wells for the GCS, performed pilot tests of CTP filter systems, collected cores in the CIA to support the geotechnical analysis of the CIA and installed bypass piping necessary to accommodate demolition and temporary treatment systems that will be on-line in 2018. Concurrently, design packages and work plans have been finalized and submitted to the COE with the last of the packages due in early 2018. During the 2018 construction season, AMEC is scheduled to start constructing the GCS and CTP upgrades. Tasks will include removing billboards along the CIA, installing new CTP components and demolishing the replaced CTP components and constructing the new sludge impoundment, power,



ventilation and control systems. Work will also begin on the soil/bentonite cutoff wall that will be constructed between the CIA and the South Fork CDA River. Construction activities are scheduled to be completed in 2019 and 2020 and following completion will undergo testing and acceptance prior to being operated for 1 year under this contract.

The CTP upgrades are necessary to treat additional influent flow from the GCS, improve system reliability, meet current more stringent discharge requirements, and operate in High-Density Sludge (HDS) mode. These upgrades have been necessary for some time to provide dependable and more efficient water treatment of the Bunker Hill Mine water, and the groundwater to be collected from the GCS near the CIA. The Bunker Hill Mine water has been and continues to be treated at the CTP. The upgraded CTP will be designed to treat influent flows at rates that nearly triple the current rate of base flows from the Bunker Hill Mine. Excess flow from the Bunker Hill Mine will be diverted to in-mine storage. The plant is currently not capable of meeting discharge standards when being operated in HDS mode, the upgraded plant when operating in HDS mode will result in much less sludge production, more efficient operating conditions, and the need for fewer sludge ponds being constructed over time. Following treatment, the effluent discharged from the CTP to the SFCDA River will be required to be in compliance with current water quality standards. On an average basis, the GCS is expected to result in significant removal of dissolved metals, the most notable of which is zinc that is currently being discharged to the SFCDA River from groundwater interaction, as discussed in the following paragraph.

The design includes an approximate 8,000-linear feet cutoff wall between the CIA and Interstate 90 (I-90), a series of extraction wells, and a conveyance pipeline to the CTP that extends along the north side and over the top of the CIA. Groundwater flow and strength (concentration of metals) predicted by the mathematical model represents the range from base flow/strength through maximum flow/strength. Base flow/strength typically occurs in late summer or early fall and maximum flow/strength typically occurs during spring runoff. By considering seasonal and annual variability and groundwater monitoring well data from south of I-90, the estimated dissolved zinc loading to the gaining reach of the SFCDA River ranges from 150 to 450 pounds per day (lbs/day). A significant unknown is the potential source of metals in tailings under and north of I-90 that will not be captured by the groundwater collection system. However, the optimistic target is to capture up to 90% of the predicted load to this gaining reach from south of I-90.



**Drill Rig Working on Ground Water Collection Project at the CIA**





**Remediated Success Mine Complex Dump**



## Lower Basin Remedies

The cleanup described in the 2002 OU-3 ROD for the Lower Basin includes actions for the wetlands and lateral lakes, the river banks, splay areas and river bed. These remedial actions, envisioned primarily as pilot studies, are being evaluated for implementation under the 2002 OU-3 ROD. The objectives of remediation in the Lower Basin are focused on reducing risks to human health and wildlife by reducing exposure to particulate lead and improving habitat quality in the CDA River system. Remedies that address human health or ecological exposure, coupled with continued evolution of our understanding of sediment transport and recontamination in the Lower Basin, are interconnected with natural resource restoration actions.

Health Intervention Program projects lead by IDEQ and Kellogg PHD continue to be relevant and meaningful Basin-wide. Projects aim to lower human exposure rates to heavy metals through educational outreach. With help from partnering agencies, a number of efforts were undertaken in 2017 including airing radio announcements, staffing informational booths, and providing educational presentations to school students. This purpose of these activities was to provide health tips to recreationists. Long-term planning for addressing Human Health Risks as a result of recreational activities at dispersed sites in both the Lower and Upper Basin is described in the Recreation Sites Section of this Report.

EPA continued two pilot projects initiated in 2015 to evaluate wetland mitigation options. Thin-layer capping is one method considered promising for sensitive wetlands to cost-effectively reduce ecosystem impacts from contamination while limiting the hydraulic effects of remedial actions. In October 2017, EPA added another layer of material to the test plots that were installed in 2016 and created a new, expanded (less than ½ acre) test area to evaluate application techniques and apply clean native material obtained from the Robinson Creek restoration project. During the summer, EPA installed two data stations to measure changes in soil characteristics throughout the year and collected additional samples for geochemical analysis to guide further research on sediment treatments that may reduce the bioavailability of lead to waterfowl.

Additional opportunities to reduce human exposures in the Lower Basin will continue to be considered concurrent with the model development and evaluations of remedial options.

Development of the sediment transport model was completed in 2017, including calibration, validation and several tests of the sensitivity of specific model parameters. In general, modeling results show good agreement with measured rates of sediment flux and floodplain deposition. The model documentation report for the 2D hydraulic and sediment transport model is almost complete and will be submitted for peer advisor review in the 1<sup>st</sup> quarter of 2018. The sediment transport model, in concert with the previously developed one- and two-dimensional hydraulic models of the Lower Basin, provide a valuable suite of tools for simulating existing and possible future conditions, and for prioritizing and evaluating remedial options.

In March, EPA contractors and the USGS were on the water and the bridges over the Coeur d'Alene River collecting water samples during the high water event that occurred March 15-20. Grab samples were collected and analyzed for sediments and metals concentrations from two boats and Laser In-Situ Scattering and Transmissometry instruments were used to log sediment concentrations in the water column throughout the river downstream of the Bull Run Bridge (River Mile 153.5). The boat-based monitoring filled critical data gaps regarding locations where metals concentrations increase during high flow events. The bridge-based sampling conducted by USGS is part of the on-going depth integrated sampling and is a component of the Basin Environmental Monitoring Plan (BEMP) that has been conducted on the Coeur d'Alene River and continues to provide valuable information about metals and sediment concentrations in the water column at fixed locations. The results of this monitoring are documented in a Flood Stage Sampling Report that will be placed on EPA's website after internal review is concluded. The broader BEMP Sampling is described in greater detail in its own section.



An extensive network of floodplain sediment deposition tiles was monitored following the March high flow event and is used to document the rates and characteristics of deposited sediment, and data. The depositional sediment network will remain in place for the current water year, and flood stage suspended sediment sampling will be conducted if high flows occur in 2018.

Documentation of ongoing data collection and analysis being conducted to support the Enhanced Conceptual Site Model (ECSM) continued through 2017, with updates to the initial ESCM (EPA, August 2010) being prepared as work elements were completed. An evaluation and analysis of river bed morphology, with sediment and lead characteristics (TM E-6), was completed in June 2017 and was presented to the BEIPC board in late 2016 and again in August 2017 and distributed to stakeholders. These documents are available on EPA's website:

<https://cumulis.epa.gov/supercpad/cursites/csitinfo.cfm?id=1000195>

A characterization report of sediment particles (TM-E7), which affects contaminant mobilization, transport, and documentation of Historic channel Changes (TM-E4) were completed in 2017 and will be available on EPA's website early 2018. Other similar ECSM updates including historic plank dam affects, synthetic water surface elevation data and water level logger history documents are also being finalized in early 2018. Information being documented in the ECSM series helps in both decision making and the parameterization of the sediment transport model and will help guide the selection and design of pilot projects.

In December 2017, EPA completed a Strategic Plan that describes the requirements, goals, and objectives that are the framework for planning cleanup work in the Lower Basin. This document provides the basis for a structured decision making process that EPA has initiated, through a technical workgroup of stakeholders, to define objectives and potential projects, and to explore the trade-offs represented by various near term and long term actions within the Lower Basin. The Strategic Plan is considered a living document and will be available on EPA's website in February 2018.

EPA is not selecting new remedies for the Lower Basin through this strategic planning process, but prioritizing, evaluating and implementing actions that have been previously selected in the OU-3 ROD. The ROD provides a large degree of flexibility in how EPA chooses to approach development and implementation of remedies in the Lower Basin. EPA may also implement supplemental actions, which are not explicitly identified by the ROD; in such a case, EPA will evaluate the need for an Explanation of Significant Differences (ESD) or ROD amendment.

## **State of Washington Projects**

The Washington State Department of Ecology performed XRF analysis at each of the remediated beach sites along the Spokane River with encouraging results. Beaches closer to the Washington/Idaho border did see some higher metal concentrations as a result of new sediment deposition; however heavy metal concentrations still remain significantly lower than pre-remedial conditions. Visual observations were done at each of the sites and most were doing very well. Starr Site had a little sediment movement but the cap is still fully intact. At Island Complex approximately one third of the plantings have survived, but there also has been new sediment deposition. This is expected since Island Complex is the most upstream site as well as a backwater area. Recent high flow events have also moved sediment around quite a bit. Additional XRF data collection will take place in 2018 with a report coming out soon thereafter.



**High Flow Boat Based Sampling, Lower Basin**



**West Lane Marsh Test Plot**

## Recreational Sites

The goal of the Recreation Sites Program is to address and manage human health risks from exposure to lead and other metals while maintaining the benefits of recreation for people's health and the local economy. A strategy document was developed in 2016 to lay out ways to inventory recreation areas, possible ways to manage risks to people, and current outreach activities. This strategy was issued for public and stakeholder comments and suggestions. Responses to community input were compiled during 2017. The strategy and response to community input are available at: [www.deq.idaho.gov/playclean](http://www.deq.idaho.gov/playclean).

Also during 2017, the Recreation Sites Program, which includes EPA, IDEQ, PHD, CDA Trust, and CDA Tribe initiated development of an Implementation Plan for actions at recreation sites and continued to implement and expand outreach materials. Addressing contamination at dispersed recreation sites throughout the Upper and Lower Coeur d'Alene Basin is different than other cleanup activities. Many places are re-contaminated with each high water event or flood making it difficult to just remove contaminated soil and replace it with clean soil. Other dispersed recreation areas are remote, hard to access, and spread out, like hiking trails or ATV areas, making cleanup of the entire area difficult. Overall, different approaches are needed for the wide spread types and locations of recreation sites. Through the Implementation Plan process, many of these different dispersed recreational sites were identified.

## Basin Environmental Monitoring

In 2017, EPA completed a preliminary draft of the CDA Basin Environmental Monitoring Plan (BEMP) that will be finalized during 2018. The goal of the updated and optimized CDA BEMP is to provide a framework for designing efficient data collection plans to support site-wide management decisions. Specific monitoring goals include:

- Assessing long-term status and trends of contaminants in Site media;
- Evaluating the performance and effectiveness of the Selected Remedy;
- Providing data for CERCLA-required five-year reviews of the progress on remedy implementation;
- Evaluating progress toward Remedial Action Objectives (RAOs); and
- Improving understanding of Basin processes and variability to optimize subsequent remedial action implementation.

The CDA BEMP will incorporate the Site-wide Quality Management Plan (completed in 2015) and media-specific Quality Assurance Project Plans (QAPPs). A programmatic Data Management Plan for the Bunker Hill Site is currently under development that provides guidance and data requirements for all entities collecting environmental data at the Site. Human health-related data will not be included in this database. The database platform selected for this site is Scribe and the repository is the EPA Region 10 subscription to Scribe.net. EPA has been working with each entity that collects data for the Bunker Hill Site to migrate their data to the new Scribe platform and anticipates completion of this task by the end of 2018. During this period, stakeholders can make specific data requests to the EPA Remedial Project Manager.

One of the monitoring objectives under the CDA BEMP is remedy efficacy monitoring for specific remedial actions. In 2016, EPA prepared a Remedial Action (RA) Effectiveness Monitoring Plan for cleanup efforts in East Fork Nine Mile Creek (EFNM). During 2017, baseline monitoring was conducted at 24 stations in EFNM and 23 stations in Canyon Creek. A RA Effectiveness Monitoring Plan for the Groundwater Collection System (GCS) and Upgrades to the Central Treatment Plant (CTP) will be completed in early 2018.



During 2017, United States Geological Survey (USGS), IDEQ, USFWS, and EPA continued BEMP sampling. Specific activities are outlined below.

### **Surface Water**

In calendar year 2017, USGS collected 68 stream discharge and water-quality samples from 16 OU-3 and four OU-2 surface-water stations for a range of hydrographic events. Samples were collected during a winter storm in February, during the spring snowmelt runoff in May, during the hydrograph recession in July, and during base flow conditions in September. Each site was sampled between two and four times during the year. Samples were analyzed for nutrients, selected trace metals and major ions, and suspended sediment.

In addition, USGS performed bridge-based isokinetic sampling of the March 2017 flood event in coordination with EPA's flood stage sampling of suspended sediment. Sampling occurred at the Cataldo, Rose Lake, and Harrison stations during March 16 and March 17. These samples were analyzed for selected trace metals, nutrients and suspended sediment concentration (SSC).

Twelve of the 16 OU-3 stations are collecting continuous streamflow data and are telemetered with real-time streamflow access. Information can be viewed at <http://waterdata.usgs.gov/id/nwis/rt>

Two large winter flow events occurred February and March 2017. The March event was among the five highest flow events sampled in the last two decades, with flows exceeding 30,000 cubic feet per second (cfs) in the CDA River at Cataldo. Spring snowmelt runoff in May was similar in timing and magnitude to median runoff flows. Recessional samples were collected in July. Fall samples were collected in September 2017 and captured base flow conditions.

The USGS completed a seepage study in September 2017 to evaluate groundwater loading of dissolved cadmium and zinc to the SFCDA River between Kellogg and Smelterville prior to installing the GCS and performing upgrades to the CTP. The purpose of the September study was to take a "snapshot" of groundwater quantity and quality entering the river prior to installation of the cleanup system. The USGS collected 33 water-quality samples and 21 streamflow measurements on the SFCDA River and tributaries between Kellogg and Smelterville during the same time-period that IDEQ sampled groundwater wells throughout the CIA, providing direct measurements of groundwater levels and quality. By carefully measuring streamflow upstream and downstream of the CIA, and measuring tributary inflows, USGS can deduce how much groundwater enters the river in this area. The water-quality samples collected were analyzed for zinc, cadmium, phosphorus, and other constituents. The results will be used to understand how groundwater quality affects river water quality. Taken together, the flow and water-quality data will provide a detailed picture of how groundwater affects the SFCDA River before the groundwater cleanup system is installed. USGS plans to repeat the study in several years to see how the groundwater cleanup has improved river water quality.

All gaging station stream discharge and water-quality records for the BEMP gages for Water Year (WY) 2016 were worked up, approved, and included in the 2016 USGS annual data report for Idaho. The annual data summaries were completed and delivered to EPA during the first quarter of calendar year 2017. The USGS completed a Final Surface Water Quality QAPP in 2017.

### **Groundwater**

In 2017, IDEQ administered semiannual groundwater sampling within OU-2 of the Bunker Hill Box in accordance with the new and optimized BEMP QAPP for Groundwater Monitoring.

Groundwater sampling was conducted at 11 sites during May/June high flow conditions and 11 sites during September low flow conditions (in coordination with the USGS seepage study). In addition to measurement of typical field parameters, samples underwent laboratory analysis for dissolved metals

(antimony, arsenic, copper, cadmium, lead, and zinc) at all sites, total phosphorus for one site, and the remaining sites were analyzed for acidity, alkalinity, total dissolved solids, total suspended solids, anions, and o-phosphate.

Groundwater data were collected in both the fall and spring 2017 events for ongoing baseline monitoring in preparation for the installation of the GCS between the CIA and I-90. In the future, data analysis will also include estimating dissolved metal loads to the SFCDR, monitoring remedy performance and effectiveness, and evaluating long-term response to the collection system operation.

### **Biological Resources**

USFWS conducted waterfowl surveys from late February to late April 2017 in Lower Basin floodplain wetlands recording observations of waterfowl use and tundra swan mortalities. In 2017, total waterfowl counts were the lowest ever observed since 2008. Spring conditions were icy and wet and peak waterfowl observations didn't occur until mid-March. During the peak, 58 percent of the waterfowl were counted at Schlepp East Field. However, within days of the peak observations, the river crested and most of the shallow feeding habitat was flooded causing most of the tundra swans to leave the Lower Basin. With low swan numbers and short duration of stay in the basin, only 5 swan mortalities were observed in 2017.

In December 2017, the Draft CDA Basin Long-term Biological Monitoring Report for 2012 – 2017 was submitted to EPA for review. Waterfowl survey field data and waterfowl and songbird blood; bullhead fish liver and benthic macroinvertebrate metals residue data collected as part of the remedial effectiveness and long-term monitoring were compiled for electronic transfer to EPA.

### **Sediment**

Sediment data WY 2017 (October 1, 2016 to September 30, 2017) are summarized below. In 2014 the threshold criteria for sampling of suspended sediment was raised from 20,000 cfs flow to 25,000 cfs at Cataldo. In the past during these events, EPA's contractors have collected high-volume isokinetic sediment samples at bridge locations. Since the bridges are relatively few and widely spaced, the data provide a "snapshot" of conditions but not the spatial and temporal variability of flow and sediment dynamics throughout the flood.

In mid-March 2017, intensive boat-based sampling of SSC, metals and nutrient concentrations was conducted during an overbank flood event with peak flows over 33,000 cfs. This sampling event is discussed further under the Lower Basin section.

Depositional sediment samples were collected at defined locations throughout the Lower Basin in WY 2017. As part of the long-term BEMP program, ten near-channel stakes locations and six off-channel tile locations were sampled as soon as practicable after floodwaters receded. In addition, 55 supplemental tile sampling stations (installed in 2013) were sampled to provide additional resolution regarding deposition rates and sediment characteristics in floodplain areas of interest.

The following conclusions provide a general summary of the depositional data collected for WY 2017:

- River flows in WY2017 were higher than average resulting in measurable sediment deposition at most locations, but lead concentrations measured at depositional stations were not similarly elevated; lead values were consistent with past water years.
- Lead concentrations in deposited sediment increase sharply downstream from Cataldo, indicating that lead is being mobilized from the CDA River channel below the grade break at the Cataldo dredge pool.
- Lead concentrations measured at BEMP depositional stations show a high degree of year-over-year variability, particularly at off-channel locations, complicating the assessment of long-term trends.

- Lead concentrations generally increase with decreasing particle size; the highest concentrations are typically found in the silt/clay fraction.
- The highest lead concentrations from supplemental sampling stations were measured near the Strobl splay area, near Killarney Lake, and near Swan Lake.

## **Part 2 – Other BEIPC Activities and Responsibilities:**

### **Lake Management Activities**

The Lake Management Plan (LMP), developed by the CDA Tribe and IDEQ, was finalized in 2009. Since then the CDA Tribe and IDEQ have been implementing core aspects of the LMP. LMP coordinators with IDEQ and the CDA Tribe have been conducting an ongoing audit of activities completed by various stakeholders since 2009. LMP implementation accomplishments in 2017 consisted of the following staff activities:

#### **Science Core Program**

- LMP staff updated the *2008-2014 Coeur d'Alene Lake Status Report* with 2015 data, and made it available to stakeholders at the December 2017 BEIPC meeting.
- LMP staff finalized publication of the *2008-2014 Coeur d'Alene Lake Status Report*, and made it available on their website as well directly sharing it with Basin Commissioners and staff.
- Routine core-lake monitoring by CDA Tribe and IDEQ staff continued through 2017.
- IDEQ completed visual rooted aquatic plant surveys within Blue Creek, Bennett, Neachen, Beauty, Kidd Island, and Wolf Lodge Bays. Milfoil was not observed in these locations. Annual reports of the plant surveys are forwarded to AVISTA. IDEQ is a cooperative partner under AVISTA's aquatic plant management program.
- The CDA Tribe continued its milfoil treatment program in southern waters during 2017, including continued herbicide, diver, and bottom barrier treatments. The CDA Tribe also conducted pre and post treatment monitoring to determine efficacy of treatments as well as conducted water quality sampling during the treatments.
- LMP staff partnered with University of Idaho to implement the first of a two-year study to monitor periphyton (attached algae) growth in northern bays to increase knowledge of bays productivity.

#### **Education & Outreach Core Program**

- Funds in Fiscal Year 2018 have been identified for the reprinting of revised Lake\*A\*Syst materials.
- LMP staff conducted water quality training for camp counselors at Camp Cross in Loffs Bay and Camp Four Echoes in Windy Bay.
- For the eighth consecutive year, LMP staff participated in a water quality educational booth at the North Idaho Fair in August, with partners from EPA and BEIPC. Survey information was collected from booth visitors in order to assess whether the audience reached at this event carried away the intended message. This information will be used for 2018 outreach planning. The Fair booth was awarded "Best Commercial Exhibit" for the second year.
- Throughout 2017, LMP staff provided updates on LMP activities to a variety of community groups and made various presentations to the public.



- LMP staff participated in several K-12 educational programs, including water science days at Ramsey and Hayden Meadows Elementary; Women in Science Fair at North Idaho College (NIC); the inaugural Coeur d'Alene Water Festival, which hosted over 300 fifth-graders from area schools; and other science-based programs.
- LMP worked with partners including Kootenai Environmental Alliance, University of Idaho Community Water Resource Center, and area high schools to successfully procure funds to continue the Confluence Project from the Women's Gift Alliance. The partners also hosted a Youth Water Summit at North Idaho College, involving over 200 north Idaho high school students in presenting water science-related research, judged by more than 40 agency and business representatives.
- LMP staff continued to be involved with the Panhandle Stormwater and Erosion Education Program (SEEP) and in partnership with the UI Community Water Resource Program (CWRC). LMP staff collaborated with UI to begin development of an outdoor classroom at the CWRC, featuring Low Impact Development (LID) technology. The CDA Tribe's engineer collaborated with the UI Water Quality Extension Educator and UI civil engineering students to develop and select draft designs. Construction is anticipated to begin in 2018.
- LMP staff participated in a continuing education training that provides relevant information related to water quality and land use regulation for realtors.
- LMP staff collaborated with the Spokane River Forum, CDA 2030 Project, the UI CWRC, the Coeur d'Alene Chamber of Commerce Natural Resource Committee (NR Committee) to conduct the third Our Gem Lake Symposium in November 2017. Approximately 200 attendees participated in the symposium, which featured updates from the LMP limnologists, as well as stakeholder presentations.
- LMP staff continued to work with the NR Committee to refine the "Local Gems" program. Local Gems is a program that was developed to recognize businesses and individuals that are doing things good for the health of Coeur d'Alene Lake. The NR Committee selects award recipients 2-4 times per year and announces the recipient at the Chamber's regularly-scheduled Upbeat Breakfast events.
- LMP staff partnered with Community Water Resource Center staff to initiate the Bay Watchers program, which aims to create an efficient communication framework between Coeur d'Alene lake area communities and agencies. Through regular meetings with individual community representatives, or "Bay Watchers," who act as liaisons between community members and agencies, information sharing is intended to be enhanced through open communication and idea-sharing.

#### **Nutrient Inventory & Nutrient Reduction Core Program**

- CDA Tribe and IDEQ staff continued to develop a GIS-based nutrient loading model. Staff have integrated available data into this model, and have shared preliminary presentations on their work at the BEIPC Technical Leadership Group and with the BEIPC. Calculations and estimates are undergoing further review and refinement, with spot checks using other models.
- LMP partners involved in the Coeur d'Alene Tributaries Watershed Advisory Group continue to focus on planning efforts in the Wolf Lodge drainage. The River Design Group conducted a watershed assessment to identify sediment sources, and provided a prioritized list of project sites and conceptual drawings to the WAG in 2017. LMP staff continued to provide technical assistance as requested.
- LMP staff worked with a landowner on lower Wolf Lodge Creek to install over 100 plants along roughly 1,300 feet of eroding streambank. This was the first phase of a multi-year effort to stabilize

streambanks, reduce sediment delivery to Wolf Lodge Creek and Coeur d'Alene Lake, and improve fish habitat. LMP staff continues to work with these landowners to install automated water quality monitoring station to collect nutrient samples. The intent is to capture more nutrient loading data and document baseline water quality information prior to upper watershed restoration activities (see previous bullet).

- LMP staff is working with AVISTA Corporation, Natural Resources Conservation Services (NRCS), the Benewah Soil and Water Conservation District, the Idaho Soil and Water Conservation Commission, and private landowners to implement stabilization of eroding banks along the St. Joe River. Planning, permitting, and coordination of multiple landowners occurred in 2017, and on-the-ground work is expected to occur in 2018. The project, once implemented, will stabilize 1,500 linear feet of riverbank.

### **Partnerships with Other Entities**

- LMP staff continued to be involved in the CDA River and Lake Tributaries Watershed Advisory Group (WAG), and the St. Joe/St. Maries Rivers WAG. These WAGs have completed 5-year reviews of existing Total Maximum Dairy Limits (TMDLs) of constituents for these water bodies.
- LMP staff worked with the BEIPC Executive Director to provide LMP activity updates to the TLG, CCC, and BEIPC during quarterly meetings and for written reports.
- LMP staff continued coordination with county staff and the CDA 2030 Project and have continued participation in the Coeur d'Alene Chamber's NR Committee. The LMP coordinator for the CDA Tribe continues to participate on the CDA 2030 Board and Implementation Committee. CDA 2030 provided marketing and logistical support to the 2017 Our Gem Symposium.
- LMP staff continued to collaborate with the UI EPSCoR "Managing Idaho Landscapes for Ecosystem Services (MILES)" project, which supports joint outreach activities and special studies.

This continued level of coordination with BEIPC forums maximizes opportunities for information exchange and advice, while recognizing that IDEQ and the CDA Tribe retain their respective decision-making authorities.



**Our Gem Lake Symposium**

## **Flood Control and Flood Infrastructure Revitalization**

In 2017 the BEIPC Executive Director (ED) worked with the local jurisdictions to complete the inventory of drainage and flood control facilities in the side drainages of the SFCDR. That inventory will be used to work with the CDA River Watershed Management Group to develop an Operation and Maintenance Plan for these facilities including assignment of O&M responsibilities to insure that they are properly maintained. It can also be used by the Restoration Partnership, working with local road jurisdictions to determine where culvert and bridge replacement projects could be coordinated to address fish passage and habitat improvement. The ED also worked with a consultant to evaluate the hydraulic loading design standard for the Remedy Protection Program to determine if that calculated loading would be equivalent to the 100 year FEMA flood calculations for mapping and flood insurance. The results of that evaluation were very positive and that information was shared with the local jurisdictions.

The BEIPC continued to assist Upper Basin communities and utilities in pursuing funding to implement the Upper Basin Drainage Control and Infrastructure Revitalization Plan (DCIRP). A large number of the priority drainage control projects and roads needs in the DCIRP have been and continue to be implemented as Remedy Protection and Paved Roadway Surface Remediation projects included in CERCLA/Superfund cleanup activities. A number of the local utility jurisdictions continued to replace potable water lines and sanitary sewers ahead of road and street actions under the Paved Roadway Program and the road program was coordinated with the utility work and remedy protection work to enhance the accomplishments being made with the funds available.

The local jurisdictions formed the Silver Valley Flood Protection Group to deal with flooding issues and to investigate opportunities to deal with flooding and its impacts on the communities and the Superfund remedies. The ED is continuing to work with this group for the common goal of flood protection. There is consideration being made to develop a formal partnership between the jurisdictions and the BEIPC to work together toward that goal.

## **Restoration Partnership**

The Restoration Partnership (Partnership) is made up of the Natural Resource Trustees which includes the USFS; DOI, including the BLM and USFWS; the CDA Tribe; and the State of Idaho, represented by the IDFG and IDEQ. The purpose of the Trustees' restoration projects is to restore natural resources injured by the release of hazardous substances as a result of historic mining and mining related activities in the Basin. The following work was accomplished in 2017, under the 2007 Interim Restoration Plan:

- **Schlepp Agriculture to Wetland Conversion Pilot Project**

The construction and implementation of the restoration project has been completed and ongoing operation and maintenance activities continued in 2017. Spring floods resulted in infrastructure damage, including a large outlet which drains the west field, through a culvert passing under the Trail of the Coeur d'Alene's. The infrastructure was repaired in late summer. The USFWS continued to work on the 10- year Operation and Maintenance Plan for the project with expected completion in early 2018.

- **Robinson Creek**

Wetland restoration work is complete however there will be ongoing noxious weed management and native vegetation plantings, which will be monitored with potential re-vegetation to account for natural planting. Water level management will support new plantings, including possible partial drawdowns to stimulate plant community growth and diversity.



In 2017, the Partnership finalized the draft Restoration Plan and draft Environmental Impact Statement, incorporating public comments as required by the National Environmental Policy Act (NEPA) process. The Notice of Availability of the Final Restoration Plan and Environmental Impact Statement is expected to be submitted to the Federal Register in early 2018.

The Partnership continued to coordinate with EPA in their remedial efforts, as identified in the RODA, and continued to coordinate with the BEIPC through the TLG and BEIPC quarterly meetings.

## *Challenges Ahead*

Although a great deal of work has been accomplished, continuing challenges and developing and implementing solutions to issues will be the focus of all the parties involved in environmental cleanup actions, CDA Lake Management, and Natural Resource Restoration in the Basin. As in the past years, the cleanup and restoration effort in 2017 was focused on a mix of items; remediation of human health risks resulting from contaminated residential and commercial properties and public roads; extensive work by the CDA Trust in the EFN Creek Drainage and work in the Canyon Creek drainage on ecological remedies; and EPA directed work to address the contaminated ground water problems and mine discharges noted in the Upper Basin RODA. Human health related projects continue to be a priority, but cleanup work in fish and wildlife habitat areas, surface and ground water, and inactive mine and mill sites is moving forward with EPA working with the BEIPC, IDEQ, the CDA Trust, other cooperating agencies and stakeholders. The Restoration Partnership also completed their Draft CDA Basin Restoration Plan and Environmental Impact Statement for implementation of natural resource restoration actions in the Basin.

Besides the RODA for the Upper Basin, the involved governments and agencies are continuing work on Lower Basin ecological issues and project planning. Because the CDA River system contains millions of tons of contaminated sediments, a portion of which is moving downstream every year, recontamination from annual flooding is a major concern for any project planned in the Lower Basin.

Other major challenges include: management of the ICP by PHD; development of any needed additional waste repositories for disposal of remedial action and ICP wastes; continued implementation of the RODA for the Upper Basin and OU-3 ROD for the Lower Basin; assistance to the local jurisdictions in their implementation of a storm water drainage control program; development of a solution to major flooding issues in Lower Pine Creek and the SFCDR; and continued coordination with the CDA Tribe and State's efforts to implement the Lake Management Plan and the Restoration Partnership to implement natural resource restoration actions.

The ASARCO bankruptcy settlement and the Hecla settlement continue to be the major sources of funding for the environmental remediation and natural resource restoration actions. Careful action through the implementation of the Upper Basin RODA and Lower Basin OU-3 ROD, any additional needed amendments plus diligent work on the part of the Restoration Partnership is necessary to ensure that the available funds are expended in a judicious manner. Current funding projections indicate that the funds from the Hecla settlement for remedial actions will be exhausted within the next few years. Some other source of funding will be needed to carry on remedial actions in the Box because funds from the ASARCO settlement cannot be used in the Box. Assuring sustainable funding intended to advance cleanup as planned in the RODs and amendments, along with operation and maintenance of the implemented remedies, restoration of injured natural resources, and management of CDA Lake represent a significant challenge into the future.