Coeur d'Alene Basin Cleanup

FRAMEWORK FOR A STRATEGIC PLAN
Goals and Objectives to Guide Cleanup of the Lower Basin

I. INTRODUCTION AND BACKGROUND

The Lower Basin, part of the Coeur d'Alene Basin Superfund Cleanup, is a complex system of river bed land bank, wetlands and upland with significant contamination due to historic mine waste disposal practices in the Upper Basin. It is part of the Bunker Hill Mining and Metallurgical Complex Superfund Site (Bunker Hill Site). The contamination in the Lower Basin is found throughout the riverbed and banks and in over 18,000 acres of wetlands and lateral lakes. People and wildlife use the resources of the Lower Basin in innumerable ways.

The Environmental Protection Agency (EPA) issued a Record of Decision (ROD) in 2002 that defines how cleanup will occur in both the Upper and Lower Basins. It sets forward Remedial Action Objectives (RAOs) against which all actions are measured[i]. The ROD is an interim decision document that recognizes implementation will occur over several decades. The extended time frame is necessary to refine understanding of how the complex Lower Basin system functions, to develop the sophisticated tools and plans necessary for effective remedial actions, to allow for the planning and implementation of technically challenging projects, and to adaptively manage cleanup as new data is collected and analyzed.

The ROD listed six remedial actions for implementation in the Lower Basin given information and analysis available in 2002 (Table 12.2-1 in the ROD). The ROD provides a large degree of flexibility in how EPA chooses to approach development and implementation of remedies in the Lower Basin. These six remedial actions identified are listed below:

- Conversion of agricultural and other lands to wetlands – up to 1,500 acres
- Remediation of prescribed wetlands to reduce sediment toxicity and waterfowl mortality – 1,169 acres
- Remediation of prescribed lakes to reduce sediment toxicity – 1,859 acres

- Bank stabilization to protect riparian zone ecological receptors and humans – 122 acres along 33.4 miles of river
- Construction and operation of 4 sediment traps at splay areas after implementing pilot study of one
- Periodic dredging of riverbed sediments from the Dudley Reach or other natural depositional areas – up to 2.6 million cubic yards over 20 plus years

It is expected that exposure by recreational and subsistence users of the Lower Basin will be reduced by implementing actions that are within the remedial options of the 2002 ROD. The ROD envisions a combination approach for the wetlands and lateral lakes to include excavation and consolidation, capping, and soil treatments to reduce lead bioavailability if effective treatment technologies can be identified through pilot testing. The ROD calls for cleaning up sediments in portions of the lateral lakes where the water depth is six feet or less. These water depths represent the highest use feeding areas and, consequently, the areas of greatest exposure to waterfowl and other animals. The ROD also recommends the use of hydraulic controls (floodgates) and levees to limit recontamination of treated areas.

An enhanced Conceptual Site Model (CSM) has been developed to inform current understanding of sediment transport. Pilot projects, such as the Schlepps agriculture to wetlands conversion project, have provided valuable lessons and success stories for protecting wildlife and creating functional wetland habitat. The Kahnderosa pilot project provided a demonstration of riverbank biostabilization to isolate contaminated riverbank soils and reduce erosion that could be implemented in other sites in the Lower Basin. Remedial actions in the Upper Basin are being designed and implemented to control particulate lead and the primary sources of dissolved metals to the South Fork of the Coeur d'Alene River; this will help to improve conditions in the Lower Basin as the cleanup progresses. In addition, some limited actions have been taken at selected Lower Basin locations to provide a barrier to exposure at informal boat ramps, parking areas and other recreational sites.

II. ABOUT THIS FRAMEWORK FOR A STRATEGIC PLAN

This document briefly describes the requirements, goals and objectives that are the framework for strategically planning cleanup of the Lower Basin. This document builds on information collected since the ROD was signed, lessons learned over the last 15 years of cleanup, and work already underway in the Lower Basin and the Upper Basin. The strategic planning process will guide how select remedial actions

already identified in the ROD will be prioritized, initiated, implemented and monitored by EPA through 2026, with the understanding that a full complement of remedial actions may take several decades to be complete. The ROD notes that large-scale cleanup of impacted sediments would be difficult and costly, presenting major technical and administrative challenges, as well as significant adverse short-term impacts. Pilot projects play a key role in informing, designing and implementing effective remedial actions. The strategic planning process will also assist in prioritizing pilot projects to support the selection and design of remedial actions.

The results of the strategic planning process will be integrated into the current Implementation Plan for the Bunker Hill Site[ii]. Ongoing strategic planning, coupled with monitoring data from implemented pilot projects and remedial actions, will provide information to select and refine future remedies.

As such, the strategic plan itself will be a living document periodically revisited in keeping with the adaptive nature of the cleanup process for the Bunker Hill site. Even as details of a strategic plan may change, the requirements, goals and objectives described in this framework document are expected to remain the same.

EPA will not select new remedies for the Lower Basin through the strategic planning process. However, as understanding of Lower Basin systems and effectiveness of remedial actions evolves, EPA may identify additional actions not explicitly called out in the ROD, but which would be effective. If this occurs, EPA will evaluate the need for an amendment to the ROD or an Explanation of Significant Differences (ESD).

Prior to implementation, the strategic plan will be shared with the public. Methods for engaging the community will be consistent with the site wide community involvement plan.

III. COMPONENTS OF THE STRATEGIC PLAN

As stated in the ROD, the purpose of cleanup is for all actions taken to: 1) provide protection to people from lead-contaminated soils and sediments and from contamination in aquatic food sources, and 2) provide protection to fish, waterfowl, migratory birds, and other plants and animals and contribute to a functioning ecosystem.

To achieve these purposes, EPA has established three components for a strategic planning process. They include two fundamental requirements, four goals for the cleanup itself, and two process objectives. These three components of the strategic planning process are described below.

Fundamental Requirements: The following are requirements necessary to implement the ROD.

1. Apply CERCLA mandates, policy and guidance to achieve appropriate and technically feasible remedies – EPA may only implement remedies selected as part of a decision document or conduct treatability studies to better inform remedial option selection and /or implementation. Selected remedies must comply with the nine criteria in Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA)[1], and with all applicable or relevant and appropriate requirements (ARARs) unless otherwise waived. Remedies selected in the 2002 ROD have undergone the nine criteria evaluation. In addition, the ROD specifically calls for pilot projects to help inform remedy selection and adaptive management.
2. Manage available financial resources and provide stewardship of funds – Action sequencing is highly dependent on the spending plan to utilize the Coeur d'Alene (CDA) Work Trust funds. Through the CDA Trust, EPA is also implementing prioritized cleanup actions in the Upper Basin to improve water quality and reduce the movement of contaminated sediments downstream, thereby minimizing the potential for recontamination from the Upper Basin to the Lower Basin. This requires sequencing and pacing of work in the Upper and Lower Basins to grow and sustain CDA Trust funds to ensure funding is available to meet the needs of the cleanup well into the future. It will be important to collaborate early and coordinate resources with the Coeur d'Alene Basin Natural Resource Trustees (Restoration Partnership) and partner agencies to maximize the effectiveness of each action and prioritize actions that most affect positive change.

Goals for Cleanup: Goals delineate exactly what is to be achieved through cleanup. Four goals are listed in the strategic plan. These directly relate to the RAOs defined in the ROD.

1. Reduce risks to people - Decrease exposure to people living and recreating along Lower Basin waterways through remediation, communication and education.

[1] https://semspub.epa.gov/work/HQ/174406.pdf

2. Control Sources of contamination - Reduce mobilization of particulate lead and other heavy metals, and reduce loading of particulate and dissolved metals to ecologically functional wetlands and off-channel areas and to Lake Coeur d'Alene.
3. Reduce risks to wildlife and aquatic resources - Maximize ecologically functional wetlands and off-channel habitat that is attractive and protective to waterfowl, migratory birds, song birds and small mammals. Improve surface water quality and reduce risks to aquatic organisms.
4. Promote long-term stewardship – Coordinate with other Lower Basin work and agencies including the Restoration Partnership, State of Idaho and Lake Management Plan parties to synchronize work and planning efforts to ensure limited resources are most effectively used. Promote long-term stewardship through adaptive management that optimizes the net value of the natural system and ensures protectiveness over time.

Process Objectives: Process objectives delineate how analytic tools, decision-making systems, partnerships and relationships will support and enhance the cleanup.

1. Coordinate with partners and community outreach – As part of EPA's ongoing work we will continue to engage with stakeholders and the broader community to ensure their input is considered during the cleanup process.
2. Utilize analysis tools and techniques – EPA will continue enhancing the CSM to better understand the sources and mechanics of sediment transport. In addition, other tools and computational models are being developed and will be used in conjunction with the Basin Environmental Monitoring Program to continually refine the CSM. Together, these will be used to enhance and understand the impact of the remedial work and guide future decisions.

The following pages describe the goals for cleanup and the process objectives for the strategic planning process. Actions and tactics to be employed by EPA will be identified as the strategic planning process proceeds.

IV. GOALS FOR CLEANUP

1. Reduce risks to people

Protecting human health by reducing risks to people continues to be the highest priority of the cleanup at the site. The Lower Basin presents unique challenges for addressing all the risks to people. The area is large and has many locations that are difficult to access. While the area does have full time residents, many of the recreational users are transient and utilize the area for a few days or weeks during the year. This area was a traditional subsistence hunting and gathering area for the Coeur d'Alene Tribe. These practices have stopped due to contamination. Further, the Coeur d'Alene River is a significant, ongoing source of contaminated sediment that regularly re-contaminates the shoreline and floodplain during high flow events.

Over the ten-year period of the Strategic Plan, EPA, in coordination with Idaho Department of Environmental Quality (IDEQ) and other stakeholders, will continue to implement several actions to reduce risks to people. A Recreational Strategy has been developed to address risks at recreational sites in the Upper and Lower Basin (http://www.deq.idaho.gov/media/60179045/cda-recreation-strategy-1016.pdf). Active education through signage, community outreach and engagement will continue to be an important part of EPA's strategy to ensure that locals and visitors to the area are aware of the risks and clean recreational practices. EPA will also look to implement remedial actions identified in the 2002 ROD and pilot projects in recreational areas to reduce risks. These projects may include ecologically friendly bank stabilization, beach remediation, capping and contaminant isolation. EPA will also look to complete cleanup of residential properties through the Basin Property Remediation Program (BPRP) in the Lower Basin.

2. Control Sources of Contamination

The largest source of contaminated sediment in the Lower Basin that is mobilized and transported downstream exists in the river bed. The objective of conducting source control actions is to reduce downstream and floodplain loading of contaminated sediments and associated risks to human health and the environment. Through ongoing data collection, evaluation and modeling, EPA will work to identify key source areas in the river bed while evaluating cleanup technologies that could be appropriate and cost effective for river bed source control. After evaluation and modeling, alternatives or technologies and specific locations will be prioritized so that the advantages and disadvantages of each are clearly understood prior to any implementation as pilot projects or future remedies. This work and selected source control pilot project(s) will be integral to inform the development of adaptive site management for the Lower Basin and help determine the need for a ROD Amendment or ESD.

EPA's implementation of remedies in the Upper Basin to control transport of particulate and dissolved-phased metal contaminants downstream to the Coeur d'Alene River including its floodplains and off-channel water bodies and Lake Coeur d'Alene will continue. Remedy effectiveness monitoring of the Upper and Lower Basin remedies will be conducted by EPA through the Basin Environmental Monitoring Program.

3. Reduce risks to wildlife and aquatic resources

The off-channel habitat of the Lower Coeur d'Alene River contains thousands of acres of wetlands and small lakes that provide for a diverse wildlife population and a valuable stopping place for migratory waterfowl. EPA's selected remedy for soil and sediment throughout the floodplains focused on protection of waterfowl and remediation of approximately 4,500 acres of wetland and lateral lakes out of 18,000 floodplain acres with lead levels above those observed to cause harmful effects to waterfowl (EPA, 2002). Migratory waterfowl monitoring has documented mortality in addition to decreased diversity, abundance, and habitat use. This information, combined with limited floodplain data and a hydraulic model of the Lower Coeur d'Alene River, has been used to further assess potential actions and areas of focus within the off-channel habitat. Cleanup activities will also consider water quality and risks to aquatic resources like fisheries, and will improve and protect these resources in off-channel habitats, small lakes and the Coeur d'Alene River.

Remedial actions within the Lower Basin that protect waterfowl and other wildlife present technical challenges. It is not technically feasible or cost effective to actively remediate all contaminated off-channel habitat without negative impacts to the wetlands and other functioning ecosystems. There is also the potential for periodic recontamination of near-channel and lowland areas during flood events because the Lower Basin remains, essentially, a wide floodplain system still processing large amounts of contaminated sediment. It is difficult to establish the degree of current use by the migratory bird population, which in turn affects the ability to measure success. However, remediation and conversion of agricultural lands to wetlands has been successfully piloted within the Lower Basin. Over time, waterfowl have increased presence on this functional and protective feeding habitat. Success in the Lower Basin will be measured, in part, by increased acreage of clean and functional feeding habitat.

During the next ten years, EPA will evaluate projects to determine if they are consistent with remedial goals for reducing exposure and controlling sources of contamination. EPA will coordinate with US Fish and Wildlife Services, land management agencies and the Restoration Partnership to reduce acute exposure to waterfowl and thereby reduce risk to other wildlife through a remediation strategy that dove-tails with restoration goals and objectives. This will be accomplished by using a holistic (top-down) and site-specific (bottom-up) approach to incrementally increase protective and usable feeding habitat and reduce attractive contaminated habitat. EPA will use empirical data and analytical tools (including specific guidelines and criteria) to identify focus areas and applicable remedies and tactics for increasing protective and functional acreage and shifting bird use. In parallel, EPA will work with private and public landowners to evaluate specific properties that may be candidates for pilot projects and apply lessons learned at Schlepps agriculture-to-wetland conversion project to optimize the cost-benefit of future remediation and restoration and to ensure long-term stewardship.

4. Promote long-term stewardship

EPA has the authority and responsibility for long-term protection of human health and the environment and will continue making progress to achieve these goals through implementation of the ROD. In addition, other federal, state, and Tribal authorities have responsibilities for protecting and conserving natural resources and addressing the injuries to natural resources from past mining practices. Public support and engagement are also crucial for long-term stewardship. With the size and complexity of the Lower Basin and limited financial resources to address all the issues, it is imperative that EPA, the Restoration

Partnership, and other state, federal, and local agencies work closely together on actions that will provide the greatest benefit towards achievement of shared goals. Through close coordination with the community and property owners, long-term planning decisions can be made to guide cleanup, restoration, and long term operations and maintenance activities to achieve these respective goals. This is particularly important in the Lower Basin with the ever-present risk of recontamination, mixed land ownership, and multiple uses of this important environment. To ensure the long-term protectiveness of remedies, EPA will coordinate with appropriate agencies and entities, which may include conservation easement holders, to ensure remedies are maintained and the land remains protective.

V. PROCESS OBJECTIVES

1. Coordinate with partners and community outreach

Designing a cleanup for the Lower Basin will be best achieved in coordination with our partners and the community. Our aim is to engage stakeholders early in our planning process, as well as throughout the cleanup. Early involvement will help ensure that our planning process integrates the interests and values of the many constituencies which have a stake in this geographic area. It will support our collective efforts to build and maintain constructive relationships, foster healthy partnerships, find mutual efficiencies, and understand community issues specific to this Site. EPA will provide clear information about the responsibilities and constraints under CERCLA, establish and communicate clear roles and responsibilities and work closely with partners with specific expertise, responsibility or sovereignty regarding aspects of the Lower Basin cleanup.

2. Utilization of analysis tools and techniques

There are several tools and analytical techniques that will be instrumental to successfully meeting EPA's cleanup goals in the Lower Basin. The effectiveness of source control and the durability of proposed remedies will be affected by the transport of contaminated sediment and potential for recontamination of soils and sediments in the floodplains. EPA has developed an enhanced CSM for the Lower Basin, which includes development of a 2D hydraulic model and sediment transport model. Ongoing work with the CSM has informed the lead-contaminated sediment budget in the Lower Basin and the relative potential for recontamination in the floodplain[iii] . The 2D hydraulic model and sediment transport model will be used to

evaluate current conditions and the potential for recontamination of the floodplain. It will also be used to inform, refine, and develop alternatives that reduce transport of contaminated sediment to off-channel lakes and wetlands and Coeur d'Alene Lake. EPA will also collaborate and share data with IDEQ and the Tribe to support their use of the Aquatic Ecosystem Modeling 3D (AEM3D) to understand the biogeochemical and physical processes influencing water quality, ecosystem dynamics, and metals cycling in Coeur d'Alene Lake.

Empirical data collection will continue to ensure that the models are reasonably representative of current conditions and can be used to evaluate cleanup alternatives. Several technical memoranda will be completed as new information is gathered that significantly increases our understanding of the system.

EPA has established and continues to refine an environmental monitoring program that has clear monitoring objectives and is consistent with site management decisions. EPA will continue to focus on both long-term environmental monitoring and site-specific remedy effectiveness monitoring to measure progress and performance. EPA will integrate findings of the Lake Management Plan monitoring and evaluation as it applies to site monitoring and management decisions.

The size and complexity of contaminated eco-habitat in the Lower Basin require that EPA's remediation strategies take a holistic view of the Basin and consider restoration and long-term management when selecting alternatives and focus areas. Because of the interconnectivity of remediation and restoration at this site – wildlife need both clean and usable feeding habitat - there is a need for a decision framework for prioritizing remedial activities that meets EPA cleanup goals, protects sensitive habitat and considers the restoration and land management objectives of numerous stakeholders.

The complexity and uncertainty regarding possible cleanup remedies in the Lower Basin is high. In response, EPA is using a framework of structured decision methods for selecting and implementing cleanup and monitoring actions. These methods include multi-objective decision analysis (MODA) for defining objectives and potential projects, and exploring the trade-offs represented by those actions. The framework will incorporate input from stakeholders, and will use adaptive management to refine options, methods and strategies through time, and will consider expected funding resources, which will evolve over time based on investment returns and site-wide management decisions.

VI. IMPLEMENTING THE STRATEGIC PLAN

Through 2018, EPA will meet with agency partners to review progress and gather key technical information to support the work. The MODA process will be used to identify projects, studies, and monitoring efforts for initial focus over a 3-year period and beyond.

On a periodic basis, EPA will summarize the status of ongoing projects, evaluate possible project refinements, consider new actions, and update the adaptive site management strategy. Activities are planned to include:

- Modeling results and changes
- Site-wide and project-specific monitoring results
- Property ownership changes or options
- Restoration activities
- Refinement of technology options based on pilot study results

This process will be developed with the input of key stakeholders, and include development of multiple scenarios that envision possible levels of funding for Lower Basin activities.

[i] Remedial Action Objectives, or RAOs , can be found in the ROD / RECORD OF DECISION Part 2, Decision Summary Bunker Hill Mining and Metallurgical Complex OU 3 Section 8.0 September 2002 Page 8-1 (https://goo.gl/sAO87P)

[ii] The Bunker Hill Superfund Implementation Plan can be found under Documents and Reports at the Bunker Hill Superfund website: https://cumulis.epa.gov/supercpad/cursites/csitinfo.cfm?id=1000195

[iii] Information on the Lower Basin enhanced CSM may be found under Documents and Reports for the Lower Basin at the Bunker Hill Superfund website: https://cumulis.epa.gov/supercpad/cursites/csitinfo.cfm?id=1000195