

4.0 REMEDIAL ACTION OBJECTIVES (RAOs), PRELIMINARY REMEDIATION GOALS (PRGs), AND POTENTIAL APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS (ARARs)

This section identifies the objectives of the remedial actions in the Coeur d'Alene Basin. RAOs provide a general description of what a CERCLA cleanup would be designed to accomplish (USEPA 1997). RAOs developed for protection of human health in the Coeur d'Alene Basin are identified in Table 4.1-1. RAOs developed for protection of ecological receptors are identified in Table 4.1-2.

Determination of the feasibility of remedial actions requires the identification of PRGs. PRGs are criteria by which aspects of a cleanup under CERCLA are measured. They include potential statutory and regulatory requirements (ARARs), guidance and advisories (to be considered materials, or TBCs), and risk-based concentrations of chemicals in environmental media that have been brought forward from the human health and ecological risk assessments conducted for the site. Candidate PRGs have been developed and are presented in Section 2 of the FS Part 2 and Section 2 of the FS Part 3.

ARARs are the standards derived from environmental laws and regulations that must be met by the remedial actions in the Coeur d'Alene Basin (unless the conditions for a waiver of ARARs are met). ARARs are considered potential or preliminary until finalized by EPA in the ROD. ARARs derive from laws and regulations at the federal, State of Idaho, State of Washington, Coeur d'Alene Tribe, and Spokane Tribe levels. Potential ARARs are identified in Section 2 of the FS Part 2 and Section 2 of the FS Part 3.

**Table 4.1-1
 Remedial Action Objectives for Protection of
 Human Health in the Coeur d'Alene Basin**

Environmental Media	Preliminary Remedial Action Objectives
Soils, Sediments and Source Materials	<p>Prevent mechanical transportation of soil and sediments containing unacceptable levels of contaminants into residential areas and structures.</p> <p>Reduce or eliminate lead exposure pathways such that the probability of an individual child (aged 0 to 84 months) exceeding a blood lead level of 10 µg/dL is 5% or less and of exceeding a blood lead level of 15 µg/dL is 1% or less. The exposure unit of a young child is centered in and around their individual residence as well as other areas in the community where routine exposures are occurring.</p> <p>Prevent direct human exposure to soils and sediments (ingestion, inhalation, and dermal contact) that:</p> <ul style="list-style-type: none"> • Would produce excess cancer risks greater than 1×10^{-6} OR • Have concentrations of COPCs greater than selected PRGs for soil.
Groundwater and Surface Water as Drinking Water	Prevent ingestion by humans of groundwater or surface water withdrawn or diverted from a private, unregulated source and used as drinking water and which contains COPCs for drinking water exceeding selected PRGs for drinking water.
House Dust	Prevent the introduction of lead to residences from areas outside the home via tracking and air pathways such that the probability of an individual child (aged 0 to 84 months) exceeding a blood lead level of 10 µg/dL is 5% or less and of exceeding a blood lead level of 15 µg/dL is 1% or less.
Aquatic Food Sources	Prevent ingestion by humans of aquatic organisms from surface waters containing contaminants of concern exceeding risk-based threshold concentrations
Vegetable Consumption	<p>Prevent ingestion by humans of homegrown vegetables containing contaminants of concern exceeding risk-based threshold concentrations.</p> <p>Prevent use of residential garden soil that has concentrations of COPCs greater than rural northern Idaho background levels.</p>

^aDevelopment of these objectives are based on directives by EPA OSWER (U.S. Environmental Protection Agency, 1994; U.S. Environmental Protection Agency, 1998), as presented in Appendix D of the FS Part 2.

Notes:

- COPC - chemical of potential concern
- NAAQS - National Ambient Air Quality Standards
- OSWER - Office of Solid Waste and Emergency Response
- PRG - preliminary remediation goal
- TSP - total suspended particulates
- µg/dL - micrograms per deciliter

**Table 4.1-2
 Remedial Action Objectives and General Response Actions for
 Protection of Ecological Receptors in the Coeur d'Alene Basin**

Subject	Remedial Action Objective	General Response Action
Ecosystem	Maintain (or provide) soil, sediment, and water quality capable of supporting a functional ecosystem for the aquatic and terrestrial plant and animal populations in the Coeur d'Alene Basin	Containment Treatment Removal Disposal
Ecosystem	Maintain (or provide) soil, sediment, and water quality supportive of individuals of special-status biota that are protected under the Endangered Species Act and the Migratory Bird Treaty Act	Containment Treatment Removal Disposal
Soil/Source Materials	<p>Prevent ingestion or uptake of arsenic, cadmium, copper, lead, mercury, and zinc by ecological receptors at concentrations that could be harmful to them or to animals that consume them.</p> <p>Reduce loadings of metals from soil/source materials to surface water so that loadings do not cause exceedances of surface water PRGs</p> <p>Prevent transport of metals from soil/source materials to groundwater at concentrations that exceed surface water PRGs</p> <p>Prevent root uptake of arsenic, cadmium, copper, lead, mercury, and zinc by plants at concentrations that exceed soil PRGs</p> <p>Prevent dermal contact with arsenic, cadmium, copper, lead, mercury, and zinc by invertebrates at concentrations that exceed soil PRGs</p>	Containment Treatment Removal Disposal
Sediment	<p>Prevent ingestion or uptake of arsenic, cadmium, copper, lead, mercury, and zinc by birds, mammals, aquatic invertebrates and fish, aquatic plants, and amphibians at concentrations that exceed sediment PRGs</p> <p>Prevent dermal contact with arsenic, cadmium, copper, mercury, and zinc by aquatic invertebrates and fish, aquatic plants, and amphibians at concentrations that exceed sediment PRGs</p>	Containment Treatment Removal Disposal
Mine Water Seeps, Springs, and Leachate	Prevent discharge of seeps, springs, and leachate to surface water at concentrations that exceed surface water PRGs	Treatment

Table 4.1-2 (Continued)
Remedial Action Objectives and General Response Actions for
Protection of Ecological Receptors in the Coeur d'Alene Basin

Subject	Remedial Action Objective	General Response Action
Surface Water	<p>Prevent ingestion or uptake of arsenic, copper, lead, mercury, and zinc by ecological receptors at concentrations that exceed surface water PRGs</p> <p>Prevent ingestion of surface water at a cadmium concentration (above PRG) that may cause adverse impacts to bull trout</p> <p>Prevent dermal contact with or uptake of arsenic, cadmium, copper, lead, mercury, and zinc by birds, mammals, aquatic invertebrates and fish, aquatic plants, and amphibians at concentrations that exceed ambient water quality criteria or state or tribal water quality standards</p>	<p>Source Control Containment Treatment Removal Disposal</p>
Groundwater	<p>Prevent discharge of groundwater to surface water at concentrations of arsenic, copper, lead, mercury, and zinc that exceed surface water PRGs</p> <p>Prevent discharge of groundwater to surface water at a cadmium concentration that may cause adverse impacts to bull trout</p>	<p>Source Control Hydraulic Isolation Disposal</p>