Clark Fork River Operable Unit (OU #3)
Milltown Reservoir/Clark Fork River Superfund Site
CERCLIS Identification Number: MTD980717565

Explanation of Significant Differences

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1.0 INTRODUCTION AND STATEMENT OF PURPOSE

This document presents an Explanation of Significant Differences (ESD) for the Record of Decision (ROD) for the Clark Fork River Operable Unit (CFR OU) of the Milltown Reservoir/Clark Fork River Superfund Site. The CFR OU ROD was issued in April 2004 by the U.S. Environmental Protection Agency (EPA), pursuant to the Comprehensive Environmental Response, Compensation, and Liability Act as amended (CERCLA). The Montana Department of Environmental Quality (DEQ) concurred with the ROD. A consent decree, entitled the Consent Decree for the Clark Fork River Operable Unit and for Remaining State of Montana Clark Fork Basin Natural Resource Damage Claims, and the Clark Fork Site Site-Specific Memorandum of Agreement (SMOA) designates DEQ as the Lead Agency for Remedial Design and Remedial Action (RD/RA). EPA is the support agency.

The primary sources of contamination within the CFR OU are tailings and tailings mixed with soil in streambanks and the historic floodplain. For the floodplain tailings and soils component, the ROD separated the tailings and tailings mixed with soils into three separate categories based on vegetation density and severity of contamination. The ROD states that the Clark Fork River Riparian Evaluation System (CFR RipES, or RipES), a vegetative survey developed for the CFR OU, would be used as a tool to make classifications and determine actions consistent with the standards set forth in the ROD. A review of post-ROD sampling of the CFR OU and the results of EPA's 2007 RipES mapping for the floodplain tailings and soils component of the remedy led to this ESD. It was concluded that site factors should be considered during Remedial Design to assure implementation of the Record of Decision requirements, as contemplated by the ROD. These site factors are identified in this ESD.

The modification identified in this ESD results in a significant change in the scope of the CFR OU remedy, but does not fundamentally alter the remedy with respect to scope, performance, or cost. Section 117(c) of CERCLA requires the state or federal government to publish an ESD including the reasons the changes were made. Section 300.435(c)(2)(i) of the National Contingency Plan (NCP) requires the lead agency to make the ESD and supporting information available to the public, and publish a notice in a major local newspaper of general circulation that briefly summarizes the ESD, including the reasons for such differences.

The Explanation of Significant Differences will become part of the CFR OU Administrative Record. The Administrative Record is located at EPA's Montana Records Center, 10 West 15th Street, Suite 3200, Helena, Montana 59626, and at on-site locations, and is available Monday through Friday, 8:00 a.m. - 4:30 p.m. The Records Center's phone number is (406) 457-5046.

2.0 SITE HISTORY, CONTAMINATION, AND SELECTED REMEDY

The Clark Fork River Operable Unit is comprised of approximately 120 river miles of the Clark Fork River. The CFR OU extends from the confluence of the old Silver Bow Creek channel with the reconstructed lower Mill -Willow bypass, near Anaconda, to the maximum former Milltown Reservoir pool elevation east of Missoula. Approximate boundaries are shown in Exhibit 1. The majority of the ROD cleanup will occur from the beginning of the CFR OU downstream to Garrison. This section is referred to in the ROD as Reach A.

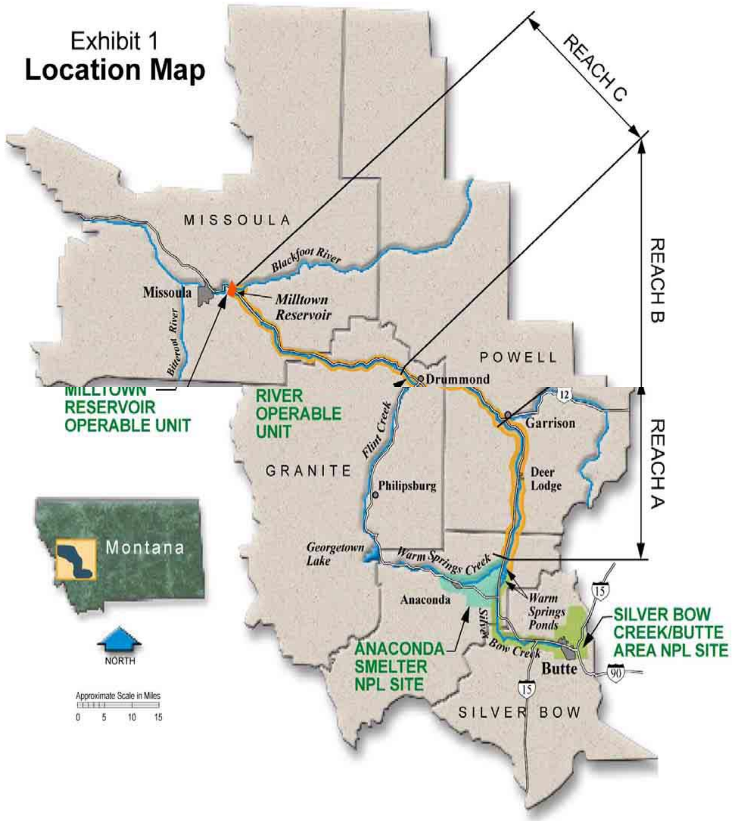

Exhibit 1: Location Map

The CFR OU consists of surface water, streambed sediments, tailings, impacted soils, groundwater, aquatic resources, terrestrial resources, irrigation ditches, and related sediment deposition and contaminated property, and air, located within and adjacent to the 100-year historic floodplain of the Clark Fork River.

2.1 Contamination

Contaminants present in the CFR OU are from historic mining and smelting processes upstream of the Clark Fork River. In the Butte area, mining companies routinely disposed of mining and milling wastes directly into Silver Bow Creek. The mining wastes were carried away and mixed with river bed sediments by the various higher seasonal flow events in Silver Bow Creek, and much was subsequently carried into the upper Clark Fork River. In the Anaconda area, large quantities of wastes from the Anaconda Company's operations also reached the Clark Fork River through Warm Springs Creek and other tributaries. In early 1908, the largest flood event on record for the Clark Fork River drainage occurred. This resulted in flooding down the entire Clark Fork River drainage. During this event, extensive quantities of waste, contaminated soils, and contaminated sediments were deposited within the Clark Fork River floodplain.

The contaminants of concern (COCs) for the site are arsenic, cadmium, copper, lead, and zinc. Copper is considered the primary contaminant associated with environmental risk, and arsenic is considered the primary contaminant associated with human risks.

The primary sources of contamination are tailings and tailings mixed with soil in streambanks and the historic floodplain. These sources provide pathways to plant and animal life, and to humans who come in contact with the soils. Contaminants move from tailings and impacted soils through the process of erosion, directly into the river and other surface waters. This movement provides pathways to terrestrial and aquatic life. In addition to erosion of tailings and impacted soils, metals and arsenic can be leached directly from the tailings and contaminated soils into groundwater and surface water. The ROD estimates the total volume of tailings in Reach A to be 7.6 million cubic yards, and the total volume of tailings in Reach B to be 1.6 million cubic yards.

2.2 Site History

EPA placed the original Silver Bow Creek Superfund Site on the NPL in 1983. The Silver Bow Creek Superfund Site was later extended to include the Clark Fork River to the Milltown Reservoir, through administrative action taken by EPA. EPA also designated a separate site for the NPL, immediately downstream of the Silver Bow Creek Superfund Site known as the Milltown Reservoir Superfund Site. In February 1990, the Clark Fork River portion of the Silver Bow Creek / Butte Area Superfund Site was administratively transferred to the Milltown Reservoir Superfund Site. After the transfer, the entire site became known as the Milltown Reservoir / Clark Fork River Superfund Site.

The Potentially Responsible Party for the Clark Fork River Operable Unit of the Milltown Reservoir/Clark Fork River Superfund Site, ARCO, now known as the Atlantic Richfield Company, prepared the major portions of the CFR OU Remedial Investigation (RI), begun in 1995, and Feasibility Study (FS), began in 2000, pursuant to EPA order. EPA released the Proposed Plan for the CFR OU in August 2002, and the CFR OU Record of Decision was issued in April 2004. The Clark Fork River consent decree was entered in August 2008.

The Clark Fork River Human Health Risk Assessment evaluated the likely scenarios for human exposure to contaminants of potential concern for the CFR OU. Arsenic in soils and tailings is the primary concern for human exposures at this site. The ROD's cleanup level for arsenic in soils are residential – 150 ppm; rancher/farmer – 620 ppm; and recreational – 680 ppm for children at Arrowstone Park and other similar recreational scenarios or 1,600 ppm for fishermen, swimmers, and tubers along the river. An exposure area (e.g., residential yard, horse pasture) with an average concentration of arsenic in soils that exceeds the cleanup level for a particular land use, as described above, requires cleanup.

Based on ecological studies conducted within the CFR OU, especially the Ecological Risk Assessment, the ROD determined that widespread unacceptable terrestrial and aquatic risks exist in Reach A and portions of Reach B. Areas of primary concern are phytotoxic soils, and subsequent lack of or reduced vegetation, impacts on livestock and wildlife, and unacceptable acute and chronic risks to aquatic receptors, principally fish and benthic macroinvertebrates.

2.3 Exposure Pathways

The exposure pathways consist of:

- Surface water: Surface water runoff from tailings and contaminated soils into the river transports both dissolved and particulate-bound metals and arsenic to aquatic life and creates surface water contamination. Erosion of banks also provides contaminants to surface water and aquatic life.

- Groundwater: Movement of groundwater through tailings and contaminated soil causes groundwater to become contaminated.

- Streambed sediments: Stream sediments receive surface water contaminants and contain metal contamination.

- Historically irrigated fields: Irrigation ditches and fields historically irrigated with Clark Fork River water have been contaminated by surface water contaminants. Arsenic from this deposition may create unacceptable human health risks for residences near or on such fields. Sediments in irrigation channels may also present risks to certain workers, particularly at the Grant-Kohrs Ranch National Historic Site.

- Biological resources: Contaminant uptake in plants is a well-documented occurrence that prevents or limits the establishment of vegetation on the land. Aquatic plants and animals receive the contaminants through direct consumption of contaminated sediment, contaminated food sources, or through absorption in water. Wildlife may receive contamination through soil, plant, water, and animal ingestion.

2.4 Selected Remedy

As discussed in Section 2.0, the majority of the ROD cleanup will occur from the beginning of the CFR OU downstream to Garrison, referred to as Reach A, as well as limited areas within Reach B. No action is selected for Reach C. For Reach A and limited areas within Reach B:

- Exposed tailings, also referred to as slickens or severely impacted soils and vegetation,[1] are to be removed, and the excavated area revegetated, with a limited exception. The limited exception is for severely impacted areas that are 400 square feet or less, less than approximately two feet in depth, and contiguous with impacted areas. When this exception is present, in-situ treatment will be done.

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[1] The terms "exposed tailings," "slickens," and "severely impacted" are all used in the ROD. This ESD utilizes the term "severely impacted areas." The terms "impacted soils and vegetation areas" and "impacted areas" are also used interchangeably in the ROD. This ESD utilizes the term "impacted areas." Similarly, this ESD utilizes the term "slightly impacted areas" for the ROD terms "slightly impacted soils and vegetation areas" and "slightly impacted areas." Therefore, the three categories identified in the ESD are: (1) severely impacted areas, (2) impacted areas, and (3) slightly impacted areas.

- In most instances, impacted soils and vegetation, also referred to as impacted areas, will be treated in place, using careful lime addition and other amendment as appropriate, soil mixing, and re-vegetation.

- Some impacted areas will be removed, where depth of contamination prevents adequate and effective treatment in place, where saturated conditions make in-situ treatment unimplementable, or where post treatment arsenic levels, after one re-treatment attempt, remain above the human health cleanup level for the current or reasonably anticipated land use.

- The RipES process will be used in remedial design to identify severely impacted areas and impacted areas, and areas where the exceptions to removal or in-situ treatment will apply.

- Streambanks will be stabilized primarily by "soft" engineering (with limited hard engineering where conditions warrant) for those areas classified and an approximate, flexible 50-foot riparian buffer zone will be established on both sides of the river.

- Opportunity Ponds will be used for disposal of all removed contamination.

- Weed control for in-situ treatment, streambank stabilization, and removal areas is required.

- Best Management Practices (BMPs) throughout Reach A and in limited areas of Reach B are required to protect the remedy and ensure land use practices are compatible with the long-term protection of the Selected Remedy.

- Institutional Controls (ICs) and additional sampling, maintenance, and possible removal or in-situ treatment of contamination, including the Trestle Area, will be required to protect human health.

- Monitoring during construction, construction BMPs, and post-construction environmental monitoring are required.

- The remedy is also modified and expanded for the Grant-Kohrs Ranch National Historic Site, located in Reach A.

2.5 Performance Standards and Remedial Goals

The ROD includes performance standards and remedial goals for the CFR OU.

The Remedial Action Objectives (RAOs) for floodplain tailings and impacted soils are:

- Prevent or inhibit ingestion of arsenic-contaminated soils/tailings where ingestion or contact would pose an unacceptable health risk.

- Prevent or reduce unacceptable risk to ecological (including agricultural, aquatic, and terrestrial) systems degraded by contaminated soils/tailings.

The ROD elaborates on the floodplain tailings and impacted soils RAOs:

> Successful reclamation of land contaminated by mining activities within the Clark Fork River OU is defined as establishing plant communities capable of stabilizing soils against wind and water erosion, reducing transport of COCs to groundwater and surface water, and compliance with ARARs or replacement standards, in perpetuity. Goals of the plant community are to establish a permanent vegetative cover to accomplish the following:

- Minimize direct contact with arsenic, thus reducing the potential risk of human exposure to acceptable risk-based levels.
- Provide geomorphic stability to streambanks, thus minimizing release of COCs to the river.
- Improve agricultural production by reducing or eliminating phytotoxic conditions, thus providing for multiple land uses.
- Minimize surface water erosion and COC transport to surface water through methods described in the Selected Remedy.
- Minimize transport of COCs to groundwater.
- Minimize wind erosion and movement of contaminated soils onto adjacent lands, thus eliminating human, agricultural, and wildlife exposure.
- Remediate contaminated soils to be compatible with the existing and anticipated future land use with minimal future maintenance activities.

The groundwater RAOs are:

- Return contaminated shallow groundwater to its beneficial use within a reasonable time frame.
- Comply with State groundwater standards, including nondegradation standards.
- Prevent groundwater discharge containing arsenic and metals that would degrade surface waters.

The groundwater standards include arsenic (10 ug/l), cadmium (5 ug/l), copper (1,300 ug/l), iron (300 ug/l), lead (15 ug/l), and zinc (2,000 ug/l).

The surface water RAOs require compliance with surface water standards. Montana DEQ-7 copper total recoverable standards have been waived in the ROD to federal ambient water quality criteria for copper, due to technical impracticability. The surface water standards include arsenic (340 ug/l – acute, 150 ug/l – chronic, 10 ug/l – human health), cadmium (2.1 ug/l @ 100 mg/l hardness – acute, 0.27 ug/l@ 100 mg/l hardness - chronic), copper (13 ug/l – acute, 9 ug/l – chronic, 1300 ug/l – human health), lead (81 ug/l @ 100 mg/l hardness - acute, 3.2 ug/l @ 100 mg/l hardness - chronic, 15 ug/l – human health), and zinc (119 ug/l @ 100 mg/l hardness - acute, 119 ug/l @ 100 mg/l hardness - chronic, 2,000 ug/l – human health).

2.6 Remedial Design / Remedial Action

The ROD was issued in 2004. In 2006 – 2007, while consent decree discussions were in progress, EPA performed RipES mapping for the floodplain tailings and soils component. DEQ began its Remedial Design activities in 2008, following entry of the consent decree, which designated DEQ as Lead Agency. DEQ focused its first remedial actions on immediate human health concerns. DEQ, in consultation with EPA, and in accordance with consent decree requirements, performed residential yard removals,[2] necessitated by elevated levels of arsenic and lead, in fall 2010 through summer 2011. DEQ, in consultation with EPA and in accordance with consent decree requirements, performed the Trestle Area Cleanup in fall and winter 2011 - 2012, with planting in spring 2012. The trestle cleanup involved removal of residential soils with elevated levels of arsenic, and reconstruction and revegetation of 1,000 feet of streambank. In fall and winter 2012, DEQ performed the remedial action for the pasture areas that were historically irrigated with Clark Fork River water. DEQ commenced Remedial Action on the floodplain tailings and soils component in March 2013.

3.0 BASIS FOR ESD

RipES is primarily a vegetation survey, developed during the RI/FS, with later iterations by EPA. The ROD provides for the RipES process to be used as a significant tool in developing Remedial Design. However, sampling and field observations relating to vegetation health and other factors, has shown that use of RipES determination alone would not lead to implementation of the Record of Decision requirements or fully meeting RAOs.

3.1 RipES Determination of Severity of Floodplain Soils Contamination

The ROD, Section 13.6.1.1, entitled CFR RipES, states:

> CFR RipES is a tool that allows the Record of Decision requirements to be implemented on a site-specific, refined, and definitive basis. The purpose of CFR RipES is to provide a data predicated decision tool to identify and categorize polygons (delineated areas of land) based on landscape stability and plant community attributes within the Clark Fork River OU. CFR RipES will be used to make classifications and determine actions consistent with the standards set forth in the Record of Decision.

RipES concluded that high levels of contamination in floodplain soils would be identified as a result of the RipES vegetation evaluation. RipES identified and categorized “types of soils polygons” that served to “distinguish the severity of contamination of the floodplain soils.” RipES used a self-described “ocular” approach to determine whether a specific soils polygon fell

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[2] Though outside of the Clark Fork River floodplain, the residential yard removals are required as part of the remedy due to the use of Clark Fork River surface water for irrigation in this area. The ROD requires “continued removal of arsenic contamination in the East Side Road area as needed and further evaluation of irrigated land for human health reasons.”

into the category of (1) severely impacted areas, (2) impacted areas, or (3) slightly impacted areas. The ROD then provides for remedial action for each of the three categories of RipES soils polygons. As described above, severely impacted areas in most instances require removal of contamination. Impacted areas would generally be treated in situ. Slightly impacted areas had either no action, or BMPs and ICs.[1]

3.2 Data from Application of the RipES Tool

Data obtained from sampling at the CFR site indicated that RipES, when applied by EPA in 2006 – 2007, did not fully or accurately distinguish the severity of contamination between severely impacted areas, and impacted areas and slightly impacted areas, nor between impacted areas and slightly impacted areas. This demonstrated that the RipES process as designed is not effective in differentiating tailings and contaminated soils among soil polygons, with severely impacted areas identifying the most highly contaminated, impacted areas identifying highly contaminated, and slightly impacted areas identifying primarily nonactionable contamination.

In addition, data from the State's subsequent contaminant sampling of the CFR OU demonstrates that many of the soil polygons identified as being slightly impacted in the 2006-2007 RipES application were contaminated at much higher levels, with similar levels of contamination to areas identified as severely impacted and impacted in 2006-2007. The RipES process as designed does not reliably "distinguish the severity of contamination of the floodplain soils," or fully classify areas within Reach A and limited areas of Reach B among the three categories, as set forth in the ROD.

4.0 DESCRIPTION OF SIGNIFICANT DIFFERENCE

4.1 Remedial Design Considerations

DEQ has developed Remedial Design considerations, set forth below, which through RD/RA, allow implementation of Record of Decision requirements, including Performance Standards and Remedial Goals. Each Remedial Design consideration (except Groundwater 4.1.1) matches the ROD's structural requirement for RD/RA. That structural requirement is that "areas within the Upper Clark Fork River floodplain [be] classified for purposes of determining specific remedial actions based on landscape stability, contamination, and plant community dysfunction." (ROD, p. 2-93).

4.1.1 Groundwater

The ROD found that the arsenic human health standard of 10 ug/l was exceeded at 5% of all domestic wells within the CFR OU. Exceedances of arsenic were found in 11% of all CFR OU domestic and non-domestic use wells during the RI/FS, prior to the lowering of the arsenic standard from 18 ug/l to 10 ug/l. The ROD found 5% of groundwater samples exceeded standards for cadmium, lead, and zinc.

[1] The ROD's miscellaneous site types fall outside the soils and vegetation areas categorizations.

Remedial Design therefore requires an analysis of the presence or absence of saturated substrate where contamination is present, in order to address groundwater RAOs to return contaminated shallow groundwater to its beneficial use within a reasonable time frame, comply with State groundwater standards, including nondegradation standards, and prevent groundwater discharge containing arsenic and metals that would degrade surface waters. This analysis will be considered in Remedial Design.

4.1.2 Riparian Vegetation

The ROD considers the establishment of appropriate woody and herbaceous vegetation key to the success of the Selected Remedy. The ROD states that "successful reclamation of land contaminated by mining activities within the Clark Fork River OU is defined as the establishment of plant communities capable of stabilizing contaminated soils against wind and water erosion, reducing COCs transport to groundwater, reducing the risk to human health and the environment, and compliance with Performance Standards, in perpetuity." (ROD, p. 2-113). Remedial Design has found an overall decay trajectory in vegetation, with little sign of regeneration.

Under RipES, all vegetation other than tufted hair grass was considered appropriate riparian vegetation, including other metals-tolerant species, noxious weeds, and invasive species. Remedial Design, in order to meet the remedial requirements, including vegetation performance standards (such as a viable self-sustaining plant community), instead focuses on riparian plant community diversity in species, health, and age. Remedial Design requires an analysis of existing and prospective native hydrophytic vegetation, where contamination is present, in its determination of self-sustaining riparian vegetation. This analysis will be considered in Remedial Design.

4.1.3 Geomorphic Stability

For surface water, the ROD found that COC concentrations are higher in the Clark Fork River than in the reference streams, and are often above State and federal water quality standards and criteria, especially for copper and arsenic. The ROD found that concentrations of metals and arsenic in river water are higher in Reach A and decrease in downstream reaches, primarily because of dilution by tributary streams. The ROD found that COCs are supplied to the river as streambank tailings, and contaminated sediments are eroded into the river. Also, water quality may change dramatically in response to storm events and overbank flows.

The ROD states that, "geomorphic stability is characterized by a dynamically stable floodplain that allows for lateral adjustment through normal streambank erosion and bar building." (ROD, p. 3-15). Remedial Design requires a geomorphic analysis to establish the present and needed hydraulic conditions of the Clark Fork River to maintain geomorphic stability, where contamination is present. This analysis will be considered in Remedial Design. Achieving geomorphic stability will likely have the effect of lowering the floodplain, which has the added benefit of providing the necessary floodplain function for ROD required self-sustaining riparian vegetation.

4.1.4 Contaminant Sampling

Included in RAOs related to floodplain tailings and impacted soils are the prevention or inhibition of ingestion of arsenic-contaminated soils/tailings where ingestion or contact would pose an unacceptable health risk, and prevention or reduction of unacceptable risk to ecological (including agricultural, aquatic, and terrestrial) systems degraded by contaminated soils/tailings. All other RAOs also relate to contamination as a direct or indirect source, as would be expected.

Any sampling under RipES considered average pH and average copper and arsenic concentrations, and primarily relied on an ocular approach to determine depth of contamination. Remedial Design sampling expands sampling to include all ROD COCs, involving lab analysis and X-ray fluorescence (XRF) screening. Results will be compared to human health levels, and those which represent a significant loading source. High levels of arsenic found in CFR OU's floodplain setting will also be factored into Remedial Design in order to avoid increasing mobility of arsenic under higher pH conditions.

Remedial Design includes other ROD considerations, such as ownership, infrastructure, land use, and site-specific remedy requirements. These will be considered in the Remedial Design site-specific design plans.

4.1.5 Ownership

The ROD states that within Reach A, almost 300 landowners live along the Clark Fork River, with fourteen major landowners owning more than 70% of Reach A. DEQ will work with landowners as set forth in the ROD during RD/RA.

4.1.6 Infrastructure

The ROD notes that the CFR OU includes highways, railroads, pipelines, and various other infrastructure, which will need to be considered in RD/RA.

4.1.7 Land use

As stated in the ROD, differing land uses exist within the CFR OU. For example, the ROD notes that livestock grazing and hay production are common land uses within the OU. Remedial Design will consider current and reasonably anticipated land uses, as set forth in the ROD.

4.1.8 Site-Specific Remedy Requirements

Some areas may be affected by compliance with site-specific remedy requirements. For example, the ROD notes that remediation of Grant-Kohrs Ranch National Historic Site must meet additional requirements set forth in the ROD.

4.2 Conclusion

All of the above factors will be analyzed in the manner described above, to make final Remedial Design determinations for severely impacted areas, impacted areas, and slightly impacted areas. ROD requirements for each of these classifications will then be applied as final design documents are prepared.

The weight or specific manner in which the Remedial Design considerations will be applied in Remedial Design will vary depending on site-specific conditions ascertained as part of Remedial Design. Severely impacted areas will tend to have dominant factors, for example, extensive contamination within the channel migration zone, a significant loading source to groundwater, or human health exceedances necessitating removal. Slightly impacted areas will represent the other end of the spectrum, such as areas with no human health exceedances, and little to no contamination. Impacted areas will generally be areas without a dominating factor, but still necessitating treatment in order to meet ROD requirements.

Application of design level factors to site-specific conditions will be discussed at DEQ’s design review team (DRT) meetings, consistent with DEQ’s practice to date. The DRT is comprised of members of the public, local governments, and members of the environmental remediation and restoration community with technical expertise. The DRT meetings, coupled with the high level of public involvement at the CFR OU (reflected in DEQ’s Community Involvement Plan), will assure a predictable Remedial Design going forward, and assure that the public understands how Remedial Design considerations will be applied.

In addition, technical memoranda will be developed to provide a more definitive bases for certain aspects of Remedial Design (e.g., contamination benchmarks, specific application of in situ treatment). These technical memoranda will be included in the administrative record.

4.3 Scope, Performance, and Cost Differences

This ESD outlines Remedial Design components that are needed to best implement the ROD, based on field conditions involving contamination, geomorphology, vegetation, and groundwater, as well as other considerations, such as ownership, infrastructure, land use, and site-specific remedy requirements.

The performance of the remedy is not altered by this modification.

This modification significantly changes the scope of the floodplain tailings and soils component of the remedy described in the ROD by explicitly adding factors that will be considered during remedial design to determine which of the three classes a given piece of property will fall in. This will result in a different mix of removal, in-situ treatment, and other remediation (i.e., best management practices, institutional controls), for a given Reach and Phase as design is conducted than what was contemplated in the ROD’s original description of the remedy.

The proposed actions available for the floodplain tailings and soils component (removal, in-situ treatment, BMPs, ICs, and no action) have not changed. Nor has there been a significant change to the amount of time needed to implement the remedy. The ROD includes estimates of ten to fifteen construction seasons. DEQ anticipates that using best efforts, Remedial Action will require fifteen construction seasons, in order to limit the duration of impacts on individual landowners and perform Remedial Action in a protective and cost-effective manner. The ROD notes that while the general approach will be to work from the headwaters down, remediation can be done more rapidly and effectively and with less threat to river stability by working on discontinuous stretches of the river. Therefore, work will be performed in a discontinuous manner to prevent jeopardizing the integrity of the floodplain.

Estimated costs associated with the modified remedy remain similar to ROD estimates. The estimated cost of the modified remedy is $112,900,372 at a real discount rate of 3%. This correlates to $97,691,082 at a real discount rate of 5%. For comparison, the ROD estimated $122,017,549 (10 year construction period) and $141,557,274 (15 year period) using a corresponding real discount rate of 3%, and $117,338,024 (15 year period) at a real discount rate of 5%.[4]

5.0 SUPPORT AGENCY COMMENTS

The Support Agency, the U.S. Environmental Protection Agency, supports this ESD.

6.0 STATUTORY DETERMINATIONS

The CFR OU remedy, as modified through this ESD, satisfies CERCLA § 121. The modified remedy provides acceptable overall protection of human health and the environment and complies with applicable or relevant and appropriate requirements, except where previously waived.

Because this remedy will result in hazardous substances, pollutants, or contaminants remaining on site above levels that allow for unlimited use and unrestricted exposure, a statutory review will be conducted no less often than each five years after the initiation of the remedial action to ensure that the remedy is, or will be, protective of human health and the environment.

7.0 PUBLIC PARTICIPATION COMPLIANCE

The public participation requirements of Section 300.435(c)(2)(i) of the NCP, set forth in the Introduction and Statement of Purpose, have been met by making this ESD and supporting information available to the public, including this ESD in the Administrative Record files, publishing a notice in the Montana Standard, the Silver State Post, the Anaconda Leader, the Philipsburg Mail, and the Missoulian, briefly summarizing the ESD, including the reasons for such differences, and making the ESD available online at http://www.deq.mt.gov/fedsuperfund/cfr.mcpx.

[4] The real discount rates of 3% and 5% approximately equal the ROD's 5% and 7% nominal rates of return less an assumed inflation rate of 2%.

Copies of the ESD are available at:

- DEQ's Record Center, 1225 Cedar Street, Helena, Montana 59620, (406) 444-6444.
- EPA's Montana Records Center, 10 West 15th Street, Suite 3200, Helena, Montana 59626, (406) 457-5046.

Copies of the ESD are also available at the following information repositories:

- Hearst Free Library, 4th and Main Street, Anaconda, Montana 59711, (406) 563-6932
- EPA Butte Office, 155 West Granite, Butte, Montana 59701, (406) 782-3838
- Montana Tech, 1300 West Park, Butte, Montana 59701, (406) 496-4281
- Grant-Kohrs Ranch National Historic Site, 266 Warren Lane, Deer Lodge, Montana 59722, (406) 846-2070
- Powell County Planning Office, 409 Missouri Street, Deer Lodge, Montana 59722, (406) 846-3680
- Mansfield Library, University of Montana, Missoula, Montana 59812, (406) 243-6860
- Missoula City/County Library, 301 East Main Street, Missoula, Montana 59802, (406) 721-2665

8.0 REFERENCES

- Montana Department of Environmental Quality. Cost Estimate for Clark Fork River Operable Unit Explanation of Significant Differences. Prepared by CDM Smith (2013).

- Montana Department of Environmental Quality. Final Community Involvement Plan (2012).

- U.S. Environmental Protection Agency. Results of Application of CFR-RipES. Prepared by Ecological Solutions Group, CH2M HILL, and Reclamation Research Group (2007).

- U.S. Environmental Protection Agency. Clark Fork River Operable Unit Record of Decision (2004).

- U.S. Environmental Protection Agency. Clark Fork River Evaluation System—A Remedial Design Tool. Prepared by CH2M HILL, Montana State University Reclamation Research Unit, and Bitterroot Restoration, Inc. (2004).

- U.S. Environmental Protection Agency. A Guide to Preparing Superfund Proposed Plans, Record of Decision, and Other Remedy Selection Documents (1999).

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