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Ref: 8MO

March 21, 2023

Mr. William Howard George
Federal Superfund Project Manager
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1520 East 6th Avenue
Helena, MT 59601

Re: Comments on the Butte Priority Soils Operable Unit (BPSOU) Draft Blacktail Creek Riparian Actions, Pre-design Investigation Work Plan, Draft Sampling and Analysis Plan (dated January 24, 2023)

Dear Wil:

The U.S. Environmental Protection Agency (EPA) is providing comments on the *Butte Priority Soils Operable Unit (BPSOU) Draft Blacktail Creek Riparian Actions, Pre-design Investigation Work Plan, Draft Sampling and Analysis Plan (dated January 24, 2023)*. Please address these comments and submit a revised version and revised crosswalk for EPA review.

General Comments:

1. In accordance with the BPSOU Consent Decree Appendix D Section 3.0 (RD Work Plans) and, more specifically with regard to the Blacktail Creek (BTC) Remedial Actions, Appendix H Section 3.1 (RD Work Plan), “*DEQ shall submit Remedial Design Work Plans (RDWP) for EPA approval for BTC Riparian Actions.*” Additionally, Exhibit 1 to the BPSOU RD/RA Statement of Work (SOW) (RD/RA Schedule for the Further Remedial Elements) indicates that RD Work Plans are to be completed and approved prior to commencing with Pre Design Investigations (PDIs). The BTC Pre-Design Investigation Work Plan (PDIWP) and Unified Federal Policy (UFP) Quality Assurance Project Plan (QAPP) do not refer to a RDWP for the Blacktail Creek Riparian Actions.
2. This combined submittal of the PDIWP and UFP QAPP is, in some ways, excessive and duplicative, and in other ways, conflicting and incomplete. In accordance with Section 3.4(a) of Appendix H to the BPSOU Consent Decree, the PDI Work Plan must include:
 - (1) An evaluation and summary of existing data and description of data gaps;
 - (2) A sampling plan including media to be sampled, contaminants or parameters for which sampling will be conducted, location (areal extent and depths), and number of samples; and
 - (3) Cross references to quality assurance/quality control (QA/QC) requirements set forth in the approved Quality Assurance Project Plan (QAPP).

The intent is that the PDIWP present the complete scope of the project, including a sampling and analysis plan, and refer to the project QAPP for QA/QC procedures and protocols. With this submittal however, DEQ submitted a UFP QAPP which, by design, includes many of the same elements as the PDIWP. The UFP-QAPP is a comprehensive planning document that includes all project quality assurance elements described in ANSI/ASQ E4-2004. A QAPP prepared according to the UFP-QAPP addresses the complete scope of a project, from planning through implementation, assessment, data validation and verification, data usability, and reporting. In addition to analytical laboratory performance, it includes development of data quality objectives (DQOs), sampling design, field sampling activities, and data review. When used in its entirety, it will result in compliance with both EPA QA/R-5 (EPA Requirements for Quality Assurance Project Plans) and EPA QA/G-5 Guidance for Quality Assurance Project Plans) for environmental data collection efforts. The UFP QAPP is essentially a stand-alone document that contains the elements of the WP, SAP and QAPP. For this reason, the PDIWP and the UFP QAPP submittal is excessive and duplicative. However, specific elements of the PDIWP and the UFP QAPP are conflicting and, in some cases, incomplete or not fully developed (e.g., UFP QAPP Worksheet #10 – Conceptual Site Model and Worksheet #11 – Data Quality Objectives). For consistency and completeness, specific components of the PDIWP should also be presented in detail in the UFP QAPP. For example, the discussion of the scope of the sampling program, sampling procedures, analytical procedures and data quality, data management and reporting that is described in the Sampling and Analysis Plan section of the PDIWP should also be presented in various Worksheets in the UFP QAPP.

3. Most quality assurance project plans (QAPP) used in the Clark Fork River sites use the crosswalk (G-5) format and standard outline structure. The Blacktail Creek plans would have been easier to review had the crosswalk format outline structure been followed; that said, the UFP-QAPP is another widely accepted format. Converting the current work plan/UFP-QAPP to the standard QAPP crosswalk format/outline structure would involve some amount of effort and probably not worth the time given the size of this project. What is helpful in UFP-QAPPs is to provide an introductory section at the beginning of the document that discusses the overall framework for the project, general sampling objectives, and background, thus making them easier to review. Future submissions of UFP-QAPPs should consider inclusion on an introductory section.
4. After the comments included in this letter have been addressed by DEQ, it is EPA's expectation that the existing crosswalk will be updated and submitted to EPA for review.
5. Operational details of the x-ray fluorescence (XRF) screening analysis process are inconsistent within and between the work plan and the UFP-QAPP. For example, in Section 3.8.3 of the work plan, the first paragraph states that reading will be taken in situ directly on the surface soil and the next paragraph states that screening will be performed of the core through the plastic sleeve. The sample preparation techniques are likewise inconsistently described with samples sieved, dried, and bagged in the work plan, and cupped or bagged in the SOP in the UFP-QAPP. The details and level of sample preparation has a huge impact on the quality of the results obtained using XRF. While EPA Method 6200, the XRF user manual, and the XRF SOP provide excellent information on sample preparation techniques, they are not specific about which preparation technique will be employed for this project – the actual sample preparation steps to be employed must be described

in the UFP-QAPP. EPA suggests that a meeting be held to discuss XRF usage prior to submitting the next version of the UFP-QAPP.

6. The field XRF measurement SOP and EPA Method 6200 provide general and specific information on XRF analytical and sample preparation processes; however, the UFP-QAPP for this project needs to provide the specifics for XRF usage and sample prep on this project.
7. The information presented in Worksheet #10 of the UFP QAPP is not a conceptual site model (CSM). EPA (2012) defines a CSM as comprehensive graphical and written summary of what is known or hypothesized about environmental contamination at a site and the relationships among key site information that are pertinent to decision-making. A CSM is a representation that evolves over the life cycle of site investigation and cleanup efforts. It provides a platform for evaluating the data gaps and related uncertainty associated with site history and operations; geology, hydrogeology and hydrology; contaminant sources, release mechanisms and fate and transport; potential receptors and exposure pathways. For the BTC Riparian Actions PDI, the CSM should describe the current understanding of the physical and chemical characteristics of the tailings and contaminated soils and the hydrogeologic characteristics of these materials as they relate to contaminant fate and transport. The CSM should not only present what is known and understood about the system, but also present what is not known or not well understood (data gaps). The identification of data gaps in the CSM is critical for developing appropriate DQOs that will provide the for collection of the appropriate quantity and quality of data to make remedial decisions regarding site cleanup.
8. The information presented in Worksheet #11 of the UFP QAPP is not DQOs. The text is presented in the form of the seven steps of the DQO process but includes more of a narrative on what HGL is planning to do (i.e., “HGL’s scope for this project is to develop Site-specific project plans to be approved by MDEQ and other Stakeholders before work begins”). The DQOs in the UFP QAPP are underdeveloped and really do not define principal study questions, identify data gaps, or state how the data gaps will be filled. The DQO Process is used to establish performance and acceptance criteria, which serve as the basis for designing a plan for collecting data of sufficient quality and quantity to support the goals of the study. Use of the DQO Process leads to efficient and effective expenditure of resources; consensus on the type, quality, and quantity of data needed to meet the project goal; and the full documentation of actions taken during the development of the project. DQOs must be detailed and specifically state what the objectives for the project are, what data are available, what data gaps there are, and generally how the scope of work will fill the data gaps by collecting data with sufficient quality to achieve the DQOs to support remedial decisions.
9. The PDIWP discusses the potential to encounter hydrocarbons, municipal waste, or waste containing asbestos during field activities. However, the QAPP does not discuss any of these potential wastes. Additionally, the mention of asbestos containing materials in the PDIWP seems to be rather brief and may not include the necessary procedures/planning to properly identify/dispose of this waste.
10. Neither the PDIWP nor the UFP QAPP clearly describe the direct push technology (DPT), sonic and Vibracore drilling and sample collection methods or where and when each of the respective methods will be used. Both documents mention the use of DPT and sonic drilling at the same

locations. For example, Section 2.4.4 of the PDIWP notes limitations of DPT and indicates that sonic drilling will be used instead, however Worksheet #17 of the UFP QAPP does not include sonic drilling in the drilling methods and Worksheet #18 states that DPT or Vibracore will be used. Additionally, the UFP QAPP does not contain a standard operating procedure (SOP) for the sonic or Vibracore drilling and sampling methods, but it does include a SOP for DPT.

11. It is not clear where or how data collected under the BTC Riparian Actions PDI will be stored and managed over the long-term. These data must be included in the BPSOU site-wide database so that it is available to data users and stakeholder representatives.

Specific Comments:

Pre-design Investigation Work Plan

1. List of Acronyms and Abbreviations. The acronyms "DEQ" and "MDEQ" are both included in the acronym list. For clarity and consistency, please use one or the other and apply throughout the document.
2. Section 1.1 Site Location and Description Paragraph 2. The section discussing construction dewatering is unclear, please revise to indicate more clearly what each party is responsible for.
3. 2.3.1 Stream Characterization of Blacktail and Silver Bow Creeks Paragraph 2. Figure 1 does not show this data, should Figure 2 be referenced here? Additionally, Figure 2 only shows the 1890 stream overlay, the 1895 overlay is not included.
4. 2.4.2 Volume and Quality of Groundwater for Dewatering Paragraph 2. This section notes that only one pumping test can potentially provide insight on construction dewatering. Is only one test sufficient to determine the effects of dewatering?
5. Section 3.7, Page 3-7. Because this area has been disturbed since the tailings were deposited, there may not be a clear break from impacted to unimpacted. It is recommended that the XRF be used as a guide for impacted soil and proceed 2 to 5 feet into unimpacted material depending on conditions.
6. Section 3.7, Borehole Drilling Procedures. A more detailed description of decontamination procedures is needed. For example, what will the wash water applied with the high-pressure washer consist of, Alconox and distilled water?
7. Section 3.8.3, XRF Screening Analysis. In the first paragraph, it is stated that a sample stand will be utilized, but no further mention of sample stand usage is mentioned in the work plan or UFP-QAPP. Please specify when the sample stand will be employed. In the second paragraph, EPA is concerned about the usefulness of the results that will be obtained analyzing through the thick plastic core tube with moist or wet samples possibly not in an optimal position for this analysis. Please briefly specify the alternative steps if the COC break in concentrations cannot be identified. In the third paragraph, please specify the sieve size and type that will be used.
8. Section 3.8.4, Selection of Samples for Laboratory Analyses. Is mercury being analyzed? Preservation and holding time criteria will need to be followed.
9. Section 3.8.4, Selection of Samples for Laboratory Analysis. In the second paragraph, it is not clear how Table 1 will be used to help determine which samples will be submitted to the laboratory. Please clarify. EPA suggests that XRF be used to identify samples well below or well above an action level, and those samples relatively near an action level be submitted to the

laboratory for analysis. For example, at unreclaimed sites at BPSOU, XRF sample results within 35% of an action level are submitted to the laboratory for analysis.

10. Section 3.8.4. Similar to the previous comment on Section 3.7, there may not be a clear break from impacted to unimpacted. Additional samples may be needed to clearly identify the vertical limit of impacted soil.
11. Section 3.10.4, Laboratory Custody: The full reference for the 2016 EPA document should be presented in this section. This reference should also be added to the reference section. Please identify which document is being referred too? Is it the Sampler's Guide: CLP Guidance for Field Samplers, November 2020? If so this reference in this section needs to be updated to the latest version.
12. Section 3.11.1, Field Duplicates: Duplicate and replicate XRF samples should be discussed in this section.
13. Section 3.11, Field Quality Control: There should be a discussion of equipment blanks (check field decontamination procedures) and field blanks (check cross-contamination during sample collection, preservation, and shipment, as well as in the laboratory). Also, to check sample containers and preservatives), temperature blanks, MS/MSDs, samples.
14. Section 4.1. This section indicates the objective is to collect at least 60 pairs for regression analysis. Worksheet #20 in the UFP QAPP indicates 23 samples to be analyzed in the laboratory. Inductively coupled plasma (ICP) results serve a critical basis for the sampling program. Please explain the rate of ICP analysis and revise this section and Worksheet #20 as needed.
15. Section 4.1, Data Quality Objectives, Number 1. Mercury is listed to be analyzed. Preservation and holding times need to be identified for mercury. The holding time for mercury in soil is 28 days and soils samples must be preserved at $\leq 6^{\circ}\text{C}$ (but not frozen).
16. Section 4.3, Laboratory Quality Assurance/Quality Control: The latest version of the EPA CLP SOW should be referenced in this section. SFAM01.1, November 2020. No section on data validation, data quality. Please include.
17. Tables 5 and 6. These tables are not referred to in the document. There seems to be some missing explanatory text. Please revise.
18. Table 6. The work plan Table 6 indicates plastic bags for the soil samples to be analyzed for metals while Worksheets #19 and #30 in the UFP QAPP indicate glass jars. Please clarify.
19. Table 6: The holding time and preservation criteria for mercury needs to be corrected to 28 days for soil with a preservation criteria for $\leq 6^{\circ}\text{C}$ (but not frozen).
20. Table 6: The laboratory should be contacted to confirm the holding times, container sizes and preservation criteria before sampling.
21. Figure 3. The difference between Sonic Priority 1 and Sonic Priority 2 sampling locations is not clear. These sampling techniques/procedures need to be clearly described in the PDIWP.

UFP QAPP

1. Document. Footer includes USEPA Region 7, change this to Region 8. Additionally, the footer changes from USEPA to MDEQ between pages iii and iv.
2. Worksheets #1 & 2. There are several previous reports and investigations that are relevant to this project and referenced later in this document, please add these to this section.

3. Worksheets #3 & 5. MDEQ and EPA personnel/contacts for this project must be included in Figure 3.1.
4. Worksheet #6. The list of communication pathways appears to be missing several important items included in the UFP worksheets. Please review and update.
5. Worksheet #10. The PDIWP discusses additional COCs, including hydrocarbons and potential wastes such as municipal waste and waste containing asbestos, these should be included in the CSM.
6. Worksheet #11. Worksheet #11 does not present or describe DQOs. Please address.
7. Worksheet #12, Section 12.1. The EPA National Functional Guidelines use an absolute difference of $\leq 2RL$ when sample results are less than 5 times the RL. Please update accordingly.
8. Worksheet #12, Section 12.1. The LCS criteria is 70-130% for LCS/LCSD. MS/MSD criteria for mercury is 75-125%.
9. Worksheets #14/16. Please include the deliverables associated with each task.
10. Worksheet #14/16. In “Analysis Tasks”, in addition to screening on unprepared samples, the work plan discussed XRF analysis of dried and prepared samples. Please add this analysis to the table.
11. Worksheet #15. Please include a reference for the project-specific analytical method quantitation limits.
12. Worksheet #17. This worksheet does not present the sampling design and rationale.
 - a. Elsewhere in the UFP QAPP and the PDIWP sonic drilling is listed as the method of drilling. However, sonic drilling is not included within this section. Please review and revise.
 - b. This section is missing multiple elements of the sampling design and rationale that are included in the PDIWP. Please expand this discussion to include a comprehensive description of the sampling design and rationale.
13. Worksheet #18. The method of drilling listed here does not align with the methods specified in other sections of this UFP QAPP and within the PDIWP. Please review and revise.
14. Worksheet #18 and Worksheet #20. Only XRF samples that have been dried, sieved, and prepared should be used to assess COC concentrations and samples to be submitted to the laboratory. Please revise accordingly.
15. Worksheet #19 & 30.
 - a. Please indicate which laboratory is being used.
 - b. Please indicate how samples will be delivered to the lab.
 - c. Please include or reference worksheets with the accreditation/certificates held by the chosen laboratory.
 - d. Please indicate the data package turnaround time.
16. Worksheets #19 and #30. Temperature can be 6 degrees C. Please confirm the size of jar.
17. Worksheet #20. The number of samples being submitted to the laboratory and the field duplicates listed for XRF in PDIWP and UFP QAPP are inconsistent. Please review and revise.

18. Worksheet #21.
 - a. What do the reference numbers used in this table refer to? They do not appear on the SOPs included in Appendix A or in the bookmarks for this document. Also, the SOPs in Appendix A are not listed in the same order as included in the table.
 - b. SOP 403.01 is not included in Appendix A. This SOP is for hydrocarbon sampling, unclear if this is needed or not.
 - c. The footnote is not used in the table.
 - d. A SOP is included for DPT, however no SOPs are included for sonic drilling or Vibracore. Please review drilling methods and include necessary SOPs.
19. Worksheet #22. Normally, XRF check samples are run every 20 samples. This should be specified in the frequency for “Instrument blank check” and “Calibration verification check”. Please modify accordingly.
20. Worksheets #26 & 27. Page 35: The header has a superscript at the end “...of this worksheet and field SOP¹”, the corresponding footnote is missing.
21. Worksheet #29. Please include storage locations for these documents and records.
22. Worksheet #36: The EPA National Functional Guidelines need to be updated to the November 2020 version. Stage 4 validation being performed on any of the data?
23. Worksheet #37: The data usability assessment must be performed in accordance with the Clark Fork River Superfund Site Investigation (CFRSSI) guidance documents, methods and procedures.
24. References: EPA references should be added to this section.
25. Figure 18.1. The difference between Sonic Priority 1 and Sonic Priority 2 sampling locations is not clear. These sampling techniques/procedures need to be clearly described in the UFP QAPP.

If you have any questions or concerns, please call me at (406) 457-5019.

Sincerely,

Nikia Greene
Remedial Project Manager

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