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Re: Response to Comments on Draft RI/FS Work Plan
Columbia Falls Aluminum Company

Roux Associates, Inc. (Roux Associates), on behalf of Columbia Falls Aluminum Company (CFAC), has prepared this response to the written comments provided by EPA during the October 7 and 8, 2015 technical meeting. Each of the comments are presented below, followed by Roux Associates' response.

General Comments

1) Geophysical Survey – This section of the SAP lacks sufficient detail to determine appropriateness of the proposed geophysical surveys. This section needs further development including a list of source areas with the proposed survey types as well as source areas where no geophysical surveys are proposed and the reasoning for conducting a survey or not at each source area.

   Section 4.4 of the SAP was revised to include additional information about the proposed geophysical survey scope of work. Section 4.4 also discusses the source areas to be evaluated.

2) Background Soil Sampling – Although the Site Assessment report included background soil sampling results, these are insufficient for a remedial investigation. Background soil samples should be collected from surface and subsurface soils from at least eight additional locations thought to be un-impacted by solid or liquid waste. When selecting locations, areas potentially impacted by aerial emissions from the site should be excluded.

   Eight background soil borings were added to the Phase I Site Characterization Scope of Work as described in the RI/FS Work Plan Section 5.5.

3) Impacts of Aerial Emissions – According to air permits for the facility, allowable emissions included total fluoride and polycyclic organic particulate material. The background soil sampling task should consider and include these contaminants of potential concern (COPCs). If locations thought to be background have elevated or outlier concentrations of these COPCs, additional soil sampling should be conducted to determine the extent of soil impacts from fugitive emissions.

   The eight background locations described in RI/FS Work Plan Section 5.5 will consider the COPCs described in comment #2. If the data collected at the background locations have

elevated or outlier concentrations of the COPCs, CFAC will discuss with the USEPA potential additional sampling locations.

4) Existing Well Logs – Please include an appendix containing logs for all site wells and soil borings with identifiers, a table of location coordinates and well completion intervals, and a map with all wells/borings posted.

   A table with location coordinates and well completion intervals is included in the RI/FS Work Plan as Table 1. All of the existing well logs available during preparation of the RI/FS Work Plan and a map for reference are included as Appendix D.

5) Main Plant Area – This portion of the facility has significant potential to be a source area; however investigation is limited to dry wells. A subsurface investigation should be conducted within the building footprint in areas with significant potential for discharge or release of site contaminants to soil and ground water.

   As agreed upon during the technical meetings held on October 7 and 8, 2015, investigation within the footprint of the potline buildings within Main Plant Area will not be conducted during the Phase I Site Characterization given the ongoing plant demolition activities. If accessible, two soil borings will be completed within the area identified as the cathode soaking pits, located on the north-central part of the Main Plant. Additionally, as part of the Phase I Site Characterization, monitoring wells will be installed upgradient and downgradient of the Main Plant. The water quality data collected from these locations will be considered to evaluate if the Main Plant Area is acting as a potential source area. Following review of the Phase I data, subsequent investigation of the Main Plant Area may be conducted during Phase II, in coordination with the ongoing demolition activities.

6) Investigation Derived Waste – A plan for disposition of investigation derived waste (IDW) must be included in both the RI/FS Work Plan and the SAP.

   A plan for disposition of IDW is currently being prepared and will be included in the final RI/FS Work Plan and SAP. The IDW Plan is discussed in Section 5.2.6 of the RI/FS Work Plan

7) Evaluation of potential soil boring locations is identified in RI/FS Work Plan Section 5.2.2, but is not carried into the SAP.

   As agreed upon during the technical meetings held on October 7 and 8, 2015, discussion of soil boring locations and rationale are provided in both the RI/FS Work Plan and the SAP.

8) The sections in the work plan describing risk assessment approaches (Sections 6.1, 6.2, and 6.3) are very general and brief. Although the RI/FS Work Plan specifies that Baseline Human Health Risk Assessment (BHHRA) and Ecological Risk Assessment (ERA) work plans are to be prepared after completion of the Phase I Site Investigation, sufficient detail regarding the Conceptual Site Model (CSM) are not provided in these sections to support the collection of data

for risk assessment needs or to fulfill the risk assessment objectives identified in the Executive Summary.

Additional details were added to Section 6.1, 6.2 and 6.3 to address this comment as well as the specific comments related to risk assessment.

9) The data quality objectives (DQOs) in the SAP should identify the Remedial Investigation (RI) areas (e.g., source area and operational area) that will be investigated. The areas identified should be consistent with those identified in the RI/FS Work Plan. The RI/FS Work Plan lists six RI areas and does not separate source area soil from operational area soil.

The RI Areas were added to Section 3.0 of the SAP, under the first major bullet.

10) Any revisions requested in the SAP should also be incorporated into the RI/FS Work Plan as applicable and vice versa.

Any revisions requested in the SAP were also included in the RI/FS Work Plan.

Specific Comments

1) RI/FS Work Plan and Sampling and Analysis Plan – Change "chemicals of potential concern" to "contaminants of potential concern" throughout the documents.

COPCs were changed to contaminants of potential concern universally throughout both the RI/FS Work Plan and the SAP.

2) RI/FS Work Plan and Sampling and Analysis Plan – Add Target Compound List (TCL) to the list of acronyms and spell it out the first time it is used in each document. Change the headings in SAP Table 7 to use TCL for organic compounds.

Target Compound List (TCL) was added to the list of acronyms and spelled out in Section 4.6.1 in the SAP and Section 5.3.2 in the RI/FS Work Plan. The headings were corrected in SAP Table 7.

3) RI/FS Work Plan Section 2.0, page 3 - Include a section that describes land use in the vicinity of the Site. For example: what is the distance to the nearest residence and nearest groundwater wells used for drinking water; are onsite wells used for potable water; is the area near the site used for recreational purposes such as fishing or hunting; etc.

The requested information was provided in Section 2.1 of the RI/FS Work Plan.

4) RI/FS Work Plan Section 2.6 – Add Montana Species of Special Concern with potential to be at the site. It is expected that this will include western toad, westslope cutthroat trout, and bull trout.

Based on a search of the Montana Fish, Wildlife & Parks (FWP), available online at http://fwp.mt.gov, there are 37 different Montana Animal Species of Concern found in Flathead County, Montana. A table and text was added to Section 2.6. of the RI/FS Work Plan with this information.

5) RI/FS Work Plan Section 2.8, pages 16 to 23 – Please ensure that, when using historic regulatory screening and action levels that these levels are qualified by the date they were established. For example, on page 23, the 3rd bullet in section 2.8.14 states that the USEPA Tapwater Regional Screening Level (RSL) for cyanide is 1.5 µg/L. In the June 2015 RSL table the Tapwater RSL for cyanide is listed as 0.15 micrograms per liter (µg/L). If the Tapwater RSL that is quoted in the text (1.5 µg/L) was from an earlier version of the RSLs, please state so.

   References to previous criteria within Section 2.8 were removed or the historic date was referenced.

6) RI/FS Work Plan Section 2.8.1, page 16, 2nd paragraph, 2nd sentence – Change reported units for cyanide and fluoride in soil samples from milligrams per liter (mg/L) to milligrams per kilogram (mg/kg).

   The units in Section 2.8.1 were changed as requested.

7) RI/FS Work Plan Section 2.8.14, page 22 - Given that this investigation is very recent, it is suggested that more detail about the investigation be provided.

   Additional details regarding the USEPA Site Reassessment were provided in Section 2.8.14 as requested.

8) RI/FS Work Plan Section 2.8.15, page 23 - Please provide more details about the residential water well sampling. How many wells were sampled? It appears that these data may be described in more detail in Section 3.1.3; if this is the case please reference this section. Please also provide more detail about the Whole Effluent Toxicity Test. What is the relationship of the test between the Seep and the Flathead River? Also revise the sentence describing the results ("The ground water discharging to the Flathead River and the Flathead River passed the WET tests indicating no acute toxicity").

   The language in Section 3.2.15 has been updated as requested to provide more details regarding the residential well sampling and the WET testing. In addition, this section has been updated to reflect that two additional rounds of residential well sampling (for a total of four) have now been completed.

9) RI/FS Work Plan Section 3.1.3, page 30 -The statement that the site-related COPCs are not impacting ground water quality in the residential area is not substantiated.

The language in Section 3.1.3 was modified and reflects the current understanding of site conditions.

10) RI/FS Work Plan Section 3.1.4, page 31 - Identify what chemicals exceeded Montana Aquatic Life Acute and Chronic criteria in surface water from the percolation ponds. Clarify the statement: "Five of the samples were collected within surface waters that may be potential receptors (four from the Flathead River and one from Cedar Creek)."

Section 3.1.4 was modified as requested in Comment #10.

11) RI/FS Work Plan Section 3.1.5, page 32 - The RI/FS Work Plan should discuss if pesticides were used on the Site and if pesticides detected in sediment could be Site-related.

CFAC has no knowledge of pesticide use at the Site, other than routine pesticides that may have been utilized for maintenance in the Main Plant Area. Section 3.1.5 was updated with additional language about pesticide use and the previous sampling results for pesticides.

12) RI/FS Work Plan Section 3.3.2.2, page 50 – Add sediment porewater to the section of the CSM that addresses surface water and sediments.

Sediment pore water was added to Section 3.3.2.2.

13) RI/FS Work Plan Section 3.4.2 – Add a subsection describing in situ treatment of ground water as a remedial alternative for the FS.

In-Situ treatment of groundwater as a preliminary identified remedial alternative was added in Section 3.4.2.3.

14) RI/FS Work Plan Section 3.6.1, page 56 - RSLs do not provide screening values for soil vapor concentrations. Please provide an appropriate (applicable, relevant and appropriate requirement (ARAR) or to-be-considered (TBC) for soil vapor.

EPA RSLs for indoor air are identified as a conservative screening value for soil vapor concentrations. The EPA RSLs are described as a preliminary TBC in Section 3.6.1.

15) RI/FS Work Plan Section 3.6.2 – Please ensure that any ARARs or TBCs pertaining to underground injection of water are addressed.

Potential ARARs relating to the underground injection of water were added to RI/FS Work Plan Section 3.6.2.

16) RI/FS Work Plan Section 4.0, page 59 - The second paragraph states that the DQOs are presented in the quality assurance project plan (QAPP). They are presented in the SAP with numerous revisions needed. If they are also presented in the QAPP (this document was not available for review), changes required in the SAP should also be reflected in the QAPP.

The DQOs are presented in the Sampling and Analysis Plan (SAP), which includes both the Field Sampling Plan (FSP) and the Quality Assurance Project Plan (QAPP). The SAP was prepared in accordance with the EPA guidance document titled "Guidance for Quality Assurance Project Plans EPA QA/G-5". The DQOs were revised as discussed below in comments numbered 73 through 80.

17) RI/FS Work Plan Section 4.1, page 59 - This section identifies data needs for the RI. Although implied, the specific need to obtain data adequate for risk assessment purposes is not acknowledged. This section also identifies that one of the goals of the RI is to identify potentially complete exposure pathways (considering current and also potential future land use) and evaluate current and future human health and ecological risks posed by COPCs present at the Site. The RI/FS Work Plan does not sufficiently identify procedures to fulfill this goal in the following sections.

Section 4.1 has been updated to specifically acknowledge the need to obtain data to support completion of a risk assessment in accordance with EPA Guidance. Additional information about the risk assessment process was added to RI/FS Work Plan Section 6.0.

18) RI/FS Work Plan Section 4.1, page 60 and SAP Section 6.5.3, page 33 – A data need for landfills includes a topographic survey; however, the SAP does not include a task for conducting a survey. Please add a section to the SAP to collect the needed data.

A topographic survey of the landfills will be conducted during subsequent phases of the investigation. Section 4.2 of the RI/FS Work Plan and Section 4.2 of the SAP were updated to provide discussion of the phased investigation approach and a description of data collection activities that are expected to be conducted after Phase 1.

19) RI/FS Work Plan Section 4.1, page 61 and SAP Section 6.5.3, page 33 – A data need for landfills is to characterize the physical characteristics of the existing cap; however, the SAP does not include a task for collecting these data. Please add a section to the SAP to collect the needed data.

Physical characteristics of the existing landfill caps will be conducted during subsequent phases of the investigation. Section 4.2 of the RI/FS Work Plan and Section 4.2 of the SAP were updated to provide discussion of the phased investigation approach and a description of data collection activities that are expected to be conducted after Phase 1.

20) RI/FS Work Plan Section 4.1, page 61 and SAP Section 6.5.3, page 34 – A data need for Site hydrogeology includes hydraulic properties of the various hydrogeologic units at the Site; however, the SAP does not include any activities to gather these data. Please inventory existing data and develop a section in the SAP to collect additional data to fulfill the data needs for the RI.

Hydraulic properties of the various hydrogeologic units will be evaluated throughout the RI. During Phase I, a number of soil samples will be selected for grain size, bulk density and moisture content analysis. The results from Phase 1 will be evaluated when selecting the well locations to be utilized in Phase 2 for aquifer/slug testing to determine the hydraulic properties. Section 4.2 of the RI/FS Work Plan and Section 4.2 of the SAP were updated to provide discussion of the phased investigation approach and a description of data collection activities that are expected to be conducted after Phase 1.

21) RI/FS Work Plan Section 4.1, page 62 and SAP Section 6.5.3, page 34 – Please change "…to confirm the presence, if any, of CPOCs" to "…determine the concentrations of COPCs".

The change was made in RI/FS Work Plan Section 4.1 and SAP Section 6.5.3.

22) RI/FS Work Plan Section 4.1, page 63 and SAP Section 6.5.3, page 35 – A data need for ground water quality is geochemical data for a fate and transport evaluation. The specific data needed are not identified in the RI/FS Work Plan or SAP. Please add a section to the SAP to identify the specific data needs and, if appropriate, add a section to collect the needed data.

RI/FS Work Plan Section 5.7 and SAP Section 4.11 were added to describe plans to collect data related to geochemical fate and transport evaluation during the Phase 1 Site Characterization.

23) RI/FS Work Plan Section 4.1, page 62 – Add sediment porewater to the section identifying data needs for surface water and sediments.

Sediment porewater was added to RI/FS Work Plan Section 4.1 as a data need for surface water and sediments.

24) RI/FS Work Plan Section 4.1, page 62 –A data need for surface water quality is to evaluate seasonal variations. The RI/FS Work Plan and SAP lack specificity on obtaining the needed data. Please add text to SAP section 4.9 detailing the sampling frequency to collect the needed data.

Sections 5.6.2 and 5.6.3 of the RI/FS Work Plan specify that groundwater and surface water samples will be collected on a quarterly basis for one year to evaluate seasonal variations as part of the remedial investigation. SAP Sections 4.8 and 4.9 were modified to include text outlining the sampling frequency of once per quarter for groundwater and surface water respectively.

25) RI/FS Work Plan Section 4.2, page 64 - This section states the results of the Phase I Site Characterization will be used to prepare the Risk Assessment Work Plan. Risk assessment data needs should be considered as one of the primary goals of the Phase I Site Characterization so that any additional effort required in the planned Phase II investigation is minimal. Data currently exists to develop data sampling plans sufficient for risk assessment needs. Goals of the Phase II Investigation are not clearly defined, but should include provisions for any data gaps identified in the Phase I investigation. This section also states that "At the conclusion of the

Phase 2 Risk Assessment, the approach to analyze the data and draw conclusions will be based upon accepted Risk Assessment methodology to be specified in the Risk Assessment Work Plan in accordance with applicable USEPA guidance." This statement is vague and does not provide substantial information. Provide major USEPA and Montana Department of Environmental Quality (MDEQ) risk assessment guidance sources or reference Section 6.0. Also, what is the Phase 2 Risk Assessment?

RI/FS Work Plan Section 4.2 was revised to address the above comments.

26) RI/FS Work Plan Section 5.2.4.1, page 70 and SAP Section 4.5, page 11 – Please describe how the soil gas sampling point will be sealed. Also, to test for potential short-circuiting of the surface seal, a tracer like helium gas should be used.

The soil gas sampling point will be sealed at the surface utilizing modeling clay around the sampling probe. Helium gas will be used as a tracer to test for potential short-circuiting. Section 5.2.4.1 of the RI/FS Work Plan and Section 4.5 of the SAP were modified to describe these procedures.

27) RI/FS Work Plan Section 5.3.1, page 72 – Collection and analysis of landfill cap soil samples are indicated and this section states that "The details regarding each of the above elements are provided in the SAP"; however, there is no accompanying section in the SAP.

Landfill cap samples will be evaluated in the Phase II Site Characterization and therefore was removed from RI/FS Work Plan Section 5.3.1. The phased approach to the RI is discussed in Section 4.2 of the RI/FS Work Plan and includes a discussion of data needs currently planned to be addressed in Phase II.

28) RI/FS Work Plan Section 5.3.2, page 73 and SAP Section 4.6.1, page 14: At deep boring or well locations where shallow contamination is known or evident based on field observations and analyses, the boring shall be cased or otherwise sealed to prevent cross-contamination into the deeper water-bearing zones. Make consistent with SAP section 4.7, page 18.

RI/FS Work Plan Section 5.3.2 and SAP Section 4.6.1 was modified to include text similar to SAP Section 4.7.

29) RI/FS Work Plan Section 5.3.2, page 73 and SAP Section 4.6.1, page 14 - If contamination is evident in the 10 to 12-foot interval soil sample, drilling and sampling shall proceed until contamination is no longer evident in the soil samples, until ground water is encountered, or the limit of the equipment has been reached.

RI/FS Work Plan Section 5.3.2 and SAP Section 4.6.1 was modified to address additional sampling beyond the 10 to 12 foot interval.

30) RI/FS Work Plan Section 5.3.3, page 74 and SAP section 4.10, page 22 – At least three additional dry wells should be evaluated by drilling and sampling via a soil boring.

RI/FS Work Plan Section 5.3.3 and SAP Section 4.10 were modified to include three additional soil borings beneath dry wells.

31) RI/FS Work Plan Section 5.4, page 75 – In addition to the investigation proposed, a less intensive soil sampling strategy should be developed for other areas of the facility where operations may have occurred, but the likelihood of spills and disposal operations are lower. This generally includes most unforested areas at the site.

Soil sampling at eight locations within the background, unforested areas was added to Section 5.5 of the RI/FS Work Plan and Section 4.6.3 of the SAP. The proposed locations are shown on Figure 17 of the RI/FS Work Plan and Figure 10 of the SAP.

32) RI/FS Work Plan Section 5.5 – Please add a section describing sampling of sediment porewater.

Sediment porewater samples will be collected for analysis in the Phase II Site Characterization. The phased approach to the RI is discussed in Section 4.2 of the RI/FS Work Plan and includes a discussion of data needs currently planned to be addressed in Phase II.

33) RI/FS Work Plan Section 5.5.2, page 77 and SAP Section 4.8, page 19 – Selected wells should be fitted with pressure transducers and data loggers to document the seasonal fluctuations of ground water levels.

Pressure transducers will be installed in at least six (6) monitoring wells onsite to document seasonal changes in groundwater elevations. The use of pressure transducers was added to Section 5.6.2 of the RI/FS Work Plan and Section 4.8 of the SAP.

34) RI/FS Work Plan Section 5.5.2, page 77 and SAP Section 4.8, pages 18 and 19 – The RI/FS Work Plan indicates that wells will be sampled quarterly for one year while the SAP omits this information. Please clarify in the SAP that ground water samples will be collected quarterly for a year. Additionally, site production wells should be sampled where possible to obtain data from the deeper water-bearing units.

The SAP Section 4.8 was modified to describe the proposed quarterly sampling of groundwater. The RI/FS Work Plan Section 5.6.2 and SAP Section 4.8 were modified to state that the feasibility of sampling the production wells, and whether such sampling will produce representative groundwater data, will be evaluated.

35) RI/FS Work Plan Section 5.5.2, page 78 – Nutrients should be included in the analyte list for ground water.

Nutrients were added to the analyte list for groundwater provided in Section 5.5.2 of the RI/FS Work Plan and Section 4.8 of the SAP.

36) RI/FS Work Plan Section 5.5.3, page 80 and SAP Section 4.9, page 20 – Whenever possible, discharge should also be measured. This includes Cedar Creek, Cedar Creek overflow and any other flowing water. For the Flathead River, the provisional instantaneous discharge measurement from USGS Station 12363000 should be recorded. The on-site staff gages should be surveyed and correlated to USGS station 12363000.

The discharge in Cedar Creek and Cedar Creek Drainage Overflow will be measured during each quarterly sampling event. A temporary staff gauge will be installed in the Flathead River, surveyed, and correlated to USGS Station 12363000. RI/FS Work Plan Section 5.6.3 and SAP Section 4.9 was modified to describe the discharge measurements that will be collected.

37) RI/FS Work Plan Section 5.5.3, page 80, last paragraph and SAP Section 4.9, page 21 – Change "Prior to sample…" to "As a part of sample…" and change "screened" to "analyzed."

The requested text changes were made in RI/FS Work Plan Section 5.6.3 and SAP Section 4.9.

38) RI/FS Work Plan, Section 5.5.4, page 80 – Gravel and larger sized grains shall be removed from the sample prior to analysis.

Gravel and larger sized grains will be removed in the field prior to shipment of samples. Additional text was added to RI/FS Work Plan Section 5.6.4 and SAP Section 4.9.

39) RI/FS Work Plan Section 6.0, page 81 - This section does not provide sufficient detail regarding the approach that will be used to evaluate potential threats to human health and the environment. Because the Phase I investigation will provide substantial data that will be used in the risk assessments it is vital to develop investigation objectives that will support risk assessment. It would therefore be beneficial to supplement this section with additional discussion of the preliminary site conceptual model discussed in Section 3.3. This section should be revised to clarify what steps will be provided in the BHHRA Work Plan versus what steps will be provided in the BHHRA. This section should provide a general description of how and what criteria will be used to identity COPCs, describe current and potential future land uses, identify preliminary exposure areas and media of concern, and potential exposure pathways of concern. Because the actual methodology for the BHHRA is not described, there is concern for how the data from the Phase I Site Investigation will be interpreted to select COPCs, determine exposure areas, and estimate exposure point concentrations.

Additional details have been added to Section 6.0, 6.1, 6.2 and 6.3. This includes additional discussion of the preliminary CSM, the screening criteria and how they will be used to identify COPCs, recognition that future land use will need to be addressed in future updates of the CSM, and preliminary exposure areas. In addition, the text has been revised to clarify what will be provided in the baseline risk assessment work plan versus what steps will be conducted subsequently.

40) RI/FS Work Plan Section 6.1, page 81 - This section provides a general list of guidance that will be used in the BHHRA .The list of Risk Assessment Guidance for Superfund (RAGS) guidance should also include RAGS Part F. The rationale used for the list of additional sources listed should be provided.

The list of Risk Assessment Guidance for Superfund (RAGS) guidance has been added updated to include RAGS Part F. The rationale for the list of additional sources has been added, specifically these sources are listed on MDEQs website.

41) RI/FS Work Plan Section 6.1, page 82, 2nd paragraph - Revise to clarify how existing data and data from the Phase I Site Characterization will be combined and used in the BHHRA. For example the paragraph states "The BHHRA will include a summary and evaluation of existing data and selection of COPCs for each media. The evaluation of existing data will also identify additional data required to complete the BHHRA so that any data needed can be collected as part of the Phase 2 Site Characterization program." Because the BHHRA Work Plan will be prepared after the Phase I Site Investigation it appears that an initial data evaluation is required in the BHHRA Work Plan to identify any additional data needs.

It is agreed that an initial data evaluation is required in the BHHRA section of the Baseline Risk Assessment Work Plan (BRAWP). The text has been revised to make this point clear.

42) RI/FS Work Plan Section 6.1, page 82, 3rd paragraph - Revise to differentiate tasks that will be completed in the BHHRA Work Plan versus those that will be completed in the BHHRA. As described, the BHHRA Work Plan essentially comprises the majority of the steps of the BHHRA including: exposure analysis, data evaluation, selection of COPCs, toxicity assessment, and a description of the methodology for risk characterization and uncertainty analysis. Only the calculation of risks will not be included. Therefore, it is essential to provide data adequate for risk assessment in the Phase I Investigation. Comments were made on the SAP that are relevant to data needs for the BHHRA. In order to provide all of the information identified in this section (e.g. selection of COPCs) the dataset that will be used should be as complete as possible to evaluate potential exposures.

This section has been revised to differentiate tasks that will be completed in the BRAWP versus those that will be completed subsequent to the BRAWP. Specifically, it has been clarified that BRAWP will provide data evaluation and COPC selection, definition of exposure areas and refinement of exposure pathways via an updated CSM. The BRAWP will also provide methodology for completing the exposure analysis, toxicity assessment and risk characterization, but these tasks will be completed subsequent to the BRAWP.

43) RI/FS Work Plan Section 6.2, page 82 - The description of the ERA approach provided in this is section is very basic and does not provide details about specific tasks that are necessary for the ERA such as ecological characterization, habitat characterization, and identification of threatened and endangered species. However, Appendix B provides a very detailed description

of the Screening Level Ecological Risk Assessment (SLERA) process and should be summarized in this section.

RI/FS Work Plan Section 6.2 was revised and additional information has been added to address the above comment.

44) RI/FS Work Plan Section 6.3, page 83 - This section identifies a Baseline Risk Assessment Work Plan (BRAWP) which seems to be a different document from the BHHRA Work Plan and the ERA described previously. Does this mean that the BHHRA Work Plan and the Baseline Ecological Risk Assessment (BERA) Work Plan (if warranted) will be produced in one document?

The BRAWP will include separate sections to address the BHHRA and the BERA (if the results of the Screening Level Ecological Risk Assessment (SLERA) indicate that a full BERA is warranted).

45) RI/FS Work Plan Section 8.1.2, page 88 - At a minimum, it is expected that the datasheets will document the unique sample identifier assigned, provide information on whether the sample is representative of a field sample or a field-based quality control (QC) sample (e.g., field blank, field duplicate), provide information regarding the sample media, sample date, sample location, sample global positioning system (GPS) coordinates, associated logbook number, and sampling team members for every sample (i.e., all samples will have a datasheet). All datasheets must be entered into electronic format. Field sample information is critical to any site database and this is where that information is derived. Perhaps it is true that not all information will be entered, but it is expected that at least some information for each sample will be entered into an electronic format.

The requirements to be included in field datasheets, as listed in comment #45 and comment #81, were added to RI/FS Work Plan Section 8.1.2 and SAP Section 6.7.2.

46) RI/FS Work Plan Section 8.1.3, page 88 - Sample identification numbers must also be included on field datasheets. Comments were made on the SAP about the sample naming nomenclature; please refer to those comments.

The sample identification numbers will be included on field datasheets as noted in RI/FS Section 8.1.3.

47) RI/FS Work Plan Section 9.7, page 91, 6th bullet – The bullet states that the RI Report will include a contaminant fate and transport evaluation. Please add a section to the RI/FS Work Plan describing the methodology that will be used to evaluate fate and transport of COPCs.

Section 5.7 was added to the RI/FS Work Plan.

48) RI/FS Work Plan, Table 1 – The longitude for well W1 – PW7 is missing. Please revise the table to include this value.

Table 1 of the RI/FS Work Plan was revised to include the longitude for well W1-PW-7.

49) RI/FS Work Plan Figure 10 - This preliminary CSM should be refined per the following:

- The CSM should distinguish between complete, incomplete, and potentially complete exposure pathways.

  The CSM provided in the RI/FS Work Plan is a preliminary CSM. It has been revised to indicate that all pathways marked with a blue dot are considered potentially complete based on current land use at or in the vicinity of the Site. The CSM will be re-evaluated and updated during preparation of the Baseline Risk Assessment Work Plan following completion of the Phase 1 Site Characterization Program to identify which pathways are complete, potentially complete, or incomplete.

- The CSM does not distinguish between current and future human receptors and potentially complete exposure pathways. Future land uses should be identified to the extent possible. The community of Columbia Falls has expressed an interest in the redevelopment of the site and the RI should identify these possible future uses (e.g. future recreational uses).

  As discussed during the technical meetings held on October 7 and 8, 2015, CFAC and Glencore has not conducted sufficient evaluations to indicate potential future uses of the Site at this time. Therefore, Sections 3.3.2 and Section 6.1 have been updated to explicitly acknowledge that the preliminary CSM is based only on current site use and land use in the vicinity of the Site, and that the updated CSM to be provided in the baseline risk assessment work plan will need to consider both current and potential future use of the Site.

- Onsite groundwater wells could be used as a drinking water source for onsite workers; therefore, this pathway should be identified as potentially complete.

  Onsite groundwater wells are not used as a drinking water source for onsite workers. Electric power to the wells is being disconnected and the wells will inoperable before the end of November 2015. Therefore, this pathway has not been identified as potentially complete.

- The CSM should include possible food chain exposures pathways for humans. Consumption of Site-impacted fish is a potentially complete exposure pathway since the river near the site is used for fishing. Is consumption of site-impacted game animals a possibility?

  The food chain exposure pathway was added to the CSM.

- Is ground water used for livestock watering or irrigation for crop or gardens? These may be additional exposure pathways.

  Groundwater onsite is not used for purposes indicated above. These additional pathways will be reevaluated during the preparation of the baseline risk assessment work plan,

considering potential future land use as well as the nature and extent of contamination identified during the Phase I Site Characterization program.

- The CSM should include possible food chain exposures pathways for ecological receptors. Consumption of site-impacted plants and prey are potentially complete exposure pathways.

  The food chain exposure pathway was added to the CSM.

- The SAP describes a soil gas survey. Is there a potential for onsite soil vapor intrusion which should be included in the CSM?

  Soil vapor has been added to the CSM.

- Inhalation is identified as a complete exposure pathway for residents of Columbia Falls. Clarify if this is inhalation that may occur during domestic use of groundwater (e.g. showering) or if this is vapor intrusion. It was not clear in the RI/FS Work Plan if volatile organic compounds (VOCs) may be Site-related contaminants of concern.

  Inhalation is considered a potentially complete exposure pathway. This is based upon the potential for volatilization of VOCs, if present groundwater, that may occur during washing/showering. Only trace concentrations of VOCs were detected in groundwater during prior investigations. The sampling proposed as part of the RI will be used to determine if VOCs are site-related contaminants of concern and to re-evaluate of this pathway.

- It may be appropriate to break soil exposure pathways into surface and subsurface soil exposures.

  The soil exposure pathway has been divided into surface and subsurface soil in the revised CSM included in the RI/FS Work Plan.

- Add permitted discharges to the Source box described as Plant Drainage System.

  Permitted discharges were added.

50) SAP Section 3, page 5: Sediment and sediment porewater should be added to the second bullet outlining the media types for which nature and extent of COPCs will be determined. Having data for these media types is useful in evaluating risks to benthic invertebrates.

Sediment and sediment porewater was added to SAP Section 3.0 as requested.

51) SAP Section 4.1, page 7 - Identify the risk-based screening levels that are to be used to identify areas for further investigation. Screening levels are identified on tables and should be referenced here. This section states that soil gas surveys will be performed and should reference Section 4.5 which provides more detail on where the soil gas surveys will be

conducted. Neither the SAP nor the RI/FS Work Plan provide adequate discussion of suspected sources of VOC contamination and what the suspected contaminants are. The RI/FS Work Plan does not develop inhalation exposure pathways associated with volatiles although historical disposal of solvents in landfills is mentioned; however, the solvents disposed of were not identified. The potential for VOC contamination should be incorporated into the CSM and Section 6.0 of the RI/FS Work Plan.

Risk-based screening levels were added to Section 6.1.2 of the RI/FS Work Plan and Section 4.1 of the SAP. Soil vapor pathway has been added to the CSM as described in RI/FS Work Plan Section 3.3.2.4 and Section 6.1.

52) SAP Section 4.1, page 8 - Identify the soil intervals to be investigated in the incremental sampling approach. There is not a Section 4.4.2 in the SAP: please provide the correct reference. Additionally, please provide the EPA reference for the incremental sampling approach methodology.

SAP Section 4.1 was updated to include the soil intervals that will be investigated with the incremental sampling approach (0 to 0.5 ft-bls and 0.5 to 2.0 ft-bls) and the appropriate section reference (4.6.2 and 4.6.3). Additionally, the EPA guidance on sampling design that was referenced for the incremental sampling (i.e., grid based, composite sampling) has been added to the reference list in Section 10.

53) SAP Section 4.2, page 8 – Please revise the 3rd bullet to state that soil gas will be sampled passively. Also, add sediment, sediment porewater, and landfill gas to the bullet list and section.

SAP Section 4.2 bullet #3 was revised. Sediment, sediment porewater and landfill gas were added to the bulleted list and section.

54) SAP Section 4.3, page 9 - The bullet list includes identification of habitat areas for further evaluation in the SLERA. Please describe how this will be performed and if appropriate specialists (e.g. biologist) will identify these areas.

As part of the pre-intrusive activities that will be conducted as part of the Phase I Site characterization activities, a detailed Site reconnaissance will include a thorough habitat and biological survey. The Survey will include both terrestrial and aquatic habitats and will allow for a detailed characterization of the environmental setting as it pertains to the SLERA. The survey will be conducted by a team of two biologists over a period of one to two weeks. It will include walking the entire Site, including visual inspection and photo-documentation of all distinct habitat areas and flora and fauna observed within these areas, recording of field notes regarding these observations. A summary of the the habitat and biological survey were added to SAP Section 4.3.

55) SAP Section 4.6.1 Source Area Soil Investigation, page 14 - This section states that soil samples from unpaved areas for laboratory analysis will be collected from the top two inches of soil,

from 0.5 to 2 feet below ground surface and from 10 to 12 feet below ground surface. These soil intervals may not be as useful for risk assessment purposes as the depth interval from 2 to 5 inches below ground surface. Also these intervals may not be sufficient for the determination of the nature and extent of contamination. Please describe how the indicated sampling depths will be useful for risk assessment and to determine the nature and extent of contamination.

As agreed upon during the technical meetings held on October 7 and 8, 2015, the proposed sampling intervals will be modified. At all boring locations, soil samples will be collected from the following intervals:

Surface interval = 0 to 0.5 ft-bls
Shallow subsurface interval = 0.5 to 2 ft-bls
Deeper subsurface interval = 10 to 12 ft-bls

A description of how the proposed sampling depths will be useful to the risk assessment process is described in Section 6.1 of the RI/FS Work Plan. Additional soil samples will also be collected five to ten feet below the water table at each deep monitoring well drilling location and analyzed for cyanide and fluoride.

56) SAP Section 4.6.1, page 15 – Please describe how x-ray diffraction (XRF) data will be used.

As agreed upon during the technical meetings held on October 7 and 8, 2015, XRF will not be used during the Phase 1 Site characterization and thus was removed from the RI/FS Work Plan and SAP.

57) SAP Section 4.6.1, page 16 - Borings must be abandoned using grout or bentonite chips in accordance with Roux SOP 10.3.

It is proposed to backfill soil borings that are not completed as monitoring wells with the cuttings that were removed from the borings. Any excess cuttings from each boring or cuttings that appear to be impacted based upon visual observation or field screening will be handled in accordance with the disposal requirements to be specified in the IDW Plan.

58) Section 4.6.2, page 16 - The incremental sampling approach is not clearly defined and does not appear to consider risk assessment needs in the decision unit grid cell sizes. Decision units for incremental sampling have not considered ecological receptors and potential home ranges for receptors with small home ranges. Please discuss whether the areas where incremental sampling will be conducted provide little habitat for ecological receptors.

The incremental sampling approach has been proposed to determine average soil concentrations in approximate 1-acre sized decision units. The approach was selected in order to provide a more representative characterization of the average COPC concentrations across a large area of the Site where there is history of operations with no defined source area. We believe the average concentrations determined by this approach will provide value during the

risk assessment, specifically in the evaluation of central tendency exposure scenarios as part of the BHHRA. We also believe these values will be useful in the eco assessment, and will be supplemented with the 16 discrete soil boring locations distributed throughout the grid area. The use of the grid data will be further discussed within the BRAWP. In general, gravelly soil substrate and knapweed are present in broad sections of the areas where incremental sampling is proposed; thereby limiting the habitat value of these areas. The habitat value of these areas and the need for any additional discrete sampling to adequately complete the SLERA will be evaluated during the Site reconnaissance phase of the SLERA.

59) SAP Section 4.6.2, page 17 – Please address why the 2 to 5 inch soil interval is not included in the soil sampling intervals. In Table 1, soil intervals are listed as 0 to 0.5 feet and 0.5 to 2 feet below ground surface. Also, please be specific about the number of soil borings that will be completed in the operational area or give an estimate.

Similarly to the adjustments made to the proposed soil samples within the source areas (Comment #55), the surface sampling interval within the operational area and background areas will be revised to include 0 to 0.5 feet below land surface. The revisions are reflected in SAP Section 4.6.2 and SAP Table 1. Approximately 16 soil borings will be completed in the operational area.

60) SAP Section 4.7, page 17 – Well screens should be shorter (e.g., 10 feet) unless there is a documented need for long screens.

SAP Section 4.7 was modified to reflect 10 foot screens at most monitoring wells beneath the water table. If it is determined based on field observations that a monitoring well should be installed to bridge the water table due to the potential presence of light non-aqueous phase liquids (LNAPL) , it will include a screen length of 15 feet, to provide approximately 5 feet above and 10 feet below the water table.

61) SAP Section 4.7, page 18 –Monitoring wells should be fitted with an exterior lockable metal cover. It is necessary only to lock the exterior cover.

SAP Section 4.7 was modified to include an exterior lockable metal cover for each monitoring well.

62) SAP Section 4.7, page 19 – Well development should proceed until the discharge water meets a field turbidity value to 10 formazin nephelometric units/nephelometric turbidity units (FNU/NTU) or less or until the field turbidity does not improve for a period of two hours during active development.

The well development procedures were modified within SAP Section 4.7 as described in comment # 62.

63) SAP Section 4.9, page 20 – Add surface water sampling locations where Cedar Creek and Cedar Creek overflow exit the site. Sediment porewater sampling should be added to this section. Also, please identify the location(s) of the seep(s).

As agreed upon during the technical meetings held on October 7 and 8, 2015, surface water and sediment sampling locations were modified to be closer to the locations where Cedar Creek and Cedar Creek overflow exit the site. All sampling locations are displayed on Figures 3 through 8 of the SAP, which include the location of the Seep on all figures when in the frame of reference. As previously discussed in comments above, sediment porewater will be evaluated in Phase II of the RI and therefore is not included in SAP Section 4.9.

64) SAP Section 4.9, page 21 - The importance of sampling in the wet season is recognized, but sampling in the dry season also has utility (provides information for seasonal fluctuation in concentrations), provides additional information on ground water-surface water interaction under dry conditions to inform actual seasonal influence, etc.). Please include sampling in the dry season in this phase of sampling.

SAP Section 4.9 was modified to indicate surface water samples will be collected on a quarterly basis for one year to evaluate seasonal variations in water quality.

65) SAP Section 4.9, page 22 - Please clarify what is meant by "Sediment samples will be collected from the same locations as surface water samples to evaluate within source areas and groundwater receptors".

SAP Section 4.9 was revised, including a clarification of the text mentioned in comment #65.

66) SAP Section 4.10, page 22 - Because so many types of samples are being collected it is recommended that sample types be defined so that database users can easily distinguish between samples that may be used in the risk assessment and those that are more useful for determination of the nature and extent of contamination. For example, sediment samples that are collected in a drain must be clearly identified.

Sample types are outlined for each sample in Table 1 of the SAP. Additionally, sample designation procedures are outlined in Section 5.2 of the SAP and each sample will include a code for sample location type and sample media type.

67) SAP Section 5.1, page 23 - Add a SOP for sampling of sediment porewater, the collection of GPS information, and the handling of IDW (in the event disposable equipment is used).

An SOP for the collection of GPS information was added in SAP Section 5.1. As described in RI/FS Work Plan Section 4.2 and Comment # 32, sediment porewater will be collected during the Phase II Site Characterization and therefore an SOP for sediment porewater will be included in the Phase II Site Characterization SAP. As described in Comment #6, a plan for disposition of IDW is currently being prepared and will be included in the final RI/FS Work Plan and SAP.

68) SAP Section 5.2, page 24 - Add "PW" (porewater) as a sample media type. Also, the sample media type seems redundant with the information in the Sampling Location Type. Please clarify what is to be gained by including this. Frequently in data analysis, samples are retrieved by sample type. Please describe how a user will be able to differentiate between these pieces of information (e.g., how will a sediment sample from a drain or creek be differentiated without separating the dataset by sample location?).

As discussed above in comment #32, porewater will not be collected during the Phase 1 Site Characterization activities and therefore porewater was not added to the list of sampling media type in Section 5.2 since this section is only referring to samples being collected during Phase 1. Porewater will be included as a sampling type in the Phase 2 SAP.

The sample location types were modified to be unique as compared to sample media type. Use of the sampling location type will provide an additional unique field in the database to provide an indicator of the type of location where the sample is being collected. For example, use of SB vs MW will allow the user to differentiate the location from being a soil boring only location to a location where a monitoring well was installed in addition to a soil boring. This format would also allow the user to differentiate between sediment from a drain and sediment from a creek; the sediment from the drain would be designated with a location type "DS" and sediment from a creek would be designated with a location type "SDP". Additionally, a map and GPS coordinates will be provided in the summary report which indicates each sampling location.

69) SAP Section 5.2, page 24, bullet 3 – Existing monitoring wells should retain their historically used identification.

SAP Section 5.2 was modified to state existing monitoring wells will retain their historically used identification during future sampling events.

70) SAP Section 5.2 Sample Designation Procedures, page 25 - It is not recommended to use "/" in creating sample designations. Special characters are often problematic when used in queries and other database functions. It is suggest that the first example be revised to be "CFSB-001-1012" or "CFSB-001-10-12". This revision reflects the comment above and the removal of "/". Furthermore, the SAP should provide the unique identifiers that will be used for trip blanks and field duplicates.

The first example sample designation in SAP Section 5.2 was revised as suggested in comment #70. Special characters will not be used in sample designations. Unique identifiers for trip blanks and field duplicates were added to SAP Section 5.2.

71) SAP Section 5.2, page 25, bullet 5 – Please specify that the depth increment should be in feet.

The depth increment was specified to be in feet as requested.

72) SAP Section 6.4, page 30 - The last paragraph needs to include all media types that will be sampled (e.g. sediment and sediment porewater).

The last paragraph in SAP Section 6.4 was modified to include all media types that will be sampled as part of Phase 1. As discussed above in comment #32, porewater will not be collected during the Phase 1 Site Characterization activities and therefore porewater was not included since this section is only referring to the Phase 1 objectives/sampling.

73) SAP Section 6.5.1, page 31 - This section needs to explicitly state that data will be used for risk assessment purposes. Please include the following statement: "It is necessary to understand the types, extent, and concentrations of the COPCs that have resulted from former Site operations for the adequate evaluation of current and future human health and ecological risks".

The statement provided in comment #73 was added to SAP Section 6.5.1.

74) SAP Section 6.5.1, page 31, 2nd paragraph – This paragraph in the section should be moved as it does not function in the definition of the problem, but mentions the RI/FS Work Plan and CSM.

The paragraph referenced in comment #74 was removed from SAP Section 6.5.1. The content is discussed throughout the RI/FS Work Plan and SAP.

75) SAP Section 6.5.2, page 32 - Decision questions/estimation questions and statements need to be added that will adequately achieve the goals of the study. See below for an example:

- Decision Question 1: Do concentrations in Site surface soil, subsurface soil, surface water, sediment porewater, sediment, and ground water exceed project screening levels?
- Statement: Determine if concentrations in Site surface soil, subsurface soil, surface water, sediment porewater, sediment, and ground water are above screening levels and should be identified as COPCs.

As a follow-up to the discussion during the technical meeting held on October 7 and 8, 2015, the USEPA provided CFAC with a memorandum (dated October 16, 2015) including proposed decision questions/estimation questions and statements. The questions and statements provided by the USEPA were incorporated into SAP Section 6.5.2 as requested.

76) SAP Section 6.5.3, page 32 -This section should provide an overview of previous data usability and identify data gaps. Reorganization of this section is recommended so that text can be presented to concisely address the decision questions and estimation questions that are yet to be developed as noted in the comment above. In addition to measured concentration data, evaluation of risks requires information on exposure parameters (e.g., exposure frequency and duration, ingestion rates) for human health risk as well as established toxicity values to quantify potential human health and ecological risks. Please add text to the section to include this information.

Section 6.5.3 has been revised to address the first half of the above comment. As specified within the RI/FS Work Plan Section 6.1, quantification of risk will not be performed until following completion of the Phase 2 Site Characterization. Therefore, the methodology and information sources that will be used to identify exposure parameter values and toxicity values to quantify potential risks will be developed and presented in the BRAWP after the completion of the Phase 1 Site Characterization

77) SAP Section 6.5.4, page 36 - Information regarding reference sampling locations should be included for each media type in the Spatial Bounds section. For example, "Reference sampling locations will be identified such that Site-related impacts are not expected to occur in the reference locations. In particular, for streams, reference locations will be identified upstream of the Site within the same stream. For terrestrial media, reference locations will be selected up-gradient of the Site in areas with similar soil characteristics (soil type, grain size, pH, etc.) and plant cover. As noted, it is expected that contaminant concentrations in surface water, sediment, and sediment porewater may also differ as a function of season. Similar to ground water, ideally, samples would be collected at multiple points throughout the year to allow for the calculation of year-round exposure estimates and provide information on the range of expected contaminant concentrations. However, if only one season can be sampled, surface water, sediment, and sediment porewater sampling activities should be conducted during the late spring, when groundwater levels are highest (maximizing the potential for the interaction of these media with ground water) and when surface run-off is expected to be greatest." The text should be revised to reflect this if only one sampling event is desired during this phase. Decision units and sampling units for each media type for Site and reference sampling should be explicitly described in this section.

Section 6.5.4 has been revised to address the above comment.

78) SAP Section 6.5.5, page 37- Because data are to be used for risk assessment purposes, it is inappropriate to delay presentation of the analytical approach relative to risk assessment until later work plans are developed. The data collected as part of this phase should be collected and analyzed such that they are appropriate for use in risk assessment. This is an objective of this investigation as detailed on page 32. The text must be revised to present the screening levels for human health and ecological risk assessment and the sources and hierarchy used to derive these screening levels. Tables 7-10 present screening levels, but it appears that the sources considered may be incomplete or may be obsolete. Consensus on sources to be used in screening should be reached and revised values presented. Specific decision/estimation problem statements should be included for each question that is yet to be developed. For example, "If the maximum analyte concentration in Site surface soil, subsurface soil, surface water, sediment porewater, sediment, and ground water exceed their respective project screening levels, then the analyte will be retained as a COPC and evaluated further in the human and ecological risk assessment, otherwise the analyte will not be retained as a COPC". Define the

detection limits that will be required to determine sample concentrations at or below the action/screening levels.

Section 6.5.5 has been revised to present the analytical approach to address each Decision Statement provided in the October 16th memorandum provided by USEPA to CFAC. The screening values in Tables 7 - 10 have been removed until the screening values from the various sources requested by USEPA has been compiled and reviewed. Following this review, the most conservative screening values will used to update the tables.

79) SAP Section 6.5.6, page 38 - This section is greatly lacking in detail and must be reorganized. The section should contain the following elements:

- Quality Assurance/Quality Control - This section should detail or refer the reader to another section in the document were the quality assurance/quality control (QA/QC) measures that will be implemented during the investigation. These measures should minimize variability, mitigate the potential for false positive and/or false negative error, and increase accuracy and defensibility of the collected data. It should contain a description of the laboratory QC samples that will be collected and analyzed, a description of the field quality assurance processes and procedures including any special training requirements for field personnel, and a description of the field quality control samples that will be collected. It is recognized that data quality indicators have been presented, care should be taken to ensure the criteria have been specified relative to the performance needs of the investigation (e.g., the necessary detection limits).

- Decision Error Limits and Uncertainty Evaluation – This section should present the tolerable limits on decision errors and/or the level of uncertainty associated with the data set being generated and/or evaluated, which are used to establish performance goals for the data collection design. Decision error limits and/or uncertainty expression (e.g., standard error, confidence interval/limit, tolerance interval/limit, prediction interval/limit), along with the methodology used to establish and evaluate those values should be presented for each decision question.

  See below for an example of this presentation:

- For Decision Question #1 (where the maximum concentration is compared to project screening levels), the null and alternative hypotheses are as follows:

  - H0: The maximum analyte concentration in Site surface soil, subsurface soil, surface water, sediment porewater, sediment, and ground water is greater than or equal to the screening level for that medium; the analyte is a COPC and retained for further evaluation in the risk assessment for that medium.

  - HA: The maximum analyte concentration in Site surface soil, subsurface soil, surface water, sediment porewater, sediment, and ground water is less than the screening level

for that medium; the analyte is not a COPC and not retained for further evaluation in the risk assessment for that medium.

A Type I error is the more severe decision error (i.e., an analyte would be dismissed as a COPC when it could be of potential risk); therefore, a small α is desirable. A Type II error has limited consequences, i.e., an analyte would simply be retained for further evaluation in the risk assessment, but it would not result in unacceptable risks if it were not a true COPC. When selecting COPCs, the probability of a Type I error should not exceed 5% (i.e., α is set equal to 0.05) and the probability of a Type II error should not exceed 20% (i.e., β is set equal to 0.2) when the true maximum concentration is within ½ of the project screening level.

Section 6.5.6 has been revised to address the above comment. As discussed the technical meeting held on October 7 and 8, 2015, the Phase 1 Site Characterization program was developed using a judgmental sampling design; one of the accepted approaches presented within the "Guidance on Choosing a Sampling Design for Environmental Data Collection" (EPA QA/G-5S). When using a judgmental design it is not feasible to quantify the decision errors as indicated above. However, language was provided to reflect the conservative nature of the approach being used, as outlined in the prior sections of the document.

80) SAP Section 6.5.7, page 42 -This section, at a minimum, must present an overview of the sampling design and provide detail if the investigation will be performed iteratively.

Section 6.5.7 has been revised to address the above comment.

81) SAP Section 6.7.2, page 45 -At a minimum, it is expected that the datasheets will document the unique sample identifier assigned, provide information on whether the sample is representative of a field sample or a field-based QC sample (e.g., field blank, field duplicate), provide information regarding the sample media, sample date, sample location, sample GPS coordinates, associated logbook number, and sampling team members for every sample (i.e., all samples will have a datasheet). It is expected that all datasheets will be entered into electronic format. Field sample information is critical to any site database and this is where that information is derived. Perhaps it is true that not all information will be entered, but it is expected that at least some information for each sample will be entered into an electronic format.

The requirements to be included in field datasheets, as listed in comment #45 and comment #81, were added to RI/FS Work Plan Section 8.1.2 and SAP Section 6.7.2.

82) SAP Section 7, page 46 - Add a photo documentation section to describe how photos will be collected and how the pertinent information will be maintained in project files. Add an SOP regarding photo documentation to Section 5.1.

Photo documentation was added to Section 7.10 of the SAP. An SOP regarding photo documentation was added to Section 5.1.

83) SAP Section 7.3.2.2, page 47, 2nd paragraph, 5th sentence - Remove "In general," from the sentence: "~~In general,~~ Samples will be shipped or transported with sufficient time to meet all analytical holding standards".

The text in SAP Section 7.3.2.2 was revised as requested in comment #83.

84) SAP Section 7.5.1.1, page 52 - The text as written provides a description of a field split, not a field duplicate. Please revise the to include the following while retaining information regarding frequency:

- A field duplicate is a field sample that is collected at the same place and time as an original field sample. However, because of potential variation in field duplicate samples (even those from similar locations, especially for media such as soil, surface water, sediment, etc.), it is not appropriate to assume that field duplicate pairs must necessarily have the same concentration values. Rather, field duplicates help to evaluate variability due to small-scale media heterogeneity, along with analytical precision.

The text in SAP Section 7.5.1.1 was revised as requested in comment #84.

85) SAP Section 7.5.1.3, page 52 - The text as written provides a description of an equipment blank, not a true field blank. The text should be revised to include the following while retaining information regarding frequency:

- A field blank is a sample of the same medium as field samples, but which does not contain any contaminant. Field blanks are normally collected for air and water samples, but not for soil or sediment. A field blank for air shall be prepared by removing the sampling cassette from the box, opening the cassette to the air in the area where the investigative samples will be taken, then closing the cassette and packaging for shipment and analysis. Field blanks for air will be collected at a rate of 1 per day that air sampling is occurring. A field blank for water shall be prepared by placing an appropriate volume of analyte-free reagent water (e.g., ASTM Type II) into a sample collection container. Field blanks for water will be collected at a rate of at least 10% (1 field blank per 10 field samples, or 1 per sample batch, whichever is greater).

The frequency of field blank collection should be one per day per media type. A separate heading for "Equipment Blanks" should be added to the text using the existing text for field blanks.

As agreed upon during the technical meeting held on October 7 and 8, 2015, field blanks will be collected for surface water only. SAP Section 7.5.1.3 was renamed equipment blanks and SAP Section 7.5.1.6 was added to discuss field blanks.

86) SAP Section 7.5.2.4, page 55 - The content from this section should be moved to Section 7.5.2.

The content from SAP Section 7.5.2.4 was moved and incorporated into SAP Section 7.5.2.

87) SAP Section 7.9, page 58 – Please add use of meteorological data to the section to evaluate the potential impacts of precipitation events.

The use of meteorological data was added to SAP Section 7.9. Meteorological data will be downloaded from NOAA for the weather station located approximately 6.5 miles southwest of the Site at Kalispell Glacier Park International Airport, Kalispell, Montana.

88) SAP Section 7.10, page 59 - Add that manual field measurements will also be recorded on field datasheets.

SAP Section 7.10 was modified as requested in comment #88.

89) SAP Section 7.10, page 61 -Ensure that the list of media types is complete in the first bullet.

The list of media types under "Project Database" in SAP Section 7.10 was revised to be complete.

90) SAP Section 8.1, page 62 - Revise the text to include internal auditing of sampling for all media types to ensure that sampling procedures are being followed for all types of sample collection.

SAP Section 8.1 was revised to include internal auditing of all media types including soil, soil gas, groundwater, surface water, and sediment.

91) SAP Table 1 – There is a column labeled AQ General Chemistry 300, but it is not clear what this includes. Is this the same as the Anion group in Tables 8 and 9?

The column labeled AQ General Chemistry was modified with additional methods and includes Fluoride via method 300.0, Alkalinity via method SM2023B, and hardness via method 200.7. As discussed in response to comment #45, nutrients were added to the analyte list for groundwater in Section 5.5.2 of the RI/FS Work Plan and Section 4.8 of the SAP. Additionally, a column was added to SAP Table 1 for nutrients.

92) SAP Table 5 – It appears that the formatting has cut off some of the entries. Please reformat such that all entries are fully readable.

The table formatting for SAP Table 5 was reviewed and it has been verified that all content in SAP Table 5 are displayed.

<u>Attachments</u>: EPA Region 8 QA Document Review Crosswalk, CFAC Phase 1 Site Characterization Sampling and Analysis Plan

The SAP was revised based on the comments and suggestions provided in the Document Review Crosswalk provided by USEPA / CDM Smith.