Record of Modification

Phase 1 Site Characterization Sampling and Analysis Plan Field Activities
Columbia Fall Aluminum Company RI/FS
Phase 1 SAP MOD #10

Instructions to Requester: **Submit to Roux RI Manager or Roux RI/FS Project Manager**
Roux RI Manager will maintain legible copies in a binder that can be accessed by personnel.

Project Work Plan/QAPP (check one)**:**

[X] 2015 Phase 1 SAP

[ ] SOP (Title, # and approval date): _____

Requester: Roux Associates Date: June 21, 2017

Applicable section of SAP/SOP:

Section 4.6 Soil Sampling, Section 5.1 SOPs, and Sections 6.5.1 thru 6.5.7 regarding Data Quality Objectives

Description of Modification:

Surface soil samples will be collected from the four asbestos landfills across the Site to determine the presence, or lack thereof, of asbestos in the surface soil. Samples will be analyzed via the California Air Resources Board (CARB) 435 method for determining asbestos content, as described in the USEPA's asbestos framework (https://semspub.epa.gov/work/HQ/175329.pdf).

Each asbestos landfill will be divided into grids, not to exceed 3,000 square feet for each grid cell. Within each grid cell, 30 soil sub-samples will be collected at the surface, between 0 feet and 0.5 feet, with a hand tool, such as a stainless-steel hang auger or trowel. The 30 soil sub-sample locations will be randomly computer generated sample points. Soil from each grid will be sent to Test America, Inc's EMLab P&K laboratory. As part of the preparation for the CARB 435 analysis, the laboratory will homogenize the 30 soil sub-samples for analysis of the grid as one composite sample. A total of 56 grids are estimated to be sampled. The proposed grid layouts in the asbestos landfills are shown in the attached map. The proposed soil sampling procedure is described in the attached "Standard Operating Procedure 5.13 for Collection of Composite Soil Samples for Laboratory Analysis of Asbestos via CARB 435". The preparation and laboratory procedures for the CARB 435 analysis is described in the attached laboratory SOP titled "Asbestos Analysis in Soils and Rock: CARB 435 using PLM".

One field duplicate sample will be collected for every 20 samples collected. Field duplicate samples will be collected as samples co-located in the same grid as the parent sample. The duplicate will be collected using the same number of subsamples as the parent sample, but from different randomly-selected subsample locations.

Rationale for Modifications / Potential Implications of Modifications:

The rationale for the modification is provided below based upon the development Data Quality Objectives (DQOs) in accordance with the seven step DQO process outlined in USEPA guidance:

Step 1: Define the Problem
Historical knowledge of operations at the Site, the existing Site Conceptual Model, and previous Site reconnaissance and test pitting, indicate that asbestos containing materials are buried in the landfills. However, it cannot be determined from visual field inspection if the historical asbestos containing material (ACM) disposal activity has impacted surface soil conditions. The surface soil sampling proposed in this modification was requested by the EPA to evaluate whether asbestos is present in surface soil.

Step 2: Identify the Goals / Decisions of Study
The goal of the sampling is to determine the presence, or lack thereof, of asbestos in the surface soil. The scope of work for this sampling effort can be considered an evaluation of Steps 1 through 3 of the EPA Asbestos framework decision process. The objectives of the surface soil sampling are presented as Step 1 and formed the basis for development of the following decision questions and statements.

- Question 1: Is asbestos present in surficial soils at concentrations above the method detection limit (MDL) for the selected analytical approach?

  Decision Statement: If asbestos is detected above the MDL using the selected analytical approach, the potential for exposure to asbestos present in the surface soils should be evaluated further in development of the Baseline Risk Assessment Work Plan (BRAWP).

- Question 2: What is the extent of asbestos in surface soils at the asbestos landfills, if any?

  Estimation Statement: The results of the sampling will be used to estimate the areal extent of asbestos contamination in surface soil in the asbestos landfills, if any.

- Question 4: Is there ACM (e.g., building materials) at land surface, other than surface soils?

  Decision Statement: If other types of ACM are present at land surface, the potential for exposure to such materials should also be considered during development of the BRAWP.

Step 3: Identify Information Inputs
Surficial soil samples will be collected for analysis by CARB 435 using PLM. If suspect waste materials are encountered at the surface, including but not limited to, building materials or piping/conduit, a representative sample of each type of material will be collected for analysis by EPA Method 600 using PLM. Analytical data collected for samples will be evaluated to determine if asbestos was detected above the MDL. Sampling activities will be performed by a team of two individuals, one of which will be a State of Montana certified asbestos inspector.

Step 4: Define the Study Boundaries
Spatial Bounds
Sample collection will occur within the boundaries of the North and South Asbestos Landfills at the Site, as presented in the attached figure. The approximate boundaries of the landfills have been previously determined based historical aerial photo review and upon field reconnaissance activities. Sampling will be limited to surface soils (0-0.5 feet below land surface) and materials present at land surface.

Temporal Bounds
The estimated duration of activities for surficial soil sampling is two weeks in July 2017. Sampling activities should not be conducted on windy days to reduce the potential for exposure to particulate matter that could potentially contain asbestos.

Step 5: Develop the Analytical Approach
The scope of work was developed to collect the types of data (i.e. identified information inputs) required to address the decision and estimation statements specified in Step 2. The results from the sampling conducted at each landfill will be evaluated to determine whether the potential for exposure to asbestos present in the surface soils should be considered further in development of the BRAWP. The action level for making this determination will be the MDL for each method. These comparisons may also be used to assist in determining if additional sampling and/or interim remedial action is required (i.e. if the analytical data is detected above the MDL).

Step 6: Specify Performance or Acceptance Criteria
Performance or acceptance criteria is addressed by the quality assurance/quality control (QA/QC) aspects of the project as well as by an assessment of potential decision error and uncertainty evaluation. QA/QC measures will be implemented throughout the course of the asbestos surface soil sampling. These measures will minimize variability, mitigate the potential for false positive and/or false negative error, and increase the accuracy and defensibility of collected data. These measures include, but are not limited to, the following:

- Ensuring that that project personnel have the proper qualifications and training;
- Establishing a process for management of project documents, data, and records;
- Requirements for testing, inspection, maintenance, and calibration of field and/or laboratory instrumentation;
- Collection and analysis of field QC samples;
- Analysis of laboratory QC samples; and
- Assessment and oversight.

The analytical results of sampling activities will be evaluated with respect to the following data quality indicators: precision, accuracy, representativeness, completeness, sensitivity, and comparability. The aforementioned data quality indicators are discussed in detail in the Phase I Site Characterization SAP. Compliance with these criteria will be evaluated by the laboratory in accordance with laboratory SOPs and quality assurance procedures, and any non-conformity identified shall be addressed in the lab reports. These criteria will also be evaluated during data verification and validation processes, consistent with the Phase I Site Characterization SAP.

Field precision is assessed through the collection and measurement of field duplicates. Field duplicate quality control samples will be collected at a frequency of one per 20 samples collected, consistent with the frequency outlined in the Phase I Site Characterization SAP. Field duplicate samples will be collected as samples co-located in the same area as the parent sample. The duplicate will be collected using the same number of subsamples as the parent sample, but from different randomly-selected subsample locations. The variability between field duplicates reflects the combined variation in concentration between nearby samples and the variation due to measurement error. Precision will be evaluated in terms of relative percent difference (RPD) between two replicate samples.

As described below, the sampling plan for the Phase I SAP was developed based upon judgmental sampling design, based upon USEPA's requested sampling approach, to provide sample coverage across each asbestos landfill area. Judgmental sampling design is one of the accepted methods described in USEPA guidance on sampling design (USEPA, 2002b). Quantitative analysis of decision error limits and

uncertainty is not feasible when implementing a judgmental sampling program. However, as described within the sampling plan, the proposed sample locations are biased to be within the landfill areas. The analytical approach calls for using any detection above the MDL within each landfill as the action level to trigger consideration of the potential for exposure to asbestos in surface soil as part of the development of the BRAWP. This approach is overall a conservative approach that should minimize the potential for a Type 1 decision error (i.e., asbestos being dismissed as a COPC in surface soil when it could be of potential risk).

Step 7: Develop the Plan for Obtaining Data

As requested by USEPA, the sampling will be conducted at the frequency of 30 surface soil sub-samples per grid cell (approximately 3,000 square ft per cell). Within each grid cell, the 30 locations will be randomly distributed. A total of 56 grid cells are estimated to be sampled across the four landfills. The coordinates of the random locations will be established using Geographic Information Systems (GIS) and a random number generator, and field personnel will utilize a hand-held GPS (with submeter accuracy) to navigate to each location for sample collection. Soil samples will be analyzed for CARB 435 using PLM. Within each landfill area, a representative sample of each different type of waste material (including, but not limited to building materials, piping/conduits, etc.) encountered at the surface other than soils, if any, will be collected separately and analyzed with EPA Method 600 using PLM.

Duration of Modification (Check one):

☐ Temporary
Date(s) _____
Sample Numbers _____

☒ Permanent (Proposed Text Modification Section) June 21, 2017
Effective Date: _____

Proposed Text Modifications in Associated Document:

This form serves to document the change as described above, no document revisions are proposed.

Data Quality Indicator (check one) – Please reference definitions on next page for direction on selecting data quality indicators:

☐ **Not Applicable** ☐ **Reject** ☐ **Low Bias** ☐ **Estimate** ☐ **High Bias** ☒ **No Bias**

Roux Project Manager Approval: Andrew Baris Date: June 21, 2017
(Roux RI/FS Project Manager or designate)

EPA Review and Approval: Mike Cirian Date: _____
(USEPA RPM or designate)

DATA QUALITY INDICATOR DEFINITIONS

Reject – Samples associated with this modification form are not useable. The conditions outlined in the modification form adversely affect the associated sample to such a degree that the data are not reliable.

Low Bias – Samples associated with this modification form are useable, but results are likely to be biased low. The conditions outlined in the modification form suggest that associated sample data are reliable, but estimated low.

Estimate – Samples associated with this modification form are useable, but results should be considered approximations. The conditions outlined in the modification form suggest that associated sample data are reliable, but estimates.

High Bias – Samples associated with this modification form are useable, but results are likely to be biased high. The conditions outlined in the modification form suggest that associated sample data are reliable, but estimated high.

No Bias – Samples associated with this modification form are useable as reported. The conditions outlined in the modification form suggest that associated sample data are reliable as reported.