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SUBJECT: COMMENTS ON THE AUGUST 2003 DRAFT SUPPLEMENTAL CHARACTERIZATION PLAN FOR THE MOLYCORP, INC., WASHINGTON, PA SITE

Docket No: 040-08778
License No: SMB-1393

Dear Mr. McLaughlin:

We appreciate your response to our request for comments on the August 2003 Draft Supplemental Site Characterization Plan for the Washington, Pennsylvania Site. As you know, in order to meet the aggressive schedule set forth in the Plan, we began field operations in mid-September. Consequently, it was necessary to finalize the investigation plan prior to that date, taking into consideration all comments that were available at that time. Nevertheless, we appreciate the observations contained in your September 22, 2003 letter and will incorporate your guidance in execution of the supplemental characterization to the extent practicable.

The final plan, which recently was transmitted to you, already incorporates some of the concepts set forth in your comment letter. Molycorp and Malcolm Pirnie have carefully considered your comments and our thoughts on each of the comments contained in your recent letter are set forth below following each specific comment.

1. *Section 1.1: This section of the document provides the general characterization project objectives. However, because of the site complexity, numerous unknown conditions, and the various types of site areas to be addressed, NRC recommends that a more formal data quality objective (DQO) section be developed for each site area that follows the guidance contained in the U.S. Environmental Protection Agency's Data Quality Objectives Process for Hazardous Waste Site Investigations; EPA/QAG-4HW, January 2000. For example, site areas may require varying degrees of characterization survey information based on expected site conditions. This same guidance has been adapted into the Multi-Agency Radiation Survey and Site Investigation Manual (MARSSIM).*

The primary objective of the characterization event is to generate sufficient data so that an integrated closure plan addressing the entire site can be developed. A large body of data already exists for the

radiologically impacted areas and a lesser quantity of data for other areas of the site. However, much of the previously collected characterization data addressed only Th-232 chain radionuclides. Moreover, downhole gamma measurements are believed not to be sufficiently quantitative to enable development of accurate volume estimates of the radiologically impacted zone. Therefore, planned characterization activities are designed to provide information on U-238 chain radionuclides, address equilibrium issues and to compliment existing characterization data (fill data gaps).

As set forth in MARSSIM, characterization surveys may be performed to satisfy a number of specific objectives including:

- determining the nature and extent of contamination
- evaluating remediation alternatives
- input to pathway analysis/dose or risk assessment
- estimating health and safety impacts during remediation
- evaluating remediation technologies
- input to final status determination design

All of these specific objectives have been incorporated in design of the supplemental characterization plan with regard to both radiological and non-radiological concerns in various areas of the site. Guidance developed by and input provided by the Pennsylvania Department of Environmental Protection in support of the state Act 2 program was followed in development of the plan to address non-radiological issues.

Although a formal DQO process (as detailed in Appendix D of MARSSIM) was not described in the plan, key elements of the DQO process were used and are contained in the final characterization plan including:

- statement of the problem
- identification of the decision
- identification of decision inputs
- definition of study boundaries
- development of a decision rule

The DQO process can be iterative and will be used as warranted throughout performance of the characterization survey. However, since the plan has been finalized and the characterization already is underway, documenting the formal DQO process in a plan revision is not contemplated.

2. *Sections 1.2.5 and 1.2.6: These sections provide information on prior investigations and remedial actions. It is unclear, for some of the areas discussed, whether or not they are within the bounds of proposed characterization activities. It would be helpful if the land areas in these sections, where applicable, were cross-referenced to the appropriate land area nomenclature (Areas 1 through 10) used in Section 1.2.2 and elsewhere throughout the document. Alternatively, the investigated or remediated areas could be referenced to, and shown on, a site map that also includes the ten characterization area demarcations.*

The land area nomenclature (Areas 1 through 10) was established to aid in development of this supplemental characterization plan. Consequently, previous investigations/remedial actions do not correspond exactly to the designated areas. Figure 2-1, Previous Sampling Locations shows most of the locations/features described in Sections 1.2.5 and 1.2.6 including the remediation area along the northern plant boundary, the tar pond areas, the former slag pile area, the former ball mill pond area, backhoe pit investigations, and borings and wells associated with previous investigations. The former RCRA ponds that were located in the western portion of Area 2 are not shown but will be mapped in the characterization report to be developed at the conclusion of the investigation.

3. Section 4.1.1, Page 4-3: *The bulletized list provides the procedure for performing gamma scans of investigated areas. NRC recommends that additional information be included regarding the method for determining the minimum, maximum, and average count rates. Furthermore, if not already planned, NRC recommends that the surveyor use the audio output to identify suspect locations of elevated activity requiring further investigation. NRC also recommends that rather than using the gamma radiation levels to reposition boring locations as discussed in the next paragraph, that any suspect locations identified during gamma walkovers be considered for judgmental sampling in addition to the proposed systematic locations discussed in later sections.*

Section 4.1.1 has been revised to incorporate use of a GPS linked gamma survey system. The approach is described in more detail in the final plan and in the appended Health Physics Manual (Appendix D). Additional detail on other sampling and measurement activities also are provided in the Health Physics Manual. Upon completion of the gamma survey, the need for additional judgmental sampling locations will be assessed in light of proposed boring locations and previous downhole gamma characterization survey results.

4. Sections 4.1.2.1, 4.1.2.2, and 4.1.2.3: *NRC recommends that the document include additional information on what process was used to determine the number of sample locations in each characterization area. Alternatively, this information could be discussed in a formalized DQO section as discussed in Comment No. 1. This comment also applies as applicable to Sections 4.2, 4.2.1, 4.3.1, 4.4.2, and 4.5.1.*

As previously discussed in the response to Comment 1 above, elements of the DQO process were used in development of the plan. In so doing, consideration was given to the large amount of data available from the 1994 Foster Wheeler Environmental Corporation study and other previous characterization events. However, the number of samples per area is critical only if the data were intended for use as a final survey to clear/release an area. Although we believe that data collected in certain portions of the site will be usable in a final survey, the primary intended use of the data is to supplement the existing body of data so that an integrated site closure plan can be developed.

5. Section 4.1.2.1, Page 4-5, 3rd Paragraph: *NRC recommends that additional information be provided regarding the decision process for core section analysis. As written, it is unclear what the intended process is for determining the depth intervals that will be analyzed. For instance, will each 1-foot section be analyzed or is the intended guidance to only analyze certain sections representing 1-foot intervals that exhibit elevated activity; or alternatively, is it intended to possibly composite and analyze the entire core? Furthermore, mixing English and metric units hinders clarity. Lastly, what is the technical basis for the intervals of interest? Again, a formal DQO presentation that outlines ultimate data use would be helpful. Site modeling applications to determine release criteria and an idea of the eventual compliance units—e.g., will compliance be based on concentrations over intervals of 15*

centimeters, one meter, or some other interval—will necessitate that this information be known prior to implementing the plan.

Each 2-foot segment of the core sample will be labeled according to depth and surveyed for gross gamma activity in units of counts per minute (cpm). The resulting gross gamma profile for the core sample will then be reviewed and one to three 2-foot segments will be selected to be analyzed for thorium and uranium activity concentrations in pico-Curies per gram (pCi/g). The decision of how many segments and which (what depth intervals) will be analyzed will be based on accomplishing the following:

- Establishing the relationship between the thorium and uranium decay chains at various locations on site and at various depths.
- Establishing the state of equilibrium between the other progeny of the uranium and thorium natural decay chains and the isotopes of radium that occur in the chains.
- Determining the extent of radiological contamination below the water table
- Determining the concentration, volume and distribution of thorium and other radionuclides

The selection procedure will be refined as quantitative analytical data become available. Core segments not sent to the laboratory for analysis will be archived in an on-site repository and will be available for future radiological analysis as deemed necessary. Additionally, samples will be returned by the laboratory upon completion of analysis and will be archived as well.

6. *Sections 4.2 through 4.8: The proposed characterization activities for the areas discussed in these sections concentrate primarily—with a few noted exceptions for Areas 4 and 6 in Sections 4.2 and 4.4, respectively—on chemical concerns. The plans for Areas 4 through 9 do not include gamma walkover surveys or radiological analyses, with the exception of radiological analysis of suspected NORM-containing refractory brick found in Area 4 and sediments from Chartiers Creek in Area 6.*

The site history provided, although extensive and well documented, does not completely eliminate the possibility that these remaining areas have been impacted by site activities. For example, there are several references to possible slag disposal in some of the areas discussed in these Sections, albeit the slag is believed to not have been from the licensed operations. As another example, Section 4.9 states that within Area 10 "There are no records of slag or processed material ever being produced or stored in either of these areas; however...thorium was identified at a concentration greater than 10 pCi/g..." Therefore, NRC recommends that both gamma walkovers of judgmental areas and random and or judgmental radiological sampling be performed.

Although this characterization plan makes no reference to nor purports to follow the guidance in MARSSIM, NRC recommends that consideration be given to incorporating some of the MARSSIM principles in designing the characterization surveys for Areas 4 through 9 to address the preceding concern. Proper planning using these principles may assist with the eventual plans and requirements to release the site. That is, Areas 4 through 9 may be considered as Class 3 areas as defined in MARSSIM and an appropriate characterization survey that satisfies both the characterization and eventual final status survey objectives should be planned. Appropriate application of the DQO process would be necessary to achieve this objective.

Although no formal discussion was included in the plan, MARSSIM principles were employed in designing the characterization plan. Various areas of the site could be assigned MARSSIM classifications as described below.

With the exception of certain sub-sections (discussed below), using MARSSIM guidance (Section 2.2) would result in classification of Areas 4, 5, 7, 8 and 9 as "non-impacted areas"

because these areas have no reasonable potential for radiological contamination from site operations.

A portion of Area 10A is known to have contained a temporary rail spur adjacent to Area 3 for ore off-loading during plant reconstruction activities in the late 1970s. Moreover, 1994 downhole gamma measurements indicated the absence of thorium contamination in the eastern portion of this area and evidence of thorium in the western portion of this area adjacent to Area 3. Therefore, if MARSSIM classifications were to be employed, based on Historical Site Assessment (HSA) and available survey data, the eastern portion of this area would be classified as Class 3 and the western portion initially as Class 1. The final characterization plan includes a 100% gamma survey of this area as well as borings, core scanning, and isotopic Th and U determinations of core samples. Likewise Area 10B is a suspect area (based on HSA) where core samples will be taken.

Some slag believed not to be associated with licensed operations was placed in portions of Areas 5 and 7B. A MARSSIM Class 3 designation would apply to these areas. The final plan calls for a gamma survey of these areas as well as core scanning for borings made in these areas.

In addition to the above, gamma survey measurements are planned during excavation of backhoe pits in Area 7A. Non-systematic gamma survey measurements will be made in other areas as ESA site reconnaissance or other activities proceed.

The glass/refractory brick locale in Area 4 (not associated with licensed activities) has been discussed in the draft and final plan.

Area 1A (excluding 1A1 and 1A2) would be classified as MARSSIM Class 3 based upon the HAS and previous survey information. Area 1A1 would merit a Class 2 designation and 1A2 Class 2 or 1. Areas 1B, 2 and 3 are MARSSIM Class 1.

General comments:

1. *Please clarify the hydraulic conductivity testing that will be performed.*

Slug tests will be performed. The procedure is described in Appendix B, Field Procedures Manual.

2. *What is the reason for not analyzing for thorium or radon in the water samples?*

Gross alpha, Radium 226, Radium 228 and U all are addressed in National Primary Drinking Water Regulations. Determinations of these constituents in water samples should adequately define the impact of licensed activities. Thorium is highly insoluble and not expected to migrate to a significant extent in groundwater. In any case, its presence would be reflected in the gross alpha measurement. Radon is not addressed in the Drinking Water Regulations and normally not measured for that purpose. Moreover, in decommissioning, radon normally is not considered separately from radium, its principal precursor.

3. *How many water sampling events will be performed?*

One.

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4. *It is not clear that radiological background levels can be determined from one shallow bedrock well and one overburden monitoring well in Area 10. Therefore, it may be more appropriate to select a gross alpha concentration, that is independent of background levels, where additional radiological analyses are performed when this value is exceeded.*

We did not intend to give the impression that radiological background levels would be determined from two wells. Several wells across the site can provide information on background gross alpha levels. In addition, data exists on gross alpha concentrations from prior investigations at the site as well as from other locations in Western Pennsylvania. This information will be considered in establishing the trigger level for performing additional radiological analyses.

5. *Although we have recommended the use of some of the principles of MARSSIM to assist in the characterization of the site, please note that your approved Decommissioning Plan requires Final Status Surveys to be conducted under the guidance contained in NUREG-5849.*

Noted.

As stated previously, we do appreciate your comments and hope you will be able to review changes that have been incorporated in the final plan. We would welcome additional input and will attempt to incorporate suggestions that reasonably can be accommodated as the work proceeds. If you would like to discuss any aspect of this response and/or the final characterization plan, we would be happy to do so. I can be reached at (505) 586-7603.

Sincerely,

Ray Cherniske
| Manager, Remediation Sites