



October 31, 2023

Transmitted Electronically

Barbara Nielsen
Cyprus Amax Minerals Company
333 N. Central Avenue
Phoenix, AZ 85004

**Re: Satra Concentrates, Steubenville
Remediation Response
Correspondence
Remedial Response
Jefferson County
441001068**

Division of Environmental Response and Revitalization

Subject: Review of IA Work Plan Amendment 10, H&H Design Memo (90%), CQA Plan (90%), Slag Testing Memo (90%), Design Drawings (90%), and Design Specifications (90%)

Dear Ms. Nielsen:

The Ohio Environmental Protection Agency (Ohio EPA) Division of Environmental Response and Revitalization (DERR) has completed a review of the following submittals for the Former Satralloy Site - *Interim Action (IA) Work Plan Amendment 10*, and the design documents for the slag consolidation project, including: *Hydrology and Hydraulics (90%)*; *Construction Quality Assurance (CQA) Plan (90%)*; *Slag Testing Memo (90%)*; *Design Drawings (90%)*; and *Design Specifications (90%)*. The documents were submitted by Cyprus Amax on September 20, 2023. The comments presented below are based upon Ohio EPA’s review of these submittals.

Comments

IA Work Plan Amendment 10

- 1) Section 2 of the work plan describes the removal basis and the proposed method for confirmation sampling in each of the 250-ft x 250-ft removal grids to ensure that each grid meets the 63 mg/Kg cleanup goal for hexavalent chromium. Cyprus Amax has proposed to analyze a composite sample from five randomly selected surface

sampling locations in each grid. If a composite sample exceeds 63 mg/Kg for hexavalent chromium, then additional removal and verification sampling will continue until hexavalent chromium in the final composite sample from each grid is below 63 mg/Kg. With this method, there appears to be no means to narrow the limits of additional removal by identifying and isolating a hot spot (if one exists). The only option, then, appears to be the removal of additional soil from the entirety of each grid, before repeating the sampling process. In addition, Ohio EPA does not generally allow composite samples to be used for confirmation of areas subject to remediation, as mechanical dilution, and loss of spatial information results from the compositing process. Ohio EPA suggests an alternative approach. Each grid could be divided initially into four equal quadrants, with the collection of a discrete surface sample from the center of each quadrant. Samples would be analyzed individually, and an arithmetic mean for hexavalent chromium would be calculated using the four sample results. If the mean is less than or equal to 63 mg/Kg and there are no signs of remaining hot spots (e.g., individual discrete sample results significantly exceeding the cleanup level), then the removal in that grid would be considered complete. If the mean is greater than 63 mg/Kg, then the individual analytical results (which might identify a hot spot) could be used to direct additional, focused removal in one or more of the quadrants.

- 2) Section 2 of the work plan states: *“Buried slag will be removed to the extent practicable. It is possible that some buried slag will not be found or will not be practicable to remove.”* Subsequent discussion indicates that these areas of slag would be covered with at least two feet of clean soil and revegetated. The term “practicable” seems to be subject to interpretation. Please provide a discussion of the scenarios for which Cyprus Amax might conclude that the removal of slag becomes “impracticable”. If Cyprus Amax anticipates this scenario in specific areas of the site, please provide an additional drawing that identifies these areas. Additionally, provide an estimate of the total area and/or volume of slag that could be considered “impracticable” to remove. Also, please note that if various areas of the site outside of the footprint of the covered stockpile will continue to contain slag (albeit covered), these areas may require future use restrictions (e.g. prohibiting excavation) that would be recorded in an environmental covenant for the property.

Drawings

- 3) Drawing 562 illustrates the details for the energy dissipators that will be built at the bottoms of the surface water downchutes. Based on Ohio EPA’s assessment of the 2017 spillway failure at the Oroville Dam in California, we offer the following recommendations: The drawing calls for the concrete reinforcement specifications

“to be decided” (TBD). One of the factors that contributed to the Oroville failure was inadequate reinforcement in the concrete spillway. Ohio EPA will need to review a thorough analysis of the final reinforcement design to assure its adequacy. Another factor in the Oroville spillway failure was inadequate drainage and the resulting hydrostatic pressure buildup under the concrete spillway structure. The design shows a weep hole for the drainage bed under the concrete dissipator, but Ohio EPA also recommends additional weep holes along the length of the downchutes to assure adequate drainage of the granular base, along with a maintenance plan to keep them flowing freely.

Hydrology and Hydraulics (H&H) Design Memorandum

- 4) Page 6 of the H&H Design Memorandum describes potential problems with surface water discharge and debris that could affect the rail line at the Gould Tunnel Eastern Portal. Cyprus Amax indicates that the “property owner to the north should be notified of these findings and potential concerns”. Ohio EPA believes that simple notification is not sufficient, and that this issue requires further discussion to ensure that any potential risk to rail infrastructure or rail traffic is eliminated or mitigated.

Design Specifications

- 5) The Earthworks (02200) component of the specifications, Sections 3.4A and B, indicate that *“clean soil will be placed in 12-inch loose lifts and compacted to a firm and unyielding condition”*. The term “firm and unyielding” is vague and should be replaced with a more prescriptive requirement, such as a minimum number of passes with a roller. Also, Section 3.4C discusses moisture conditioning to achieve compaction requirements, but neither compaction density nor moisture content have been specified, so this statement may be unnecessary.
- 6) The Revegetation (02930) component of the specifications, Section 2.2D, indicates that *“topsoil may be produced by mixing organic material such as chipped vegetation, manure, or other approved material into inorganic base soil that meets the requirements of this section.”* Ohio EPA believes that the amount of wood chips blended with other soil material should be limited, for reasons relating to both erosional stability and chemical nutrient levels. The presence of excessive green organic matter such as wood chips can significantly rob nitrogen from soil organisms and plant growth. Please revise this section to establish a limit for the percentage of chipped vegetation incorporated into manufactured topsoil.
- 7) Revegetation (02930), Section 3.3A, specifies a minimum of 3 inches of topsoil on the slag cover soil and other areas to be revegetated. Ohio EPA typically requires a minimum of 6 inches of topsoil for landfill caps and other consolidation/cover

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projects. Please revise this specification accordingly, or provide rationale/justification that 3 inches is sufficient to support healthy vegetative growth.

- 8) Revegetation (02930), Section 3.10, discusses the plans for an Enhanced Habitat Woodland, including tree planting density (600 per acre), with the timing and methods still to be determined. Please ensure that the final specifications include the appropriate protection of saplings from natural (e.g. wind) and other (e.g. deer scraping) forms of damage, to the maximum extent possible.

Please revise the appropriate sections of the design submittals to address these comments. If you have any questions, please contact me at (740) 380-5244 or kevin.ohara@epa.ohio.gov.

Sincerely,

Kevin O'Hara

Kevin O'Hara, Site Coordinator
Southeast District Office
Division of Environmental Response & Revitalization

KO/kp

cc: Kristy Hunt, DERR-SEDO
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