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October 10, 2024

Project No. 23-01-200

Alan Pineda, PE
Professional Engineer
Bureau of Industrial Site Cleanup
Nevada Division of Environmental Protection
375 E. Warm Springs Rd., Ste. 200
Las Vegas, NV 89119

Attn: Mr. Pineda

Re: **Modification No. 2 to the Remedial Design Report/Modification No. 1 to the Leaching Analysis Report, Revision 1**
Expansion of Central Valley Area
Three Kids Mine, Henderson, Nevada

Dear Mr. Pineda:

Broadbent & Associates, Inc. (Broadbent) is pleased to submit this revised modification to the *Remedial Design Report, Revision 1* and the *Leaching Analysis Report, Revision 1* for the Three Kids Mine located in Henderson, Nevada.

Please do not hesitate to contact us if you should have any questions or require additional information.

Sincerely,
BROADBENT & ASSOCIATES, INC.

Kirk Stowers, CEM
Principal Geologist

CC: JD Dotchin, NDEP
Joe McGinley, McGinley & Associates, Inc.
Caitlin Jelle, McGinley & Associates, Inc.
Ann Verwiell, ToxStrategies
Robert Unger, Lakemoor Ventures LLC
Mindy Unger-Wadkins, Lakemoor Ventures LLC
Leo Drozdoff, Drozdoff Group, LLC
Karen Gastineau, Broadbent & Associates, Inc.
Christene Klimek, City of Henderson
Sean Robertson, City of Henderson
Stephanie Garcia-Vause, City of Henderson
Anthony Molloy, City of Henderson
Quincy Edwards, Pulte Group
Doug Adair, Pulte Group
Paul Kenner, on behalf of Pulte Group
Michael Ford, Snell & Wilmer
Brad Cahoon, Dentons
Bryan Douglass, Douglass, Inc.
Charles M. Damus, Laker Development, LLC
Darryn Padfield, River Mountain Bike Shop
David Grossheim, Laker Plaza, Inc.
Frank Sator, Laker Development, LLC
Laird Sanders, Lake Mead Boat Storage
Rhonda Sanders, Lake Mead Boat Storage
Tyler Cahoon, Dentons

**Modification No. 2 to the Remedial Design Report, Revision 1/
Modification No. 1 to the Leaching Analysis Report, Revision 1
Expansion of the Central Valley Area
Three Kids Mine
Henderson, Nevada**

JURAT: I, Karen Gastineau, certify that I am responsible for the services in this document and for the preparation of this document. The services described in this document have been provided in a manner consistent with the current standards of the profession and to the best of my knowledge comply with all applicable federal, State, and local statutes, regulations, ordinances, and the requirements of the Mine Remediation and Reclamation Agreement and Administrative Order on Consent for the Three Kids Mine Site.

Karen Gastineau

**Karen Gastineau
Senior Hydrogeologist
CEM #2468 (4/1/2025)**

October 10, 2024

Date

APPENDIX A

Responses to NDEP Comments made on October 8, 2024 to the Modification No. 2 to the Remedial Design Report/Modification No. 1 to the Leaching Analysis Report, Expansion of the Central Valley Area, dated September 20, 2024

1. **Central Valley Area Expansion** – The first paragraph in this section states that “As tailings remediation progresses, the maximum depth of tailings has in some cases exceeded the 1917 topography, which was used as an estimate during planning stages of the project. More recent data from geotechnical borings also indicated potential for tailings deeper than the 1917 topography. As a result, deep fills are anticipated in areas where they were not previously, such as the majority of Tailings Pond 1, the western portion of Tailings Pond 2, and portions of the mill site.”
 - a. It is not clear why the mill site is included in this statement. The Remedial Investigation did not indicate the presence of tailings at the mill site.
 - b. The technical memorandum should also explain the reason why deep fills are anticipated in the mill site, ore yard, and other areas included in the revised Central Valley Area depicted in Figure 6.
 - c. In addition to deep fills in areas not previously anticipated, is the depth of the waste rock fill going to increase in previously planned areas? In other words, are deeper fills also anticipated in areas located within the boundary of the original Central Valley Area (e.g., tailings pond 3, waste rock areas, and western portion of drainage area north of tailings pond 2).

- a. Correct, tailings are not known to be present at the mill site. The mill site was removed from the sentence referenced, and the reason for requesting use of waste rock as fill below 10 ft in the mill site and ore yard was clarified in a separate, following sentence.
- b. See sentence added per comment 1a.
- c. The Central Valley Area model scenario presented in the Leaching Analysis Report considered waste rock used as fill up to 40 ft. The anticipated depth of waste rock fill increased as a result of recent findings. An increase in the maximum depth of waste rock fill will be covered in a separate modification that includes remodeling the Central Valley Area scenario.

2. **Applicability of Leaching Analysis** – The second paragraph states that “the model shows that it takes hundreds of years to realize any measurable amount of arsenic increase in the groundwater at a depth of 100s of feet below the bottom of the ground surface.” Please clarify what is being considered “ground surface” (e.g., native Muddy Creek Formation, waste rock, or 10-foot cover).

Ground surface is considered the top of the 10-ft cover, and this was clarified in the text.

3. **Applicability of Leaching Analysis** – The third paragraph states that “The revised waste rock expansion area would cover the former Tailings Pond 1 and western portion of Tailings Pond 2 and Closure Unit 6 areas.” It is recommended that “waste rock expansion area” be replaced with “Central Valley Area.”

“Waste rock expansion area” was replaced with “Central Valley Area” as suggested.

4. **Applicability of Leaching Analysis** – The third paragraph states that “Based on this modification, they would have 10 feet or more of waste rock fill on top of Muddy Creek Formation and below the cover – a profile similar to the 2022 Central Valley Area reclamation design.” This statement should be revised to clarify that the thickness of the waste rock fill will not be greater than the model depth of 40 feet.

This statement was clarified to state that the thickness of waste rock fill will not be greater than the model depth of 40 feet, unless considered in a future Remedial Design Report/Leaching Analysis Report modification.

5. **Applicability of Leaching Analysis** – The third paragraph states that “the concentrations are limited by arsenic sorption across the thickness of the waste rock fill layer.” However, this is not supported by the Leaching Analysis Report. The primary discussion for the Central Valley Scenario (CVS) in the Leaching Analysis Report is based on dilution from Muddy Creek, retarded flow and movement of arsenic and overall attenuation as it moves (sorption is discussed in the pits, but not the CVS). It is recommended that this statement be revised to more closely reflect the discussion in the Leaching Analysis Report.

The third paragraph was revised to more closely reflect the results presented in the Leaching Analysis Report. While the original sentence does not explicitly state that sorption is simulated, which would not be correct for the Central Valley Area simulations, it is understandable that a reader might interpret it that way in context. The added description clarifies the expected Central Valley Area scenario results for thicker and thinner waste rock layer reclamation designs and the intent of the sentence and paragraph.

TECHNICAL MEMORANDUM

To: Alan Pineda, Nevada Division of Environmental Protection

From: Karen Gastineau, Broadbent & Associates, Inc.

Subject: Modification No. 2 to the Remedial Design Report/
Modification No. 1 to the Leaching Analysis Report
Expansion of the Central Valley Area, Revision 1
Three Kids Mine Site, Henderson, Nevada

Date: October 10, 2024

This Technical Memorandum presents Broadbent & Associates, Inc.'s recommended Modification No. 2 to the *Remedial Design Report, Revision 1* dated March 4, 2024 (Remedial Design Report)/Modification No. 1 to the *Leaching Analysis Report, Revision 1* (Leaching Analysis) dated August 17, 2022 for the Three Kids Mine Site (Site) in Henderson, Nevada.

Central Valley Area Expansion

The Central Valley Area is a portion of the Site where waste rock is permitted to be used as fill below the 10-foot native soil cover to achieve final grade. As tailings remediation progresses, the maximum depth of tailings has in some cases exceeded the 1917 topography, which was used as an estimate during planning stages of the project. More recent data from geotechnical borings also indicated potential for tailings deeper than the 1917 topography. As a result, fills over 10 feet are anticipated in areas where they were not previously, such as the majority of Tailings Pond 1 and the western portion of Tailings Pond 2. Additionally, portions of the mill site and ore yard may also require fills greater than 10 feet after demolishing concrete structures and removing waste dumps. This modification expands the Central Valley Area to include the areas of the Site receiving a 10-foot cover. The attached revised Figure 6 from the Remedial Design depicts these areas in green.

There are two potential exposure pathways that need to be addressed prior to using waste rock as fill: 1) the potential for exposure to waste rock at the surface, and 2) the potential for metals to leach and impact groundwater. The potential for exposure to waste rock is alleviated through the placement of a 10-foot native soil cover. The potential for metals to leach and impact groundwater was evaluated in the Leaching Analysis. The Central Valley Area considered in the Leaching Analysis was smaller than the area depicted in the revised Figure 6, but the parameters used for the model still apply, and therefore the results apply as well. Additional details are provided below.

Applicability of Leaching Analysis

A qualitative analysis of the effect of expanding and increasing waste rock fill across the Site in the Central Valley Area beyond the original design limits was conducted to evaluate if this reclamation design modification would increase the potential risk of metals migration to groundwater. In the Central Valley leaching model it was assumed that a 12 meter (40 ft) thick layer of waste rock would be used as fill material across this reclamation unit as shown in Figure 8a of the Leaching Analysis (Broadbent 2022), as that was the maximum waste rock thickness expected. It should be noted that waste rock thickness will

vary and will be less than 40 ft in many locations. This waste rock unit is placed on top of native Muddy Creek Formation at a thickness which takes into account the eventual development elevation. A 10-foot-thick layer of native soil cover is used to cap the waste rock and complete the final ground surface for reclamation and residential reuse.

Model simulation results provided in the Leaching Analysis show that arsenic concentrations increase within unsaturated moisture in the waste rock layer but do not migrate appreciably beneath that layer over the course of the simulation (72 years in the base case scenario, Broadbent 2022, Figure 13 and Appendix H). Moreover, the model shows that it takes hundreds of years to realize any measurable amount of arsenic increase in the groundwater at a depth of 100s of feet below the bottom of the ground surface (i.e., top of 10-ft cover).

The revised Central Valley Area would cover the former Tailings Pond 1 and western portion of Tailings Pond 2 and Closure Unit 6 areas. These areas were slated for a 10-foot native soil cover directly on top of Muddy Creek Formation in the original Remedial Design. Based on this modification, they would have up to 40 feet of waste rock fill on top of Muddy Creek Formation and below the cover – a profile similar to the 2022 Central Valley Area reclamation design. (Forty feet of waste rock fill is the maximum depth unless reconsidered in a future Remedial Design Report/Leaching Analysis Report modification.) Given that the new reclamation profile will be essentially the same as the original Central Valley model, there is no expected increase in arsenic and metal migration risk over the 2022 Leaching Analysis findings.

The 2022 Leaching Analysis findings showed very low risk to waters of the state of Nevada from metal leaching of waste rock backfill. Furthermore, the expected variations in the thickness of waste rock fill would not change this assertion as the concentrations are limited by arsenic sorption and desorption equilibria across the thickness of the waste rock fill layer. The initial concentration of the solute in each modeled material in the Central Valley Area model domain is estimated based on relative Meteoric Water Mobility Procedure (MWMP) leachate concentrations. MWMP leachate concentrations are a function of solute solubility and sorption-desorption reactions. Hence, the initial concentration remains the same for each material type regardless of its thickness. This simulation does not include the sorption and desorption reactions that are simulated in the mine pit backfill scenarios, but the model does have a highly conservative amount of partitioning. The partition coefficient (K_d) is 4×10^{-7} in all materials of the model profile which results in very small amounts of attenuation. In the absence of significant partitioning, the lack of simulated mobility of solutes is a result of the very low rates of infiltration in the arid climate and not attenuation by solute sorption or other reactions. In addition, the low rate of flows predicted by model decreases dispersion and increases dilution at the boundary of the Muddy Creek Formation in the model domain. In summary, there are no expected increases in metal leaching risks associated with the proposed modification of the reclamation design for the Three Kids Mine project.

Figures

Figure 6 (Revised) Central Valley Area

References

Broadbent. 2024. *Remedial Design Report, Revision 1, Three Kids Mine, Henderson, Nevada*. March 4.

Broadbent. 2022. *Leaching Analysis Report, Revision 1, Three Kids Mine, Henderson, Nevada*. August 17.

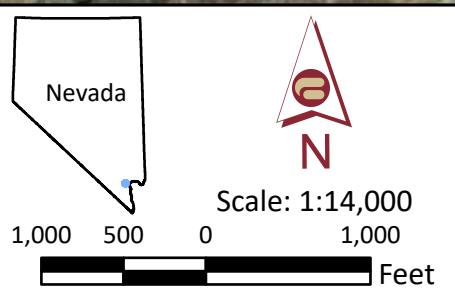
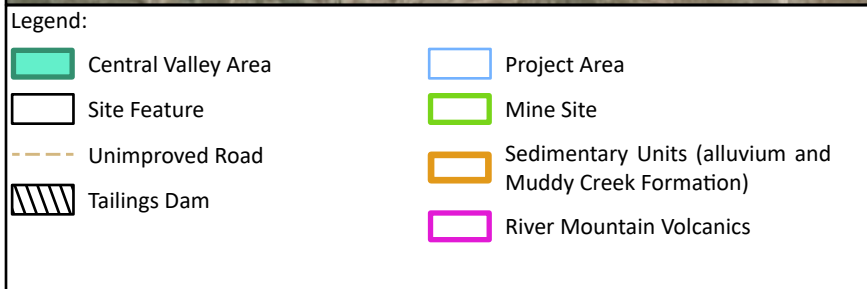
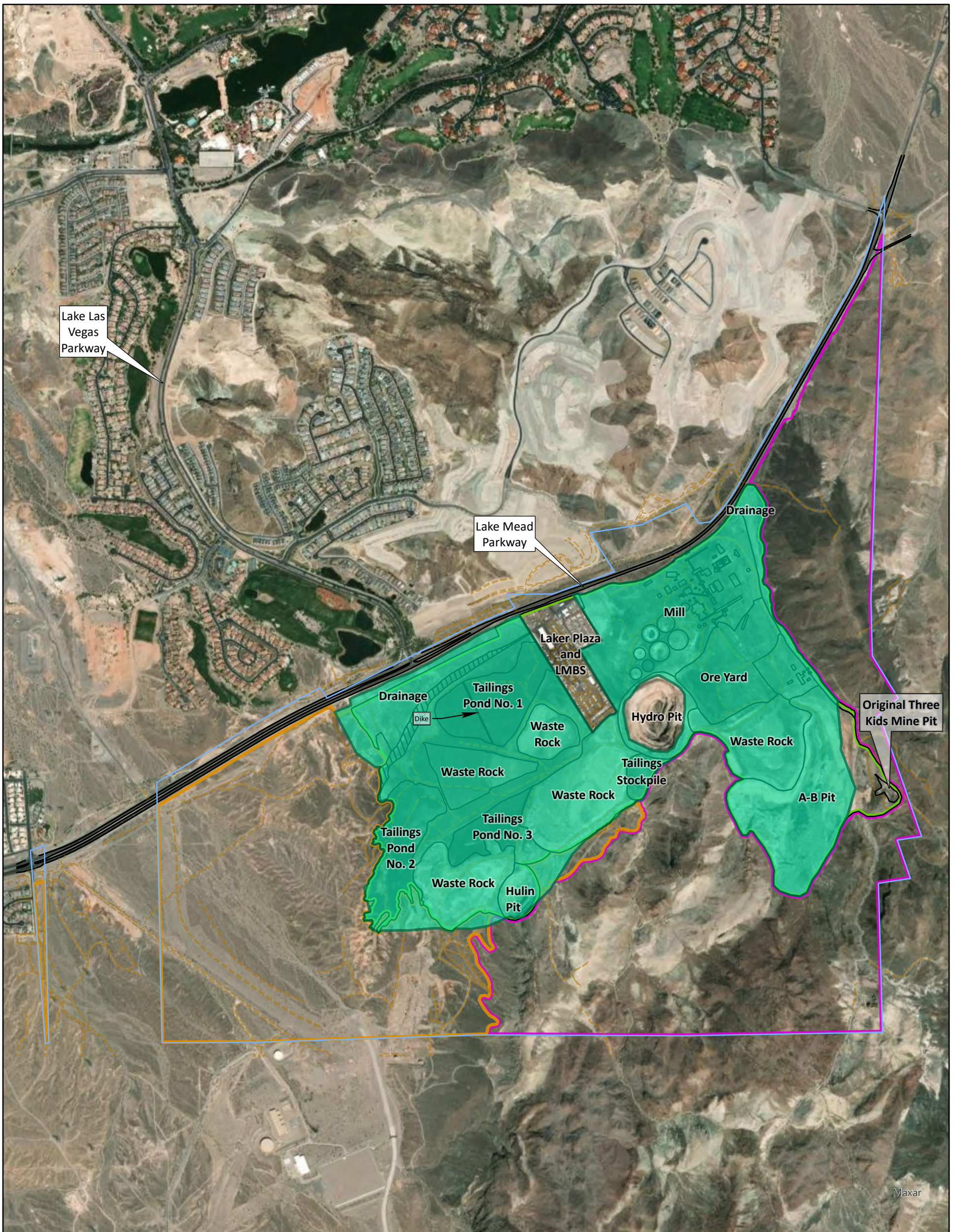


Figure 6 (Revised)

Central Valley Area

Three Kids Mine

BROADBENT

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Job # 14-01-156 Date: 9/3/2024

Notes:

1. Imagery Source: Esri World Imagery
2. Datum: NAD 1983 StatePlane Nevada East FIPS 2701 Feet
3. Not a survey. Derived from aerial imagery.

Designed	
Drawn	JCM
Approved	