Electronic Transmission

January 28, 2026

Sherry Burt-Kested
Freeport-McMoRan Chino Mines Company
P.O. Box 10
Bayard, NM 88023

RE: Comments Regarding Smelter Tailings Soils Investigation Unit Feasibility Study, Smelter Tailings Soils Investigation Unit (STSIU), Chino AOC

Dear Sherry Burt-Kested:

The Ground Water Quality Bureau (GWQB) of the New Mexico Environment Department (NMED) received the Feasibility Study on October 3, 2025, from Freeport-McMoRan Chino Mines Company (Chino). NMED has reviewed the Study and did not receive any additional comments from stakeholders. The following comments are provided for Chino's Final revision of the Study. Please make appropriate changes and edits to Appendices F and B and only re-submit those for NMED review. Corrections made to the 2 unresolved comments can be deferred until NMED review of the appendices.

NMED GWQB Comments:

Unresolved Comments remained in the 10/3/2025 Feasibility Study Report

Two comments remain unresolved following the response to comments and edits to the 2/19/2025 Feasibility Study Report.

Comment #6. There are no regression equations shown in Table 3-2 as requested in the original comment. The text states that "All IRA delineation and confirmation samples were analyzed using x-ray fluorescence (XRF) and corrected using the regression equation based on a subset of the samples analyzed by a laboratory. The regression equation and methodology were presented in the IRA Completion Reports. The Razorback Ridge and B Ranch Completion Reports did not report corrected XRF data; however, paired datasets with XRF and laboratory copper results were reported, and a regression was developed from those data for this FS and used to correct the data, which are reported in Table 3-2." The reader needs to be able to identify which samples were collected using laboratory data and which were collected using XRF then converted using regression equations. Please add a column that identifies whether the sample is laboratory analyzed or XRF data. Please also add, in a footnote, the regression equations used to convert the data from XRF to the total copper concentrations shown on the table. This should be a different footnote than the one that shows the conversions used for the 0-2" to 0-6" concentrations.

Comment #37. Please make the following adjustments to the text in Page 7.3.1.1 on Page 65. Please change the text to "The No Action alternative would not reduce predicted risks to human health and the environment, nor would it harm human health and the environment for areas with pCu between 4.6 and 4.98 (which are the areas that differ for the pCu remediation areas between Figures 8-1 and 8-2)

General Comments on the New Appendix F and Previously Provided Appendix B

Based on time, the cessation of mining operations (i.e. no additional acid deposition), and the inherent pH of the native soil there is no reason to believe that the pH increase will not be retained. However, assigning the increase solely to the white rain event seems improbable. The permanence of the increase is likely due to pedogenic processes, the continuation of atmospheric deposition of alkalinity, and the cessation of mining activities.

In some instances, such as the discussion of calcium oxide, the same theme is presented in multiple places. Not every incident is noted; however, a general statement that the comment applies in multiple places is made. It is expected that the author will address all incidence in the Feasibility Study report.

Since the new Appendix F directly pertains to the existing Appendix B of the FS, Appendix B was reviewed again considering the new data.

Appendix F Specific Comments

- P 1. States favorable soil mineralogy and ongoing natural processes; however, no description of either of these processes are presented or how they contribute to the mitigation of the acidity. This specific incidence is pointed out; however, it is stated or implied in multiple places. NMED suggests a review of pedogenic processes and revise statements.

- P 1. Suggest deleting the wording “enhanced acid neutralization potential” because it suggests that the white rain event performed like a catalyst for pH changes.

- P 1. Revise the wording “low acid generation risk”. In geologic time, soils evolve to acid generation i.e. ultisols and oxisols. The STSIU soils were adversely impacted by the smelter emissions and are inherently slightly alkaline.

- P 1. Attribution to white rain is speculative. After reviewing other comments, please revise.

- P 2. Calcium oxide (CaO), aka lime is not a natural product but rather manufactured in a lime kiln. When referred to or used as a soil amendment lime refers to calcium and alkalinity derived from limestone ($CaCO_3$). This specific incidence is pointed out; however, it is stated or implied in multiple places. Please revise.

- P 2. Calcium will mass displace hydrogen on the cation exchanger but will not increase pH. Neutralizing acidity requires alkalinity. Alkalinity takes the form of bicarbonate (HCO_3^-), carbonate (CO_3^{2-}), and hydroxide (OH^-). The species of alkalinity is understood based on pH. Suggest reviewing carbonate chemistry and revising. This specific incidence is pointed out; however, it is stated or implied in multiple places. Please revise.

- P 2. Provide rational for the decrease in total copper concentration. Consider biological, physical, and chemical reasoning for the statement.

- P 2. Rainwater at pH of 7.2 significantly higher than historical average of 4.8 – 5.3. Please expand on the 4.8 – 5.3 range, normal rainwater pH is around 5.6.

- P 3. Under Soil sampling. A field-test for the presence and qualitative level of carbonate in soil is a "fizz-test". This test requires the use of a dilute acid, typically 1M HCl and is fully described in the NRCS' Field Book for Describing and Sampling Soils (https://www.nrcs.usda.gov/resources/guides-and-instructions/field-book-for-describing-and-sampling-soils). If there is carbonate the hydrogen in HCl will generate gas (CO_2) bubbles. The more intense the bubbles the more carbonate. One caveat is that the soil particle surface area will affect the intensity of the reactivity, but bubbles will form if carbonates are present. Suggest revising field procedure to include this test.

- P 3. EPA 9045C and saturated paste are two different methods to obtain pH. Only one method should be used. NMED suggests providing an analysis on the relationship between the two methods and the implications for the results.

- Footnote #4, discussing the heterogeneity of the soils data highlights an important issue. There's no mechanism for changing the soil copper concentrations over time. Statistics intended to show temporal changes in soil copper in response to the white rain have little value and won't change the management of copper in the STSIU. NMED suggests simplifying the copper in soils analyses.

- A more detailed discussion of the lab errors noted in Footnote #5 is needed.

- P 8. Rainwater of pH 5.4 contains some bicarbonate alkalinity. Suggest reviewing carbonate chemistry and revise the statement regarding rainwater has no alkalinity.

- P 8. Provide a quantitative analysis of the buffering capacity difference in the rhyolite-derived and other andesitic basalt or Gila Conglomerate Formation soils.

- P 8. The last sentence of Section 4 states that the report demonstrates the positive effect on media, including plants and wildlife. However, the report does not present any data discussing these effects to plants and wildlife. Please clarify.

- The field notes and photos indicate oxic conditions; however, the sampling plan did not direct samplers to observe for odor or visual indications of reducing conditions. NMED suggests future sampling campaigns to include these observations.

Appendix B Specific Comments

- P 1. NMED suggests rephrasing "ion activity is toxic to plants", the ion is toxic, not the activity.

- P 2. Please clarify the use of "original" when referring to soil pH. It is assumed that the term refers to the smelter impacted soil.

- P 2. "On January 7, 2008, a white rain event deposited milky, alkaline precipitation containing suspended calcium-rich particulates (e.g., lime, calcium oxides/hydroxides) across Grant County, New Mexico, including the STSIU." Calcium was likely deposited in the form of $CaSO_4$. $CaCO_3$ may have been deposited; however, the reported pH value (7.2) does not support this. It is doubtful that lime, calcium oxides/hydroxides were deposited. This specific incidence is pointed out; however, it is stated in multiple places. Please revise.

- P 3. Regarding dissolution of calcium rich particulates increasing the buffering capacity, please revise after reviewing carbonate chemistry. As stated elsewhere it is the alkalinity that provides the buffering not the calcium.

- P 3. Please provide backup on the statement item #5.

- P 3. For item 8, suggest using a single lab-method to quantify pH, including the fizz test, and include observations regarding odor and reducing conditions for any future sampling events.

- P 13. In addition to the saturated paste and EPA9045C methods a third pH method is discussed. Please revise documentation to clarify.

- P 102. A playa is a dry lakebed containing large amounts of evaporite minerals such as alkali salts. Commonly encountered minerals include calcite, gypsum, halite, trona, and hydroxides of sodium, potassium, and magnesium. The hydroxides (NaOH, KOH, $Ca(OH)_2$ and $Mg(OH)_{2)}$ are caustic (very high pH). It is highly unlikely that these are present as evaporites. Also, alkali refers to Group 1A elements, calcium and magnesium are Group 2A. This specific incidence is pointed out; however, it is stated in multiple places. Please revise.

- P 103. To observe if a carbonate source is available from the Wilcox or Lordsburg playa a chemical analysis of the local ground and surface water should be obtained and modeled to understand the types of evaporites anticipated. This is a standard method for determining evaporites. The abstract of Naiman et al (2000) was reviewed and their work documented carbonate being a significant portion of newly forming soil carbonate; however, the abstract did not address evaporites. Please revise.

- P 105. Statements are made regarding the composition of Lordsburg and Wilcox playa samples; however, reviewing search terms for data from these locations was not found in the document. Please revise.

- P 107. Gypsum is much more soluble compared with iron or aluminum oxides. Passivation is associated with the formation of more recalcitrant minerals such as $Fe(OH_3)$. Please revise.

- P 110. Table A-1 notes. Statement regarding the sum of dissolved ions and total dissolved solids (TDS). TDS is an analysis of all components in the sample and includes waters of hydration. The

sum of ionic concentrations only considers the ions measured. The statement that the anion analysis is incomplete is not correct. Based on the pH of the sample, 6.6 there is no carbonate, only bicarbonate. The pH must exceed 8.3 for carbonate to be measurable. As noted, the charge balance, which is termed as percent difference, is excellent for all but the Gila Cliff samples. Please revise.

- Table 1. The pre and post white rain pH values are based on different soil depths. The amount of physical disturbance of the soil is unknown; however, the four-inch samples may simply have lower pH due to the depth sampled. Due to acidic conditions on the surface, calcium may have been moved from the upper portion of the soil to a lower depth. Soil sampling by depth (i.e. surface, 2", 4" …) would provide more information on this type of behavior.

- Figure 2. What are the red dots on the X axis?

- Since there is soil on the surface of the land it would be appropriate to map soil and pH changes.

- P 110. – Table A-1. The description of white rain and the pH (7.2) of the roof top sample suggests that the mineral product is gypsum ($CaSO_4$). This mineral does not provide neutralization of acidity. Please revise.

Other comments

- NMED suggests that this paper or others of similar nature be reviewed for supporting information on carbonate deposition. Reheis and Kihl, 1995 (https://doi.org/10.1029/94JD03245).

If you have any questions, please contact me at (505) 372-8545.

Sincerely, David W Mercer

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