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September 15, 2014

Ms. Germaine Chappelle
Gallagher & Kennedy
1239 Paseo de Peralta
Santa Fe, New Mexico 87501-2758

Re: Comments on Freeport-McMoRan Chino Mines Company's Draft Petition to Amend Surface Water Quality Standards (NMAC 20.6.4) and Request for Hearing

Dear Ms. Chappelle:

Thank you for the opportunity to provide comments on the above-referenced draft petition and request for hearing which was submitted to the Surface Water Quality Bureau (SWQB) in a meeting on September 3, 2014. It was during this meeting that you requested our comments on the draft petition. The proposed amendments in the draft petition would add site-specific standards for copper for certain waters in the Mimbres watershed within the Smelter/Tailing Soils Investigation Unit (STSIU) of the Chino Administrative Order on Consent (AOC) pursuant to Section D of 20.6.4.10 NMAC.

Previously, a *Revised Site-Specific Copper Toxicity Model Report* (Report) dated October 2013 was prepared by ARCADIS for Freeport-McMoRan Chino Mines Company (Chino Mines) to support the development of site-specific copper criteria that could potentially be applied to surface waters within the STSIU. The Report is also referenced in the draft petition's statement of basis and rationale.

We hope the general and specific comments prepared by staff in the SWQB and the Ground Water Quality Bureau (GWQB), and presented below, will be of assistance in the preparation of the above-referenced petition, proposed amendments and hearing request.

General Comments

The petition proposal should clearly align the applicability of the site specific copper criteria Water-Effect Ratio (WER) with the recommendations in the Report. Inferences beyond that should be sufficiently justified. For example, the formula in the petition proposal allows for bounds (or limits) at the upper ranges of site water samples for alkalinity and dissolved organic carbon (DOC); presumably the WER continues to be as protective at or above these bounds based on the linear relationship described in the Report. However, the formula is silent about lower ranges of alkalinity and DOC, specifically below those ranges sampled in the study area.

The geographic and waterbody relationships in the Report also should align with the proposal. For this reason it is critical that the segment descriptions be refined to be more descriptive such that the waters for which the WER is applicable can be explicitly identified. For example, in Section 3.2.2 Influence of Organic Carbon on Observed Copper Toxicity it is noted that ephemeral waters usually contain more organic carbon than nearby perennial streams (Westerhoff & Anning, 2000)¹. This is important as alkalinity and dissolved organic carbon (DOC) drive the mitigating WER-toxicity relationship, and the WER developed for the STSIU is recommended in the report and in the Fulton and Meyer 2014 publication² (Exhibit C) to apply *only to those types of waters (i.e., ephemeral) used for the study*. As noted in Section 4.1 of the Report, the formula or predictive model is expected “to perform very well in water chemistries that are typical of surface water at the Site”. If the intent is to apply the site specific copper criteria to *all* water bodies within the STSIU, there could be more explanation about incorporating all waters, not just those that are ephemeral streams or pools (as described in 4.2.2.3 Geographic Extent of Model Application).

The WER formula in the proposal on page 2 is not presented in the Report in the same format, so it is difficult for a reader to understand that the Report supports the formula. The petition could also reference the example derivation of a site specific WER in Table 4 of the Report.

Finally, based on the description provided it appears that the proposal would apply the WER to the critical habitat for the Chiricahua Leopard Frog (CLF), however this is not mentioned in the proposal (see Appendix F of the report). If this is correct you should consider presenting evidence to demonstrate that the proposal is sufficiently protective of this species.

Specific comments are presented below which reference sections in the draft petition.

Specific Comments

Title: The title on page 1 of the draft petition should refer to “20.6.4 NMAC” not “20.6.2 NMAC,” which is not the appropriate section of the administrative code to be amended.

Introduction, page 1: in line 3, capitalize ‘part’ (i.e., Title 20, Chapter 6, Part 4).

Proposed Amendment:

1. Based on the draft petition, it seems appropriate to include a new segment as 20.6.4.808 NMAC for the Closed Basin segment descriptions. We recommend that the proposal for a new segment follow the structure used for other classified segments – that is, first a

¹ Westerhoff, P., D. Anning. 2000. Concentrations and characteristics of organic carbon in surface water in Arizona: influence of urbanization. *Journal of Hydrology* 236: 202-222.

² Fulton, B., J. Meyer. 2014. *Environmental Toxicology and Chemistry*, Vol. 33, No. 8, pp. 1865–1873.

description of the segment waters then designated uses followed by site specific criteria. Furthermore, the water body descriptions could be refined (see following comments).

2. In accordance with the Report, Section 2 Methods, "All water samples were collected from isolated surface-water pools." Moreover, Fulton & Meyer (2014) note the impetus for the study was a limited application of a WER to ephemeral and intermittent waters. Proposed segment 20.6.4.808 NMAC implies all waters described therein would be included, and ephemeral waters are not mentioned. It is also suggested that you specify that the application of the site specific criteria is only within the boundaries of the study area known as the Smelter/Tailings Soil Investigation Unit in the December 1994 AOC, as delineated in the *Revised Site-Specific Copper Toxicity Model Report* dated October 2013, Figure 1 (Exhibit A).
3. All of the components of the formula on page 2 should be described. For example the term "100" in the numerator over the term "Hardness" is assumed to be attributed to the standard hardness of 100 mg/L CaCO₃ (as described in the Report). The term "Hardness" is assumed to be attributed to the sample hardness (as described in the Report). Also, while there are caps or upper ranges recommended for the parameters alkalinity and DOC, there is no mention of a cap for hardness. The last sentence of the paragraph under the WER formula which states, "The alkalinity, hardness and DOC concentrations used to calculate the WER value are those measured in the Site waters" is not clear. For example, no "Sites" are identified in the basin descriptions.

Section (a):

4. The descriptions in the draft petition describe a very broad overlay of the applicability of the site specific criteria. Even though some helpful geographic coordinates are provided, as written these descriptions include basically everything west of Lampbright Draw and everything east of Whitewater Creek. This approach is too vague to provide the clarity necessary for implementation of water quality standards. We recommend that whether they are named water bodies or unnamed tributaries, the specific waters to which the site-specific criteria apply be clearly defined. Also, major tributaries to a named water body should be described appropriately. For example "all tributaries that originate west of Lampbright Draw to the intersection of Lampbright Draw with Highway 180..." could include Martin Canyon and if so, it could be named in the description if proposed for application of the site specific criteria. Water bodies excluded (e.g., springs) could also be specifically mentioned in segment descriptions.
5. Due to the broad segment descriptions, it is not clear if the application of the site specific criteria in certain waters is consistent with the recommendations in the Report. The proposed petition cites Figure 1 of the Report as a reference for the segment descriptions and for applicability of the site specific criteria (Exhibit A). Other than as a very broad overlay, it is not possible to determine from Figure 1 if the segment descriptions in the petition are consistent with the water bodies represented in the Report. Therefore, a list of

waters for which the site specific criteria are proposed could be provided as an exhibit to the petition.

6. One map showing all sampling sites in waters proposed for the site specific copper criteria from both the "*Revised Site-Specific Copper Toxicity Model Report* dated October 2013" and also the hydrology protocol sites in the "*Application of the Hydrology Protocol to STSIU Drainages May 2013*" reports could be provided with the petition to aid in further review. The development of such a map may help in refining the segment descriptions. The ephemeral water bodies in which the site specific copper criteria are applicable (and are also those described in the report, "*Application of the Hydrology Protocol to STSIU Drainages May 2013*"), could be added to the segment descriptions so the WER can be applied to the acute or chronic criteria appropriately. Additionally, a reference to the appropriate site specific criteria segments could be added to the drainage descriptions proposed by the SWQB under 20.6.4.97 NMAC for ephemeral waters, once these are clearly identified.

Section (b):

In general, this section reads like a synopsis of the work plan process; it could include a sentence or two about why a site specific copper criterion that accounts for the effects of the site conditions on toxicity is more appropriate and protective for the study area. Some of this information is in section (d) and could be pulled up into section (b). More specific comments on Section (b) follow below.

7. **First paragraph, first sentence:** The Chino AOC investigation unit in question is more accurately referred to as the "Smelter/Tailing Soils Investigation Unit" or "Smelter Tailing Soils Investigation Unit."
8. **First paragraph, second sentence:** Consider adding the phrase "as the primary contaminant of concern" after the phrase "investigation identified elevated copper in soils."
9. **First paragraph, third sentence:** Suggest rewording this sentence to read:
"Surface-water sampling conducted as part of the investigation indicated exceedances of the current hardness-based aquatic life criteria standard for copper in drainages located in this area."
10. **Second paragraph, first sentence:** Suggest deleting the term "ephemeral" from the sentence, or adding "and non-ephemeral" before "surface waters" since the STSIU pre-Feasibility Remedial Action Criteria (pre-FS RAC) for risk to aquatic life apply to both ephemeral and non-ephemeral surface waters.
11. **Second paragraph, second sentence:** Consider deleting the phrase "applicable surface-water quality standards" and adding the following for greater specificity:

"...the State of New Mexico Standards for Interstate and Intrastate Surface Waters 20.6.4 NMAC for risk to aquatic life in the drainages of the Smelter Tailing Soils Investigation

Unit including all approaches and tools listed in the Code which provides options for site-specific application."

12. **Third paragraph:** This section could do more to actually explain the rationale for proposing the site-specific criteria. For example, there is already language in the *Revised Site-Specific Copper Toxicity Model Report* (October 2013) Introduction Section, page 1, second paragraph that could be used in this fashion in the petition. This material is utilized in the second paragraph of section (d) of the petition, but it still might be worth explaining some more of the rationale earlier in section (b).
13. **Third paragraph, second sentence:** The phrase "monitored by NMED" might not be the most appropriate terminology to use. Suggest using "in communication with NMED" or "...reviewed and commented on by NMED."

Section (c):

14. **First paragraph, first sentence:** Consider deleting "an approved" and adding "...a public participation process according to a Community Relations Plan."
15. **First paragraph, third sentence:** Replace the incorrect acronym "CGW" with "CWG."
16. **First paragraph, fifth sentence:** Delete the apparently misplaced term "information" occurring after "CWG."
17. **First paragraph, fifth sentence:** The Chino AOC investigation unit reference should be consistent with section (b) of the petition (see Comment 3), and is more accurately referred to as the "Smelter Tailing Soils Investigation Unit."
18. **First paragraph, sixth sentence:** Consider mentioning that the meeting was held at the Bayard Community Center.
19. **First paragraph, sixth sentence:** Replace the misspelled term "ARCAIDS" with "ARCADIS."
20. **First paragraph, sixth sentence:** Replace the term "Chino" with "the" preceding "STSIU drainages."
21. **Page 6, first bullet:** The petition might include the phrase "of record" after "local newspaper."
22. **Page 6, second bullet:** Suggest replacing the term "posted" with "included," and inserting the term "physical" before "repositories."
23. **Page 6, last sentence:** The term "recipient" should be plural.

Section (d):

- 24. Page 6, last paragraph:** Consider including more summary language justifying the derived model and proposed standard such as the best-fit multiple linear regression (MLR) model results (e.g. *Revised Site-Specific Copper Toxicity Model Report*, page 20, Discussion Section 4.1, second paragraph, last two sentences), statistical significance, R-squared values, and implementation advantages (e.g. as discussed in the *Revised Site-Specific Copper Toxicity Model Report*, page 21, Discussion Section 4.1, first bullet, and page 25, Discussion Section 4.2.2.2, first paragraph, first two sentences, and page 27, Discussion Section 4.2.2.2, last paragraph). Some of the language may be used from the *Revised Site-Specific Copper Toxicity Model Report*, Conclusion Section 5, page 29, third paragraph (of the section starting with “The proposed WER model...”) and page 30, last paragraph.
- 25. Page 7, and last paragraph, fifth sentence:** “...was modified with NMED approval...” should be deleted. The Department provided comments, but has no approval authority for the method or the report.

We appreciate the efforts by Chino Mines on the development of the draft petition proposal and hope these comments are helpful. If you have any questions about the comments or suggestions in this letter, please contact Bryan Dail at (505) 476-3799 (Bryan.Dail@state.nm.us) or me at (505) 827-2822 (Kristine.Pintado@state.nm.us).

Sincerely,



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