

DRAFT
Comments on Final Draft
Ecological Risk Assessment for the
Lava Cap Mine Superfund Site (Undated)

Comments Submitted by
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Overall, the approach toward ecological risk assessment for the Lava Cap Mine Superfund site has significant technical problems with respect to some of the so-called “toxicity thresholds.” It also appears that those doing the ecological risk assessment have a limited understanding of aquatic chemistry and how the actual chemical species present at a site will influence impacts. One of the fundamental errors with the approach occurs on page 3-5, where, in the second paragraph, a comparison is made between the concentrations in an area of concern and “background.” This approach ignores the fact that the forms of the chemical species at a particular location, such as at a background site, can be quite different from those in the areas where mine wastes have been deposited. It is entirely possible that concentrations less than background can be hazardous to aquatic or terrestrial ecosystems.

Page 3-5, second paragraph, last sentence states, “*No organic COPECs other than cyanide were identified.*” Is this because they have not been examined for? It is my understanding that there has not been a Priority Pollutant scan, or if there has been, the data have not been made available. This should be pointed out in any statement that states that something is “not present” at the site. Without indicating whether it has been searched for or not, it can be highly misleading.

Page 3-5, under section 3.3, second paragraph, the bulleted items ignore the aquatic chemistry of the system. It is not just the total concentration of a chemical and its transport, but also its chemical forms that determine whether a chemical is adverse to aquatic and terrestrial ecosystems.

Page 4-5, the next to last paragraph states, “*U.S. EPA Region X guidance for human health risk assessment recommends that arsenic resulting from mining activities be assumed to be 60 percent available through oral ingestion.*” How was this value developed? Is it based on actual studies? Are the mineral forms of arsenic at the sites where the studies were conducted the same as those at the Lava Cap Mine site? Similar situations exist with respect to the other assumed values for bioavailability that are discussed on page 4-6. There is need to evaluate the impact of this assumed value on the potential hazards that exist.

Page 6-2, under section 5.1.2 Benthic Invertebrates, first paragraph mentions, “*However, sediment guidelines have been derived for metals based on the relationship between the bulk metal concentration in the sediment, the metal concentration in the pore water, and measured biological effects.*” The so-called Long and Morgan, MacDonald and other values that are used in this study are obviously unreliable when one considers how they are developed. There is no cause and

effect. Repeated studies have shown that the Long and Morgan values or MacDonald values are often more wrong than right in predicting toxicity on an independent data set. By far the most significant problem with this ecological risk assessment is the use of any of these co-occurrence-based values, such as Long and Morgan or MacDonald, as an indication of potential impacts. They are not reliable and should not be used for any purpose.

Page 5-3, second paragraph states, “*Therefore, National Oceanic and Atmospheric Administration (NOAA) developed a procedure to derive Effects Range Low (ER-L) values (Long and Morgan, 1990), which consists of taking the 10th percentile of the distribution ...*” Again, these are unreliable values and can readily lead to both under- or overestimates of toxicity. Flipping a coin is more reliable in predicting toxicity than the Long and Morgan values. They are not NOAA values. NOAA has never endorsed these values. Long and Morgan are NOAA employees. Once, when Ed Long claimed at a meeting that they were NOAA values, NOAA management informed him that he must stop making this claim. Others in NOAA (such as O’Connor) have shown the unreliability of the Long and Morgan values for predicting sediment impacts of constituents.

Page 5-7, the first paragraph (if I understand what is done here), the authors have ignored the issue of available forms within the sediments and assumed that there is a direct relationship between the total concentrations measured and impacts. This is well-known to be fundamentally flawed.

Page 6-5, the paragraph entitled “Sediment-Mediated (Single-Chemical) Toxicity Line of Evidence” should be removed from the report. It is not reliable and is based on fundamentally flawed approaches for assessing potentially significant concentrations of constituents in sediments.

Page 6-5, the second paragraph under “Ambient Media Toxicity Line of Evidence,” again makes reference to comparisons to a reference site. This is a technically invalid approach because of the potential for constituents at the reference site and at the site of evaluation being in different chemical forms and, therefore, different availability and impacts.

Overall, while the final draft report has significant technical problems, based on the information available now, I agree with the conclusion of this report that there is limited risk of ecological impacts associated with the chemical content of the Lava Cap Mine tailings. There are, however, habitat alterations due to the physical presence of the tailings, which have affected both terrestrial and aquatic systems.

If there are questions about these comments, please contact me.

Fred