

**Longshot Mine CERCLA Removal Action**

**Longshot Mine Engineering Evaluation/Cost Analysis (EECA)**

**SUBSTANTIVE COMMENTS AND RESPONSES**

<b>Letter No.</b>	<b>Respondent</b>	<b>Comments</b>
1	Washington Dept. of Ecology	8
<b>Total Comments</b>		<b>8</b>

<b>Comment No.</b>	<b>Comment/Response</b>
1-01	<p>My understanding is that the actions being proposed are CERCLA Removal Actions, not actual final actions. Some of the comments below may be most relevant to final remedies, but I wanted to share them.</p> <p><i>The cleanup action proposed in the EE/CA (Section 1) is a Removal Action to be carried out under Forest Service Comprehensive Environmental Compliance, Liability, and Compensation Act (CERCLA) authority. Many of Ecology's comments apply to state and federal environmental requirements that are applicable or relevant and appropriate (ARAR) to the action (EE/CA Section 3.1). Removal actions strive to comply with ARARs to the extent practicable considering the urgency and scope of the cleanup effort. Even in the case of CERCLA Remedial or final actions ARARs may be waived under some circumstances. Removals are not necessarily the final cleanup action at a site; in this case the Forest Service plans to conduct three years of monitoring following completion of the removal action to determine whether further work is needed.</i></p>
1-02	<p>The drinking water assumptions used in the reports read inconsistent with MTCA [Washington State Model Toxics Control Act]. MTCA cleanup decisions are based on the hydrogeologic characteristics of an aquifer and whether that system has the potential to be a potable source of drinkable water. Thus, if a source is not being used currently, it does not change the potential that it could be a source in the future. Groundwater protection standards will apply to cleanup decisions. Selection of a cleanup approach, also likely for a removal action at a mine/mill site, should seek to ensure groundwater is protected.</p> <p><i>The Removal Action addresses highly contaminated ("hot spots") waste rock with placement underground (EE/CA Section 2.3). The Removal Action does not address groundwater, though the waste rock removal will remove a potential groundwater contamination source. The limited data available does not indicate that groundwater quality is a significant issue at the Site. No ground water monitoring wells were constructed or sampled on-Site. However, surface water from the lower adit and in the pond below the lowest tailings deposit are likely expressions of groundwater coming to the surface through seepage. The available sample data on these waters does not indicate an exceedence of MTCA groundwater or drinking water criteria (EE/CA Section 2.3 and Table 4).</i></p>
1-03	<p>The study/characterization of the tailings seems to be very limited at this site. Typically, tailings are a primary source of potential risk due to direct contact or groundwater threat. Routinely we will call for the performance of TCLP and SPLP leaching tests under most</p>

	<p>situations. Failure of either justifies further direct investigation to demonstrate groundwater has not been impacted. The outcome of such studies typically serves to drive capping design alternatives.</p> <p><i>The number of samples taken is commensurate with small volume of material sampled (Longshot Mine Site Inspection [SI], Table 2, available at the following Forest Service web site-- <a href="http://www.fs.fed.us/r6/colville/projects/cercla/">http://www.fs.fed.us/r6/colville/projects/cercla/</a>). Acid-base Accounting results of tailings and waste rock (mine waste) indicate that these carbonate-rich materials have very low potential to generate acid, which might exacerbate metals leaching (EE/CA Section 2.3, SI Table 8). The quality of water seeping into a pond immediately below the tailings deposits is comparable to apparent background water quality and suggests that ground water is not significantly affected at the Site by waste rock or tailings deposits (See Comment 1-01). Thus, while often conducted, TCLP or SPLP tests were not considered necessary at this Site.</i></p>
<p>1-04</p>	<p>The background samples collected and referenced in the studies appear quite suspect and don't appear valid for making removal action or final cleanup decisions.</p> <p><i>This comment does not provide enough information to formulate a specific response. It is not known whether the comment refers to background samples of surface water, sediment, pore water, or soil/waste rock?</i></p>
<p>1-05</p>	<p>The use of MTCA industrial soil cleanup standards at this and the vast majority of mine/mill sites are not appropriate.</p> <p><i>The Forest Service typically develops risk-based cleanup levels for our Sites. This cannot be done for lead as toxicological reference values have not been established for that element. The MTCA Industrial soil cleanup standard is listed in the EE/CA Applicable or Relevant and Appropriate Requirements (ARAR) Section as a potential ARAR. The Forest Service believes that this standard is more relevant for comparison to soil concentrations at mine sites on National Forest System (NFS) lands than a Residential standard. These sites have been clearly used for industrial purposes. And, although such sites are not zoned for industrial use as required by MTCA (173-340-200) local government entities have no authority to zone NFS land. NFS lands are also not generally available for residential use. The lower exposure represented by the Industrial standard is more representative<sup>1</sup> of recreational activities expected on NFS lands than a Residential standard, where receptors are assumed to be exposed on a daily basis over many years to the soils in question. Additionally, the Forest Service will place land restrictions in its land status records on the subject lands to insure that contaminates left on-Site will remain undisturbed or are properly managed</i></p> <p><i>For the Longshot Site two chemicals of potential concern (COPC) were identified for human receptors: arsenic and lead. The risk-based cleanup level calculated for arsenic is 52 mg/kg. This is greater than the highest concentration found in Site mine waste. A cleanup level for lead was not developed for the reason stated above. However, to assess protection of human health, the average lead concentration of the remaining mine waste before (5,371 mg/kg) and after the removal (1,278 mg/kg) is compared to the MTCA</i></p>

<sup>1</sup> Even the industrial standard is likely overly conservative for recreational uses as it assumes full-time employee exposure. For example, the EPA industrial standard assumes an exposure of 250 days per year compared to recreational user exposure assumption of 10 days per year.

	<p><i>Industrial standard (1,000 mg/kg). The average lead concentration approaches the industrial standard and, considering the conservative nature of that standard relative to recreational users (See Response 1-05) the Forest Service concludes that overall Site human health risk is significantly reduced in the Removal Action. See EE/CA Section 3.2. The remaining waste material also supports diverse vegetation which reduces the potential for incidental dermal contact and ingestion by human receptors. This vegetation would have to be destroyed if all the waste rock was removed.</i></p>
<p>1-06</p>	<p>Under MTCA, terrestrial ecological protection requirements apply to the actual contaminated areas of the “Site”. The contaminated areas are effectively assumed to be the home range. Thus, for this site the removal actions should strive to meet the state MTCA terrestrial ecological requirements as an ARAR.</p> <p><i>The Forest Service agrees that MTCA terrestrial ecological protection (TEE) requirements apply to the Site. These requirements are listed in the EE/CA Section 3.1). Due to the scope of the Removal not all Ecological Indicator Soil standards for metals (MTCA Table 749-3 or default background concentrations) will be met for waste rock left in place (See Removal Action Memorandum or RAM available at the following Forest Service web site-- <a href="http://www.fs.fed.us/r6/colville/projects/cercla/">http://www.fs.fed.us/r6/colville/projects/cercla/</a>). However, remaining mine waste material currently supports diverse vegetation (EE/CA Appendix A; SI Appendix C), represents a small total surface area (0.6 acre, SI, Table 2), and, based upon the Ecological Risk Assessment, represents little risk to wildlife except perhaps those individual terrestrial species that spend most of their existence in these limited areas (EE/CA Section.2.4.2). Moreover, due to the coarse, well-graded nature of the waste rock, burrowing receptors are unlikely to inhabit those materials.</i></p>
<p>1-07</p>	<p>The “pore water” study and results presented in the reports are very limited and could have been better linked to the protection of aquatics. Benthic sediment screening values and potentially the use of sediment bioassays are examples of additional steps to more fully judge the degree of sediment impact. Also more valid sediment background determinations would have been useful.</p> <p><i>Because the Site occupies an ephemeral drainage and on-Site wetland habitat is very limited, the primary purpose of the pore water investigation was to determine if the Site was impacting the perennial stream into which the ephemeral drainage empties (South Fork Mill Creek [SFMC]). We believe the investigation, including the background sample was adequate for that purpose. The Forest Service rarely addresses stream or pond sediment for our small-Site removals because of collateral impacts to sensitive wetland and riparian habitats that would occur.</i></p> <p><i>At the time of writing the Longshot EE/CA (2008) Ecology freshwater sediment standards were not in place. It is our understanding that, while Ecology’s marine sediment standards are final, those for fresh water are still not finalized.</i></p>
<p>1-08</p>	<p>Alternatives should further evaluate long-term protection considerations that evaluates terrestrial concerns as per MTCA and as appropriate protects against direct contact by wildlife to contaminated soil materials. If ecological concerns exist, various options can be applied to ensure protection against burrowing animal use, etc. Common examples for on-site containment that can meet eco needs may include geotextile layers, engineered permeability barriers (e.g. plastics, especially if groundwater is potentially at risk), placement of other types of wildlife avoidance material layers such as compacted non-</p>

	<p>contaminated waste rock of a certain size specifications</p> <p><i>Removal of lower-concentration (less than 1,300 mg/kg average) lead-contaminated wastes at the Site would necessitate destroying areas of robust and diverse vegetative cover, some of which is in sensitive riparian and wetland habitat. Additionally, forty percent of that area (0.25 acre) is waste rock, whose coarse, well-graded nature will discourage burrowing receptors. Ecology's suggested barrier layer options may improve protection for small burrowing animals living in the finer textured tailings (0.35 acre) but would also require destruction of the revegetated land surface and would not significantly improve the overall ecological condition of the area. However, to better meet Ecology's concerns and MTCA Terrestrial Ecological Protection requirements, the Forest Service has modified its proposed Removal Action to increase the containment of mine waste in the dry mine stope and to cap remaining mine waste left in place with clean soil where it lacks a substantial existing diverse vegetative cover (See Longshot Removal Action Memo at <a href="http://www.fs.fed.us/r6/colville/projects/cercla/">http://www.fs.fed.us/r6/colville/projects/cercla/</a>). This will further reduce direct exposure of terrestrial species to metal-bearing mine wastes.</i></p>
1-09	<p>If the Forest Service is seeking final cleanup of various mine and mill sites, other factors also come into play to meet state regulations. One example being the implementation of land covenants where contaminants are left on site (e.g., under a cover system, or secured in an underground opening, etc.).</p> <p><i>Contaminated wastes placed in the underground workings will be isolated from humans and large animals by bat-friendly closures and by a cap of clean, well graded soil that will also help shed snow melt and storm water (EE/CA Section 7.0). In addition, the Forest Service will place use restrictions on the subject lands in its land status records to insure that contaminants left on-Site will remain undisturbed or are properly managed. The use restriction is delineated on the official Forest Service land status record which is easily accessible by Forest Service employees.</i></p>