Standard Mine Technical Advisory Group
Comments on the Addendum to the Human Health Risk Assessment
For the Standard Mine Site

1. Comment: The EPA should revise Table 4-1 to show the average concentration and statistical parameters for the 2006 and 2009 soil data separately, not as a single data set. Similarly, the SMTAG requests that the upper confidence limit concentrations for the metals reported in Table 5-2 should be shown for 2006 and 2009.

Response: The data from 2009 was combined with the relevant data from 2006 which had not been disturbed during the implementation of EPA's response actions. This data set, shown in Table 4-1, represents the current exposure a person would receive while recreating on the Standard Mine Site. The 95% upper confidence limits on the arithmetic mean for this combined dataset, shown in Table 5-2, provide a conservative estimate of the average contaminant concentration and is the value used in the risk calculations. It would not be spatially representative to separate out the 2006 and 2009 datasets for the purpose of calculating exposure in this risk assessment. The differences between the 2006 and 2009 dataset are shown graphically in Figure 4-2, for those who are interested.

2. Comment: With regard to the acceptable cancer risk used for the site, the *Addendum* states "the EPA generally considers a risk level of 1x10-4 (1 in 10,000) or less to be sufficiently low and not need a response action, although this is a judgment that may vary from site to site." As submitted as written comments in previous reviews, the Standard Mine Technical Advisory Group would like the EPA to consider a lower carcinogenic risk level.

Response: EPA Region 8, in accord with national guidance, consistently uses an RME cancer risk of 1E-04 as one factor to consider in risk management decision making at Superfund sites. It should be understood that the risk estimates used in decision-making are based on a number of conservative strategies and assumptions, and that true risks are more likely to be lower. Cancer risks that fall between 1E-06 and 1E-04 require risk managers to make a determination of what level is adequately protective of human health given the characteristics of the site and the current and potential future land uses of the site. The HHRA addendum determined the Reasonable Maximum Exposure (RME) to be 2E-06, and the Central Tendency Exposure (CTE), which is a value that is reflective of an exposure potential that is more likely to occur, to be 9E-08. Given the fact that the RME is very close to EPA's lower 1E0-06 risk threshold, and the fact that the samples that were taken to calculate this value were taken prior to the site being fully revegetated, EPA risk managers believe that the risk posed by reasonably anticipated future use at the site once it is fully revegetated will be lower than the 1E-06 level and do not pose a threat to human health.

3. Comment: Even though inhalation of dust generated by ATV riding is one of the major exposure routes, the EPA still has no measured data for concentrations of metals in airborne dust (p. 15). Instead, the EPA estimates the air concentration of the metals as the product of the soil concentration and a "particulate emission factor" (PEF, p. 8). In Appendix D, the EPA explains the estimation of the PEF value – it was determined by operating two all-terrain vehicles at a smelter site in California. As stated in our critique of the *Baseline Human Health Risk Assessment*, and as acknowledged by the EPA in that document and in this *Addendum* (p. 15), the estimation of this PEF value is a major uncertainty in the risk assessment for inhalation of dust by the child all-terrain vehicle rider. The SMTAG has two objections to this process: (1) the dust at a mine site is quite likely to be different from the dust at a smelter site and would be suspended by an all-terrain vehicle differently, and (2) the data and empirical method of determining the PEF has not been peer-reviewed – the reference cited is a personal communication from B. Brass of the EPA. The SMTAG requests that measurements of airborne soil concentrations be made to reduce the uncertainty of this risk estimate.

Response: The data for ATV riders from California were used because measured data (even if at a different location) are believed to be more reliable than modeled (predicted) values. EPA does not consider it a significant issue that the data have not been peer reviewed. None of the other environmental measurements used in the calculations have been peer reviewed either. The data set used in the calculations (ATV 2) is for the second of two ATVs that rode together. This data set was used because the particulate levels for the second ATV were much higher than for the first because it was generally in the dust of the first vehicle. As noted in the response to the previous comment, the risks estimated from exposure to adults and children riding ATVs following the remediation of the waste rock/tailings and the amendment of the remaining soil/waste rock were on the very low end of EPA's acceptable risk range. EPA anticipates that these risk estimates will be further reduced once the site becomes fully revegetated and will be below EPA's levels of concern. It is unlikely that the collection of site-specific airborne dust data would alter these overall conclusions. Furthermore, no evidence, of actual ATV use at the site has been documented. EPA included this risk exposure scenario in the HHRA because it could be a likely land use scenario given the recreational nature of the site. However, in the absence of evidence of the duration and frequency of exposure for this pathway, it is difficult to quantify the magnitude of exposure. It would be even more difficult to attempt to recreate the anticipated exposure scenario in order to collect site-specific airborne dust data due to the lack of information regarding the duration and frequency of the occurance, Additionally, the site was vegetated as part of the EPA remedy and riding ATVs on the site to obtain this data would destroy the vegetation.

3. Comment: In the original *Human Health Risk Assessment* (p. 6), the EPA stated that ingestion of surface water and sediment was not expected, but could occur incidentally; however, they excepted the all-terrain vehicle riders from this exposure route without explanation. The SMTAG commented on this apparent omission in our critique of the original *Human Health Risk Assessment* (see

Comment 10 in the EPA's letter to SMTAG of January 29, 2008). The EPA response simply re-iterated that it was unlikely that an all-terrain vehicle rider would ingest surface water, but that "the risk estimates for the hiker could be used to estimate the magnitude of the risks to the ATV rider." This additional exposure route was apparently not included in the *Addendum*, and the SMTAG is insisting on its inclusion.

Response: In the March 2008 Baseline Human Health Risk Assessment for the Standard Mine Site, the risks for the ATV riders are shown in Table 4-9 and the risks from ingestion of surface water and sediment by recreational users are shown in Table 4-10. The non-cancer hazard indices for the RME adult and child ATV rider are 1.0 and 2.0, respectively. This is based on ingestion and inhalation of soil. The non-cancer hazard indices for the adult and child recreater from surface water and sediment ingestion are 0.003 and 0.01, respectively. In comparison to the ingestion and inhalation of soil, exposures via surface water and sediment are very minor. The ingestion of surface water and sediment exposure pathways were not included in the Addendum because these risk values were not expected to have changed based on the waste rock and tailings remediation efforts that EPA conducted since the original HHRA was completed in 2008.

4. Comment: In a related issue, the EPA's letter to SMTAG of January 29, 2008, the EPA stated that it would "modify the exposure scenario for recreational visitors in the drainages to include camping as well as fishing and playing along the banks." The SMTAG comment specifically questioned the omission of ingestion of surface water. It appears that the EPA did not follow up on this statement.

Response: The March 19, 2008 Baseline Human Health Risk Assessment was revised to include the camping scenario for children and adults, in addition to the recreational and fishing scenarios. For the adult camper, the non-cancer Hazard Index (HI) CTE was 0.004 and the RME was 0.02 – well below the HI risk threshold of 1. For the child camper these values were 0.005 (CTE) and 0.03 (RME), again well below the HI of 1. The excess cancer risk for the adult camper was 9E-08 (CTE) and 2E-06 (RME). The excess cancer risk for the child camper was 3E-08 (CTE) and 6E-07 (RME) – both well below EPA's lower risk threshold range of 1E-06.