

DEC's comments/recommendations on: Daniel Peplow Comments (dated 8 July 2005) on the DMTS Fugitive Dust Risk Assessment Prepared by Exponent for Teck Cominco Alaska Incorporated (dated April 2005).

No.	Comment	Priority	Recommendation
Peplow-1	The assertion that human health and environmental risks are not elevated does not consider the limitations of chemical assessment methods. The RA should more effectively utilize appropriate biological indicators in conjunction with chemical assessment.	Medium	Please update the uncertainty section.
	Potential Pathways		
Peplow-2	There still exists potential pathways for people to come into contact with metals transported by fugitive dust, either directly or indirectly. These are pathways by which ecological receptors may be exposed to metals associated with the DMTS, including pathways of exposure for both terrestrial and aquatic communities in the vicinity of the DMTS road and port facility.	Medium	Please provide additional explanation for selection of pathways and designation of "secondary" pathways.
Peplow-3	Evidence supporting the designation of exposure routes as secondary or incomplete were not included in the RA and therefore not available for review.		
Peplow-4	In the ecological RA, (Section 6), an assessment was conducted to evaluate risk to ecological receptors inhabiting terrestrial, freshwater stream, pond, and coastal lagoon habitats. Since fish are an important food source for residents in the vicinity of the DMTS, and species that are harvested for subsistence use were selected as ecological receptors, the "Stream – Deposition – Sediment – Ingestion/Uptake – Fish" exposure pathway was selected for review. Like the secondary pathways in the human health risk assessment, this pathway was designated arbitrarily as secondary in that it was not considered to contribute significantly to risk estimates.		
Peplow-5	Potentially significant pathways and risks to receptors, human and environmental, could also be missed because the designation of exposure pathways as secondary or incomplete were not based on adequate evidence that was included in the RA and available for review.		
	Mercury		
Peplow-6	Hg background levels must be measured, and Hg in the study site must be removed from the CoPCs based on empirical data. In areas remote from anthropogenic impacts, atmospheric levels of Hg are 2-4 ng m-3. In urban areas, background mercury levels are about 10 ng m-3. According to the WHO (2000) the LOAEL (lowest-observed-adverse-effect-level) might be around 15-30 ng m-3. Sampling Hg in ambient air around the DMTS would provide data about Hg vapor exposure levels to the surrounding population and better indicate whether the "Terrestrial – Adsorption – Soil – Inhalation – Receptor" exposure route should be designated at primary or secondary. Sampling can be conducted using Hg vapor analyzers, also know as Hg sniffers (e.g., LUMEX).	Low	Please provide an explanation of how mercury is addressed.

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Peplow-7	The list of CoPCs, however, could be incomplete because some metals (e.g., Hg) were eliminated as CoPCs based on an incomplete consideration of current literature regarding pathways and toxicity.		
Peplow-8	Chemical assessment methods were used in the DMTS RA to measure the concentration of contaminants. These concentrations were evaluated in relation to fixed criteria in order to calculate risk and predict biological toxicity. Although criteria are used to describe the possible cause of environmental problems, results that meet criteria provide no assurance that toxicity is not occurring due to unexpected mixtures or interactions	Low	Please discuss in uncertainty section.
Peplow-9	<p>Drift sampling methods are not, however, quantitative and do not result in data that can be compared between sites. Instead, a fine-meshed Surber sampler, Hess sampler or even a D-Net Kick Sampler, should be used. Data analysis of quantitative benthic analyses would permit a more detailed analysis of community structure.</p> <p>Furthermore, care must be taken to collect samples from riffles with similar hydrological and biogeophysical characteristics because the community structure of benthic macroinvertebrates varies widely with chemical, physical, and environmental such as streamflow, dissolved oxygen, alkalinity, mean substrate particle size, sediment and water pH, and water temperature. These potentially confounding factors were not controlled for in the RA report. Biotic indices depend on the collection of extensive physical and chemical data for each geographic location where they are to be applied. Karr's benthic index of biotic integrity and the Hilsenhoff Biotic Index are two examples. The index of Community Sensitivity addresses the impacts from metal pollution specifically but it requires that the dominant taxa within a region be ranked from most sensitive to least sensitive for one metal, and it then assumes that the ranking for another metal will be similar.</p> <p>In most benthic communities, there are typically a few genera represented by large numbers of individuals, smaller numbers of several genera, and many genera that are represented by a few individuals. In benthic communities impacted by metal contamination, metal-intolerant taxa are replaced by metal-tolerant taxa. The Montana Department of Environmental Quality has modified the Hilsenhoff Biotic Index to include tolerance values of benthic macroinvertebrates to metals. The Montana DEQ Biotic Index is the sum of the proportional abundance of a taxon in the sample times the tolerance values specified for all taxa in the sample. Values ranged from 0 (intolerant) to 10 (tolerant).</p>	Low	<p>Please provide the rationale for the sampling methods selected with respect to the use of sampling results. If possible, similar studies from the peer-reviewed literature should be cited. The pros and cons of drift net sampling versus other collection methods for benthos should be described to address this comment.</p> <p>Please evaluate the usefulness of the biotic indices discussed in this comment; in particular the modified Hilsenhoff index for metals-contaminated systems from Montana DEQ. Can they add value to the benthic-community assessment for this site? If so, present the additional data analysis in the revised ERA.</p>

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Peplow-10	Standard methods to predict mineral speciation, the solubility of oxidized metals, and solubility products using Eh-pH stability diagrams were not used. Similarly, sequential extraction techniques to characterize the relative concentrations of the different forms of the metal compounds and the potential bioavailability were not used.	Medium	Please further discuss metals speciation and bioavailability in the ERA. Indicate why the specific tools mentioned in this comment were not used.
Peplow-11	Specific baseline studies during the Baseline Study should reference the numerous studies conducted prior to implementation of the TeckCominco project, such as the one performed by Houghton and Hilgert (1983). These studies should be used as reference for the Environmental Assessment phase.	Low	Please evaluate the cited study and use it as appropriate when designing future monitoring studies at the site.

Key:

DEC = Department of Environmental Conservation (Alaska)
 DEQ = Department of Environmental Quality
 DMTS = DeLong Mountain Regional Transportation System
 RA = Risk Assessment
 TC = Teck Cominco
 WHO = World Health Organization

Notes:

1. Comments submitted by Daniel Peplow, Ph.D. 841 42nd Ave. NE, Seattle, WA 98105 USA
2. See the original Peplow comment letter for complete citations of cited literature.