

Jacques Whitford has reviewed the remediation reports for the above-noted site in order to provide a professional opinion on whether the objectives of the Closure Plan have been achieved (specifically, are current metal and petroleum hydrocarbon (PHC) concentrations in soil below levels at which adverse effects to human or ecological health might be expected?). Current soil quality was compared to site-specific soil quality remediation objectives (SQRO) for metals, and to the Canada Wide Standards for Petroleum Hydrocarbons (PHC CWS). After four seasons of remedial activities, 12 out of a total of 525 individual soil samples taken for confirmation purposes have metal or PHC concentrations (particularly the F2 and F3 fractions) higher than the site-specific SQRO or PHC CWS guidelines. This conformance level demonstrates that the remedial activities have been overwhelmingly successful, although as might be expected on a clean-up effort of this size and complexity, a small percentage of samples, representing isolated and small remnants of the material that was recovered, remain above the target levels.

Concentrations of PHC in several soil samples were greater than the most restrictive PHC CWS guidelines, however, all were below the PHC CWS for human health via soil ingestion. Other pathways, such as indoor inhalation of vapours and groundwater ingestion, for which the PHC CWS guidelines are most restrictive, do not apply at Nanisivik. The PHC CWS for ecological receptors are based on the protection of plants and invertebrates. Vegetation in the areas where the soil samples were collected is naturally very sparse (*i.e.*, polar desert), and as such current PHC concentrations do not limit plant growth. The sparse vegetation in these areas means that there is negligible foraging opportunity for higher trophic receptors (*e.g.*, small mammals, birds). As a result, no unacceptable exposures of humans or ecological receptors to PHC are expected.

Some soil samples collected from the general mine area (including the former townsite) have cadmium, lead, and/or zinc concentrations above the SQRO. The SQRO for metals in the general mine area were based on protecting a toddler who could frequent the site 60 days per year, ingest 80 mg of soil from the site each day, and obtain 20% of total dietary game from animals that were exposed to the same concentration in soil. Ingestion of wild game from the site represented the highest contribution to the human health risks (see Figures 9 to 11 in the HHERA, JW, 2003). Given the isolated distribution and very limited area of soils where metals concentrations remain above the SQRO, in comparison with the much larger area of the overall site, where metals concentrations are below the SQRO, game in the area would not have an overall exposure to metals greater than the SQRO. Similarly, people using the area are unlikely to have overall exposures to metals that are higher than the SQROs. Based on these results, no unacceptable exposures to human receptors are expected. With the exception of some samples collected along the roadway, and five samples collected near the south end of the former industrial complex, metal concentrations in soil samples were below levels likely to harm ecological receptors (see Table 7.12 in HHERA report, JW, 2003). No unacceptable exposures to ecological receptors are expected.

The remediation program at the Nanisivik Mine has substantially reduced overall exposure of human and ecological receptors to metals and PHC. The current site conditions will not result in unacceptable exposure of human or ecological receptors to metals or PHC.