



Extent and bioavailability of trace metal contamination due to acid rock drainage in Pennask Creek, British Columbia, Canada

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Pennask Creek is one of the most important rainbow trout producing streams in British Columbia (BC). Much of the Pennask Creek watershed is located within a BC Parks Protected Area, which was set aside to protect the spawning and rearing habitat of this wild rainbow trout population. Construction of Highway 97C, which bisects the Pennask Creek watershed, resulted in the exposure of a highly pyritic rock formation, which began releasing acid rock drainage and causing metals to be leached into Highway Creek, a tributary of Pennask Creek. Previous studies commissioned by the BC Ministry of Transportation and Infrastructure indicate that Highway Creek yields fewer invertebrates and elevated levels of some metals in the water when compared with downstream sites in Pennask Creek. This study examines the impacts of this acid rock drainage and metal leaching by determining the extent of trace metal contamination in the water and sediments of the Pennask Creek watershed and determining the bioavailability of these trace metals. Preliminary results indicate concentrations of Al, Cu, and Zn in the water as well as levels of total As, Cu, Fe, Ni, and Zn in the sediments that are above the BC Water and Sediment Quality Guidelines for the Protection of Aquatic Life. The highest level of trace metal contamination is found in Highway Creek, downstream of Highway 97C, with concentrations generally returning to near background levels downstream of the confluence with Pennask Creek. Levels of Cu in the water and Zn in the sediments appear to be of greatest concern in areas furthest from the highway.