

Numerical Simulation of Transport of Mine Tailings in the Watershed of Utah Lake, Utah

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Abstract. Ferreira (2013) documented elevated concentrations of As and heavy metals in the Provo and American Fork Rivers, which flow westward across the Wasatch Range and heavily-populated Utah Valley to drain into Utah Lake in Utah. While fluvial concentrations of As were moderately elevated in the Wasatch Range (0.011-0.095 mg/L), they were extremely elevated in Utah Valley (0.048-0.436 mg/L). By contrast, the EPA MCL (maximum contaminant level) for drinking water is As = 0.010 mg/L, while the CMC (chronic maximum criterion) for aquatic life in freshwater is As = 0.150 mg/L. The tentative conclusion of that study was that the rivers in Utah Valley are still impacted by the effects of historic mining and that most of the mine tailings have now accumulated near the mouths of Provo and American Fork Canyons. The objective of this study is to use numerical simulation to determine whether transport of mine tailings from the upper Provo and American Fork River watersheds to the canyon mouths is realistic over the time period between historic mining and the construction of Deer Creek and Jordanelle Dams on Provo River and Tibble Fork Dam on American Fork River. The numerical simulation will involve (1) reconstruction of the pre-dam longitudinal profiles of the rivers (2) use of empirical relations for sediment transport. Results will be reported at the meeting.