

Surface Water Quality Studies and Effects Assessment in Mining: Methods and Applications

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Impacts on surface water quality in mining projects are one of the most challenging environmental issues. Effects of water releases from tailings facilities, changes in water quality in downstream river reaches and lakes, as well as effects during mine operations and closure including end-pit lake water quality evaluation are among the most important tasks to be addressed in any environmental impact assessment for mining. Surface water quality effects studies use information from groundwater studies and geochemistry as an input to their evaluation models and assessment tools.

The presentation will give an outline of the tasks dealing with surface water quality studies from baseline data collection programs that address surface water quality modeling input requirements to approaches and appropriate models.

A set of simple but effective and transparent mass balance modeling applications developed for assessment of surface water quality during operations and closure. A hydraulic criteria model developed for assessment of potential overturn effects on water quality in end-pit lakes. The model uses hydrodynamic criteria for water mass stratification and stability and allows to assess potential to lake overturn during different stratification, climate and weather conditions.

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Sergei Touchinski is a hydrologist and environmental scientist with 30 years of experience in surface water hydrology and water quality, limnology, including pollutant transport and dispersion assessments, watershed management and water supply optimization, environmental monitoring and impact assessment. He is a recognized specialist in physical limnology and particularly in large scale lake turbulence and holds Ph.D. degree in this technical area. He provided significant contribution to the principles of spatio-temporal analysis of water quality and was conferred the DSc degree in recognition of his original contributions to the understanding and solution of significant problems in limnology and applied water quality issues.

Dr. Touchinski obtained his experience in Russia, Estonia and later in Canada being involved during last ten years in a numerous of environmental assessments in AB, BC, and NT including mining. He recently lead water quality assessments and reclamation plans including end-pit lake water quality modeling and analysis, aggregate and limestone quarries impact assessments, oil sands mining activities.