



Application of Hydrogeology in LRT Transportation Projects

Sheila Duchek
SNC-Lavalin Inc., Calgary, Alberta, Canada

ABSTRACT

Public transportation projects generate newsworthy headlines, because of multi-billion dollar public works budgets and public desire for eco-friendly transportation. Public interest is particularly relevant in Alberta with Calgary's proposed Green Line Project to get underway this year. SNC-Lavalin, one of Canada's largest engineering firms, has designed and overseen construction of a number of light transit railway (LRT) systems in several cities across Canada. Executing an LRT project requires expertise from a wide range of technical fields and the discipline of hydrogeology is critical throughout: within the bidding process, during designing and planning and throughout the execution and construction. Hydrogeologists work in many multi-disciplinary teams during the entire project.

Hydrogeologists are called upon as soon as an LRT project is initiated to provide guidance regarding dewatering for construction and to assess routes for pre-existing contamination of groundwater along the proposed line. Numerical models of groundwater flow predict design methods and layouts, well depths and pumping rates for dewatering. The risk of settling in nearby soils from dewatering activities must be assessed and well understood. Hydrogeologists oversee water quality testing of the discharge water and assist with securing necessary permits from local municipalities to provincial and federal level approval depending on where the discharge water is diverted to. Remediation may be required depending on the degree of impacts found along the proposed line.

Hydrogeologists then oversee the implementation of the dewatering network by directing dewatering well drilling and completions and preliminary aquifer testing to provide certainty to the predictive models. During construction, discharge water quality and flow rates are carefully monitored and adjustments to the network are made through careful technical analysis done in real time.

This talk will provide insight to a variety of hydrogeology applications necessary for a successful LRT project that many practitioners in hydrogeology rarely have exposure to.