

# NovaTox

## Human Health and Ecological Risk Assessment, Grand Falls Armoury, Grand Falls-Windsor, NL

### Client

Defence Construction  
Canada

### Location

Grand Falls-Windsor,  
Newfoundland & Labrador

**Date Completed**  
2009

NovaTox staff conducted a Human Health Preliminary Quantitative Risk Assessment (PQRA) and a screening level quantitative ERA at a DND-owned property in Grand Falls-Windsor, NL. Two distinct properties were assessed: the Grand Falls Armoury, which is owned by DND and primarily used for Army Reserve and cadet training; and the Woodland Primary School located on the adjoining property to the north of the Armoury. Soil and groundwater at the Armoury property had concentrations of metals and petroleum hydrocarbons that exceeded CCME and Ontario MOE guidelines as a result of historic contamination. The PQRA/ERA was requested in conjunction with a detailed testing program in support of the development of a remediation/risk management strategy.



Given the different land use at each of the properties, two distinct PQRAs were conducted to appropriately address any potential risks to human receptors (cadets, DND workers, construction workers, students, and school staff) from chemicals in both soil and groundwater. Direct contact pathways such as dermal contact and ingestion were examined in the PQRA, as well as the potential for the inhalation of vapours from petroleum hydrocarbons. Vapour scenarios were assessed for indoor air and in construction trenches from volatile compounds. The results of the HHRA concluded there were no unacceptable risks to any human receptors at the site.



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The ERA employed a quotient approach to quantify risks from elevated concentrations of metals, PHC, and propylene glycol in soil and groundwater to typical urban terrestrial receptors, including terrestrial plants, soil invertebrates, small mammals, and birds. Exposure pathways assessed included root uptake, ingestion of soil, and ingestion of food items. The ERA determined that metals in soil posed some risk to plants and soil invertebrates, but adverse impacts were likely limited to areas with the highest metal concentrations.

The PQRA/ERA was submitted to Health Canada and Environment Canada for review, with only minimal comments received. With respect to the HHRA, the Health Canada reviewer noted: *"This was the best written and most complete Human Health Risk Assessment I have reviewed in the Atlantic region."*