

Hydrogeology, Groundwater and Environmental Site Assessment



Morrison Hershfield's hydrogeologists conduct extensive hydrogeological and groundwater studies and environmental site assessments for a diverse range of clients for projects in the domestic, commercial and industrial sectors. These studies include:

- **Phase I and II Environmental Site Assessments (ESAs)**
- **Soil and Groundwater Sampling and Testing for Chemicals and Hazardous Material Contamination**
- **Delineation Studies for Petroleum Hydrocarbons and Chlorinated Solvents Spills**
- **Contaminated Site Investigations**
- **Contaminant Transport Assessment**
- **Groundwater Flow and Transport Modeling**
- **Human and Ecological Risk Assessments**
- **Records of Site Condition**
- **Design of Groundwater and Soil Remediation Plans**
- **Design and Implementation of Groundwater Monitoring Programs**
- **Groundwater Management**
- **Pumping Tests**
- **Hydrogeological Investigations and Groundwater Impact Assessments**
- **Permit To Take Water (PTTW) Studies and Applications to the Ministry of the Environment (MOE)**



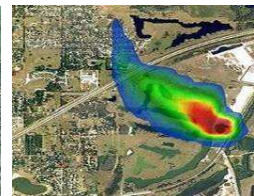
Phase I and II
Environmental Site
Assessments



Groundwater and Soil
Sampling



Delineation of
Petroleum
Hydrocarbon Spills



Groundwater Flow and
Transport Modeling



Groundwater and Soil
Remediation
Programs





Groundwater and Soil Remediation for Industrial Lagoon

We undertook a full peer review of the design and remediation plan for this 14 plus hectare industrial lagoon which contained massive amounts of highly contaminated pulp and paper sludge. The original plan was opposed by the community due to its possible negative environmental and economical impacts. In addition to conducting a full peer review of the different project components, we represented the client in their meetings with the owner and review agencies. This peer review focused on the environmental assessment process, Phase I & II ESAs, human and ecological risk assessments, landfill design, hydraulic performance of the remediation system, modeling of the groundwater flow and contaminants transport, and the effectiveness of the proposed remediation alternative.



Groundwater and Soil Sampling for Commercial Property

A Phase II Environmental Site Assessment (ESA) was conducted for a commercial property in Ottawa's west end. The principal objective of the study was to ascertain the presence or absence of site contamination. The study included sampling and analyzing a number of soil and groundwater samples. The soil samples were analyzed for Petroleum Hydrocarbon Fractions (PHC) F1 to F4, benzene, toluene, ethylbenzene and xylenes (BTEX), and heavy oils. The groundwater samples were analyzed for PHC F1 to F4, BTEX, heavy oils, metals and inorganics (as set out in Ontario Regulation 153/04), and volatile organic compounds (VOCs).