

**Education**

*M.Sc. (Eng.)
Geotechnical/Environmental
Engineering, Queen's
University, 1998*

*B.Sc. Civil Engineering,
Queen's University, 1996*

Certifications

*Xstrata Stage Gate
Training, December 2011*

*Joint Health and Safety
Committee Certified
Member, Gowlings,
February 2008*

*Manager of Landfill
Operations (MOLO)
Technical Associate,
SWANA,
November 2007*

*Towards Sustainable
Mining (TSM) Auditor,
Mining Association of
Canada,
December 2006*

Languages

English – Fluent

Golder Associates Ltd. – Mississauga**Senior Geotechnical Engineer**

Mr. Johnson is a Senior Geotechnical Engineer with over 15 years of experience in mining environmental management and waste facility design. He is a registered Professional Engineer in Ontario, British Columbia, Nunavut, Northwest Territories and Yukon. Mr. Johnson has carried out geotechnical and hydrogeological site investigations, dam design and slope stability assessments, mine closure plans and financial assurance calculations, and design of landfills and mine tailings areas across Canada and around the world. His project experience includes very remote mine sites and permafrost settings. Recently Darrin participated in Xstrata Stage Gate training and he will be leading preparation of Stage Gate deliverables for this project.

Mr. Johnson has been involved with all project lifecycle phases including greenfield site development, feasibility studies, detailed engineering design, approvals, contract tendering, construction, optimization and expansion of existing operations, and closure planning. Darrin has significant experience with dynamic slope stability analysis, liquefaction analysis and design of seismic ground improvement. In addition, Mr. Johnson has been responsible for contract administration and construction monitoring of large multi-disciplinary environmental management projects.

He has contributed to the preparation and review of environmental assessment reports for several new mine and infrastructure projects. Darrin has experience assisting First Nations with solid waste management and review of proposed mining projects on behalf of First Nations. Mr. Johnson has also provided geotechnical engineering expertise for public hearings and assisted with the review of water licence applications for proposed and operating mines.

Employment History**Golder Associates Ltd. – Mississauga, Ontario**

Senior Geotechnical Engineer (2010 to Present)

Project Manager for mine site development, tailings impoundment design and solid waste landfill projects. Responsible for planning and supervision of geotechnical field investigations, technical analyses, engineering design, construction monitoring and reporting.

AECOM (formerly Gartner Lee Limited) – Guelph, Ontario

Senior Geotechnical/Environmental Engineer (2007 to 2010)

Responsible for geotechnical engineering design, review and project management of multidisciplinary mining, contaminated site remediation and solid waste management projects. Post-closure geotechnical inspection of decommissioned mines, landfills and remote arctic military sites.

Gartner Lee Limited – Burnaby, British Columbia

Senior Geotechnical Engineer (2005 to 2007)

Geotechnical engineering for mine and solid waste management facility site



development. Planning and implementation of specialized geotechnical and hydrogeological investigations at remote arctic sites. Environmental assessment of new mine and infrastructure projects.

Gartner Lee Limited – Markham, Ontario

Geotechnical/Environmental Engineer (2003 to 2005)

Design and operations planning for landfills, solid waste transfer stations, organics composting facilities and material recovery facilities (MRFs). Environmental site assessment and contaminated site remediation. Contract administration and construction monitoring.

Golder Associates Ltd. – Mississauga, Ontario

Geotechnical/Environmental Engineer (1995 to 2003)

Site investigation for mine site development, tailings facility design and contaminated site remediation. Engineering design and construction monitoring of mine tailings dams and mine closure earthworks. Environmental site assessment and remedial system design. Static and dynamic slope stability analyses and liquefaction analysis for design and closure of mine tailings dams.

Golder Associates Ltd. – Sudbury, Ontario

Geotechnical Engineer-in-Training (1995 to 1998)

Field investigation, groundwater sampling, laboratory soils testing and reporting.

Trow Consulting Engineers Ltd. – Sudbury, Ontario

Summer Student (1994 to 1994)

Field and laboratory testing of soil and concrete.



PROJECT EXPERIENCE – MINE WASTE MANAGEMENT

Cliffs Natural Resources Inc.
James Bay Lowlands,
Ontario, Canada

Project manager for geotechnical investigation supporting a Pre-Feasibility Study (PFS) of a proposed open pit chromite mine and surface infrastructure facilities.

Osisko Hammond Reef Gold Ltd.
Atikokan, Ontario,
Canada

Assessment of tailings siting options and geotechnical investigation to prepare a project description in support of Canadian Environmental Assessment Act (CEAA) approval for a proposed open pit gold mine.

Agrium Inc. (Phosphate Mine)
Kapuskasing, Ontario,
Canada

Planned and carried out geotechnical and hydrogeological investigations for environmental assessment and design of a new open pit phosphate mine and tailings disposal area. Recent project work included geotechnical design of waste material and ore stockpiles.

Barrick Gold Corporation (Bicroft Mine Inspection)
Bancroft, Ontario,
Canada

Project Manager for annual inspection and monitoring program for the closed uranium mine tailings area. Facilities inspected include 6 water retaining dams and 3 spillway structures.

Constance Lake First Nation (Proposed Phoscan Phosphate Mine)
Martison, Ontario,
Canada

Coordinated a multi-disciplinary technical review of the Preliminary Feasibility Study to identify potential socio-economic and environmental impacts to assist the First Nation with negotiating an Impact Benefit Agreement. Identified operating and post-closure environmental issues and recommended potential mitigation measures.

Xstrata Nickel (Smelter Closure)
Falconbridge, Ontario,
Canada

Assisted with various aspects of preparing a closure plan for a base metal smelter property where mining, milling, and smelting had been carried out for over 50 years. Involvement included geotechnical investigation, groundwater monitoring, slope stability analyses and closure design for tailings and granulated slag areas.

Compania Minera Antamina, S.A.
Peru

Supervised geotechnical and hydrogeological field investigations for design of a tailings impoundment and process water reservoir in the Andes Mountains of Peru.

INCO Ltd. (WD16 Open Pit Mine)
Sudbury, Ontario,
Canada

Collected background hydrological field data for a new open pit mine development including stream water flow measurements, lake and groundwater levels and water chemistry sample collection during regular site visits.

St. Lawrence Cement (Mosport Gravel Pit)
Orono, Ontario, Canada

Carried out slope stability analyses and design of a rehabilitated slope at an active gravel pit.

Rio Algom Limited
Elliot Lake, Ontario,
Canada

Prepared a long-term care, maintenance and monitoring manual for tailings areas at several uranium mines. Developed a risk-based model for calculation of care and maintenance costs.



Xstrata Nickel (Tailings and Waste Rock Storage Area Closure)
Onaping, Ontario, Canada

Conceptual design of three zoned earth dams for flooded closure of the Strathcona tailings area. Supervised construction of the West Morgan Lake tailings containment dam. Prepared a conceptual design and cost estimate for submerged closure of potentially acid generating (PAG) waste rock.

Barrick Gold Corporation (East Malartic and Barnat-Sladen Tailings Areas)
Malartic, QC,, Canada

Geotechnical investigation and collection of tailings and groundwater samples for tailings area closure design.

Caribou Mine
Bathurst, N.B., Canada

Stability analysis and design of an upstream dam raise on tailings to support subaqueous deposition of sulphide tailings.

PROJECT EXPERIENCE – PERMAFROST ENGINEERING

Teck-Cominco Metals Ltd. (Former Polaris Mine)
Nunavut, Canada

Responsible for annual geotechnical inspection of the closed mine site and landfills constructed on continuous permafrost in the high arctic.

Public Works and Government Services Canada (Discovery Mine Landfill)
Northwest Territories, Canada

Involved with construction monitoring and as-built reporting of a landfill designed for disposal of demolition and remediation wastes generated during mine closure in an area with discontinuous permafrost.

Yukon Zinc Corporation (Wolverine Mine)
Yukon, Canada

Carried out a baseline hydrogeology investigation and installed vibrating wire piezometers to monitor the influence of dewatering during a test mining program and assess potential environmental impacts in an area with discontinuous permafrost.

Wolfden Resources (High Lake Mine)
NU, Canada

Planned and implemented a baseline hydrogeology characterization program north of the Arctic Circle. Vibrating wire piezometers were installed in exploration boreholes beneath almost 500 m of permafrost to collect groundwater pressure data in support of an environmental assessment for the proposed mine.

Attawapiskat First Nation (Victor Mine)
Attawapiskat, Ontario, Canada

Responsible for review of geotechnical and engineering aspects for the Victor Diamond Mine Project Comprehensive Study Environmental Assessment developed in an area with discontinuous permafrost.

Rankin Inlet (Landfill Closure)
Nunavut, Canada

Project Manager for development of a closure plan for the Rankin Inlet Municipal solid waste landfill.

Defence Construction Canada
Cambridge Bay, Nunavut, Canada

Project Manager for monitoring and geotechnical inspection of several remediated DEW Line sites with continuous permafrost in the Canadian Arctic.



PROJECT EXPERIENCE – LANDFILL AND SOLID WASTE MANAGEMENT

Chippewas of Rama First Nation (Landfill) Rama, Ontario, Canada	Project manager for estimating landfill closure costs, annual groundwater monitoring, estimating remaining landfill capacity, and providing operations guidance and recommendations for filling remaining landfill airspace.
Greater Vancouver Regional District (Coquitlam Landfill) Coquitlam, B.C., Canada	Project Manager for development of an updated closure plan for the Coquitlam landfill. Assessment and upgrades to an existing landfill gas collection system.
Landfill Design Brunei Darussalam, Azerbaijan, Kolkata (India) and Abu Dhabi (United Arab Emirates)	Design Lead or team member for several large regional municipal solid waste management facilities and landfills. Calculation of landfill gas equivalent carbon greenhouse gas credits.
Closed Landfill Redevelopment Toronto, Ontario, Canada	Geotechnical design, landfill gas modelling and Certificate of Approval air application to support redevelopment of a closed landfill for use as a paved vehicle training facility.
Village of Cache Creek British Columbia, Canada	Site inspection and review of the annual report for a large regional landfill that receives approximately 500,000 tonnes of municipal solid waste per annum.
ESCO Limited (Landfill Cell Design) Port Coquitlam, B.C., Canada	Design Lead for an HDPE geomembrane lined landfill cell for disposal of foundry waste materials.
Regional District of Bulkley-Nechako Vanderhoof, B.C., Canada	Design Lead of a new municipal solid waste landfill and final construction inspection.
British Columbia Environmental Assessment Office Victoria, B.C., Canada	Evaluation of the performance of a composite HDPE and GCL landfill liner for a proposed regional landfill.
Columbia Shuswap Regional District Sicamous, B.C., Canada	Preparation of an updated Design and Operations Plan for a small rural municipal solid waste landfill and specification of heavy equipment for earthworks and waste compaction.
Squamish Lillooet Regional District Pemberton, B.C., Canada	Preparation of a closure plan and final cover design for the Pemberton Landfill.
District of Kitimat Kitimat, B.C., Canada	Preparation of an updated Design and Operations Plan for a small rural municipal solid waste landfill.
City of Guelph Guelph, Ontario, Canada	Preparation of an operations manual for an organic waste processing facility.



**Regional Municipality
of Niagara**
Niagara Falls, Ontario,
Canada

Construction administration of the Niagara Enviro Centre Material Recovery Facility (MRF).

**Regional Municipality
of Niagara**
Port Colborne, Ontario,
Canada

Resident Engineer responsible for QA/QC monitoring of a clay barrier liner for an upgraded landfill leachate collection system at the Elm Street landfill.

**Ontario Power
Generation**
Thunder Bay, Ontario,
Canada

Final cover design and closure cost estimates for a fly ash landfill.

PROJECT EXPERIENCE – CONTAMINATED SITE REMEDIATION

GE Canada
Toronto, Ontario ,
Canada

Health and Safety Manager for several contaminated sites with active remediation programs.

Squamish Nation
North Vancouver, B.C.,
Canada

Project Manager for a soil remediation contract involving excavation and disposal of over 2,700 tonnes of creosote impacted soil.

**Ontario Power
Generation**
Toronto, Ontario,
Canada

Technical Lead for soil and groundwater investigation to characterize historic hydrocarbon contamination and design of a remedial groundwater extraction trench at the decommissioned Hearn coal generating plant.

**Canadian National
Railway**
Concord, Ontario,
Canada

Project Manager for investigation of hydrocarbon impacted soil, groundwater and surface water at a large railway yard and identification of remedial options

**Ministry of
Environment**
Hamilton, Ontario,
Canada

Project Manager for the remediation of a large plastics fire at the former Plastimet site.

**Various Clients and
Locations**

Project Manager for Phase II Environmental Site Assessment (ESA) of sites contaminated with heavy metals, hydrocarbons, PCBs, and explosives and development of remedial options and cost estimates.

TRAINING

Xstrata Stage Gate Training, Xstrata, Montreal, Quebec, December 2011

Facilitation, Golder Associates, Calgary, Alberta, January 2011

Project Management, Golder Associates, Mississauga, Ontario, May 2010

Environmental Regulation and Compliance Seminar, Envirogate, Toronto, Ontario, November 2008

***Emerging Technologies in Mine Waste Management Seminar***

APEGBC, Vancouver, B.C., April 2007

Canadian Environmental Assessment Act (CEAA) for Mining Projects

Ontario Mining Association (OMA), Toronto, Ontario, October 2004

Mentoring Skills for Leaders, SkillPath, Markham, Ontario, September 2004

Air Photo Interpretation, John Gartner, Markham, Ontario, March 2004

40 Hour Hazardous Waste Operations and Emergency Response

Training, Mississauga, February 2001

PROFESSIONAL AFFILIATIONS

Professional Engineer, Professional Engineers Ontario (PEO)

Assoc. of Professional Engineers and Geoscientists of British Columbia

Assoc. of Professional Engineers, Geologists and Geophysicists of NWT and Nunavut

Association of Professional Engineers of Yukon

Member, Canadian Geotechnical Society (CGS)

PUBLICATIONS AND PRESENTATIONS

Conference Proceedings

Johnson, D. 2011. *Use of Engineered Landfills for Arctic Mine Site Reclamation*. Mine Closure Conference 2011, September, Lake Louise, AB, Canada.

Johnson, D. 2006. *Baseline Hydrogeological Testing and Instrumentation of Deep Exploration Boreholes for Mine Environmental Assessment*. Canadian Geotechnical Society Conference, October, Vancouver, BC, Canada.

Johnson, D. 2004. *Environmental Issues Associated with Dewatering Mine Excavations*. Canadian Geotechnical Society and International Association of Hydrogeologists Conference, October, Quebec City, Canada.

Presentations

"Mine Waste Management and Geotechnical Engineering". Queen's University and Royal Military College GeoEngineering Graduate Students, January 2012, Ontario, Canada.

"Geotechnical Slope Stability Considerations at Pits and Quarries". Ontario Sand Stone and Gravel Association (OSSGA) Rehabilitation Tour, September 2009, Bowmanville, Ontario, Canada.

"Geotechnical and Geoenvironmental Engineering Case Studies". Queen's University and Royal Military College GeoEngineering Graduate Students, November 2004, Ontario, Canada.

"Liquefaction and Dynamic Stability Analysis of Earth Structures and Slopes". Golder Associates Short Course, March 2003, Mississauga, Ontario, Canada.