



MONENCO ONTARIO LIMITED

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WITNESS STATEMENT

OF

KEVIN J.D. RIDLEY
HYDROGEOLOGIST
MONENCO ONTARIO LIMITED

IN THE MATTER OF AN APPLICATION
FOR A CERTIFICATE OF APPROVAL
BY THE REGION OF HALTON FOR
EXPANSION OF THE BURLINGTON
LANDFILL SITE IN THE REGIONAL
MUNICIPALITY OF HALTON AND CONCERNS
THE ASPECTS OF HYDROGEOLOGY AND RELATED FIELDS

1984-05-31

1. Statement by: Kevin J.D. Ridley
Hydrogeologist
Monenco Ontario Limited
Colonia Place
Two St. Clair Avenue East
Toronto, Ontario
M4T 2T5
Telephone: 416-961-4590
2. Statement for: This statement and related studies were prepared at the request of the Environmental Assessment Board in the matter of an application for a Certificate of Approval by the Region of Halton for expansion of the Burlington Landfill site in the Regional Municipality of Halton.
3. Qualifications and Expertise:

I was born and raised in St. Catharines, Ontario. In 1969, I attended McMaster University in Hamilton, Ontario where I received an honours degree in Geology (magna cum laude) in 1973. In 1973, I attended the University of Windsor, and in 1975, received a masters degree in geology specializing in geochemistry. From 1975 to 1977, I attended the University of Alberta conducting doctoral studies in hydrogeology. During my tenure at the University of Alberta I was an Izaak Walton Killam scholar. In 1979, I attended the University of Windsor and commenced doctoral studies in civil engineering specializing in water resources and sanitary/environmental engineering. The Ph.D. degree has been successfully defended and I anticipate formal granting of the degree in 1984 pending review of the revisions.

Since graduating in 1973, I have been employed by firms consulting in hydrogeology and engineering geology. I have lectured in courses as a faculty member in both the Departments of Geology and Civil Engineering at the University of Windsor. At present I am a Hydrogeologist with Monenco Ontario Limited, Toronto. I am a Registered Professional Geologist in the Province of Alberta. During my career, I have kept abreast of technological advances in hydrogeology and related fields by attending courses at recognized universities and conferences in Canada and the U.S.A.

My personal experience in hydrogeology embraces the hydrogeologic impact of the following:

- mining activities
- sanitary and toxic waste sites
- hydrocarbon leaks and spills
- the storage and leakage of brine in lined surface storage reservoirs
- dams
- dewatering activities
- land application of wastewater

In addition, I have experience involving groundwater resources evaluation, modelling of groundwater flow and solute transport, trace metal and aqueous geochemistry, supervision of drilling and field instrument installation, analysis of wastewater and sludge, and project management.

In summary, my qualifications and experiences relevant to hydrogeology and related fields qualifies me to give opinion evidence as an expert in these fields. I have attached my curriculum vita for further details as to my qualifications.

4. Content of Statement:

My evidence will be directed to the following matters:

- Hydrogeologic setting
- Leachate chemistry
- Groundwater chemistry
- Lateral groundwater flow velocity in the shale
- Delineation of plume and BH-17
- Analysis of leachate advance and breakthrough from the till
- Effectiveness of both the retro-fitted toe drain and the proposed toe drain for the continued use area
- Potential and present impact of leachate exfiltration on the hydrogeologic regime of the continued use area, Phases A and C, and the original landfill site

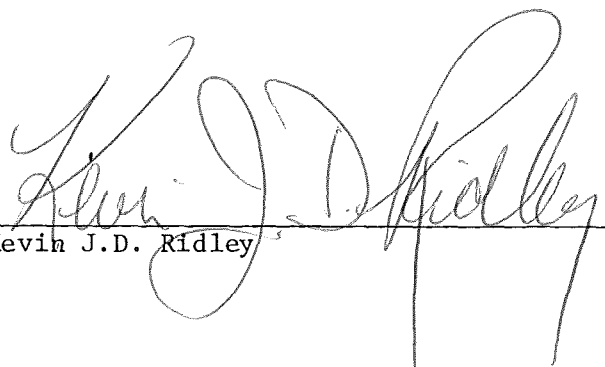
- The physical and chemical integrity of the till in a leachate environment
- Monitoring and field reconnaissance program
- Environmental risk assessment of the Burlington Landfill expansion
- Other relevant matters raised at the Hearing within my area of expertise.

With the exception of the last matter, all matters listed above are discussed in my report submitted to the Environmental Assessment Board, May 30, 1984.

5. Availability of Witness:

I will be available to attend before the Environmental Assessment Board and be subject to examination and cross examination, if required to do so.

Dated at Toronto, Ontario this 1st day of June, 1984.



Kevin J.D. Ridley

CURRICULUM VITA

KEVIN J.D. RIDLEY



Monenco

KEVIN J. D. RIDLEY, P.Geol.

Hydrogeologist
Resources Department

YEAR OF BIRTH: 1950.

EDUCATION: Ph.D. (Civ. Eng.) Specializing in Water Resources and Sanitary/Environmental Engineering, successful defense, anticipate formal granting of degree in 1984 pending review of revisions, University of Windsor, 1984.
Doctoral Studies (Geol.) Specializing in Hydrogeology, University of Alberta, 1975-1977.
M.Sc. (Geol.) Specializing in Geochemistry, University of Windsor, 1975.
B.Sc. (Honours Geol.), McMaster University, 1973.

EXPERIENCE: A range of activities related to ground and surface water resources including groundwater development, protection and amelioration; dewatering and drainage; environmental impact of industrial development on ground and surface water bodies and containment of municipal and hazardous liquid and solid wastes.

1984 to date: Hydrogeologist, Resources Department, Monenco, Toronto, Ontario. Involved in:

- hydrogeological input to environmental study for a thermal generating station involving effects of ash storage/disposal on local surface and groundwaters in Chatham, New Brunswick;
- baseline hydrogeological investigation of a mining lease in New Brunswick prior to pit development. This involved defining the effect of the pit and diversion of a small river on the groundwater flow pattern and groundwater quality as well as defining the feasibility of flooding upon completion of mining and its effect on groundwater flow and quality;
- technical review of material submitted to regional government for expansion of the Burlington Landfill Site. This also involved preparation of cross-examination and attendance at the Hearing;
- appointed by the Environmental Assessment Board for Ontario as its expert witness in hydrogeology and related fields in respect of the Hearing for expansion of the Burlington Landfill Site.

- 1983 - 1984: Geohydrologist, Acres Consulting Services Limited, Niagara Falls, Ontario. Involved in:
- analysis of pumping test data for mine dewatering, Wabush, Labrador;
 - review of geohydrological data from abandoned toxic waste site, Niagara Falls, New York.
 - Technical review of legal settlement;
 - field investigation of a hydrocarbon leak in fractured bedrock/till, New Brunswick;
 - compilation and analysis of geohydrological data, Saudi Arabia.
- 1979 - 1982: Sessional Instructor and Research Assistant, Department of Civil Engineering, University of Windsor and Industrial Research Institute, University of Windsor, Windsor, Ontario. Involved in:
- supervision of sanitary/environmental laboratories, lecturing in senior undergraduate courses in environmental engineering, conducted research towards dissertation, supervised senior undergraduate research projects.
- Consultant. Involved in:
- pilot plant studies, analysis of wastewater and sludge, BOD and COD analyses, analysis of groundwater for total and fecal coliform, and general analytical work;
 - technical support to contest location of industrial landfill site near Tilbury, Ontario.
- 1978 - 1979: Visiting Assistant Professor, Department of Geology, University of Windsor, Windsor, Ontario. Involved in:
- lecturing courses in geology and geochemistry;
 - supervision of geochemistry laboratory;
 - supervision of senior undergraduate research projects and graduate students.
- 1977 - 1978: Project Hydrologist, Mining Geotechnical Group, EBA Engineering Consultants Ltd., Edmonton, Alberta. Involved in:
- hydrological input for engineering projects which included a large open-pit coal mine involving design and installation of deep piezometers for slope stability in working pit, area groundwater survey in virgin coal lease for design of

- 1977 - 1978:
(Cont'd)
- dewatering system, supervision of field personnel, sampling of wells for chemical analysis, pumping tests, mapping and development of conceptual model; dewatering system for excavation and construction of a sewage lift station involving supervision of field personnel, installation of pneumatic piezometers, pumping test and design of dewatering system;
- investigation of leakage of a saturated brine from a clay-lined storage lagoon involving sampling existing observation wells and use of geophysical techniques to delineate plume migration;
 - groundwater pollution studies;
 - groundwater supply;
 - feasibility studies for landfill sites.
- 1975 - 1977:
- Teaching and Research Assistant, University of Alberta, Edmonton, Alberta. Teaching and research assistant for graduate and undergraduate courses.
- 1976 (Summer):
- Hydrogeologist, Hydrogeological Consultants Ltd., Edmonton, Alberta. Involved in:
- baseline groundwater survey prior to the spray irrigation of treated sour gas refinery wastes;
 - rural groundwater supply; study to define areas that contain suitable quality and quantity of groundwater for future growth and development of City of Edmonton.
- 1973 - 1975
- Teaching Assistant, University of Windsor, Windsor, Ontario. Teaching assistant for graduate and undergraduate course.
- 1974, 1975:
(Summers)
- Engineering Geologist, Acres Consulting Services, Niagara Falls, Ontario. Involved in:
- investigation of groundwater conditions at a lead-zinc mine in Newfoundland; preliminary investigation study of the stability of a cliff face above a power station at Niagara Falls;
 - hydrogeochemical study of a rural area prior to reservoir impounding; feasibility study for location of a shipyard in Korea; feasibility study for the economic potential of sand and gravel deposits in Halifax Harbour; measuring and mapping of cracks in a tunnel at Thorold, Ontario.

PAPERS
PUBLISHED IN
REFEREED
JOURNALS:

"Behaviour of Compacted Fine Grained Soil in a Brine, Environment." Ridley, K. J. D., Bewtra, J. K. and McCorquodale, J. A. 1984. Canadian Journal of Civil Engineering (in press) to be published June 1984.

"The Variability of Chemical Analyses as a Function of Sample Heterogeneity and the Implications to the Analyses of Rock Standards." Ridley, K. J. D., Turek, A. and Riddle, C. 1976. Geochim. Cosmochim. Acta, 40, pp 1375 - 1379.

PAPERS IN
REFEREED
CONFERENCE
PROCEEDINGS:

"Impact of Brine on the Behaviour of Compacted Fine Grained Soil." Ridley, K. J. D., Bewtra, J. K. and McCorquodale, J. A. 1983. Proceedings, Municipal Environment Division of the 1983 CSCE Conference, Ottawa, Canada. pp 141 - 158.

"Breakthrough of Brine Through Compacted Fine Grained Soils." Ridley, K. J. D. and Bewtra, J. K. 1983. Proceedings of the 38th Annual Purdue Industrial Waste Conference, Purdue University, Lafayette, Indiana, U.S.A. (in press 25 pp)

"The Variability of Chemical Analyses as a Function of Sample Heterogeneity and the Implications to the Analyses of Rock Standards." Proceedings of the 29th Annual Meetings of the Geological Association of Canada, Edmonton, Alberta, Canada.

"The Variability of Chemical Analyses as a Function of Sample Heterogeneity and the Implications to the Analyses of Rock Standards." Ridley, K. J. D., Turek, A. and Riddle, C. 1976. Proceedings of the 1976 Geological Society of American Eastern Conference, Kalamazoo, Michigan, U.S.A.

OTHERS:

"Analyses of Trace and Major Elements in Brines Using DCP." Invited speaker, Canadian SpectraSpan User's Seminar, Toronto, Ontario, Canada.

"Erosion - northwestern Alberta." Flint, D., Lobb, G., Locat, J., Ridley, K., Ross, D. and Waters, P. 1976. A technical report submitted to the Public Hearings on Erosion of Land - northwestern Alberta, Volume VII, Supplementary Briefs, Alberta Environment Conservation Authority, pp 66 - 139.

PROFESSIONAL
MEMBERSHIPS:

Member, Association of Professional Engineers, Geologists and Geophysicists of Alberta.