



Sustainable Development

Environmental Stewardship Division

Environmental Approvals Branch

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CLIENT FILE NO.: 5439.00

September 5, 2019

Mr. Steve McCabe
Facility Manager
MidCanada Environmental Services Ltd.
1090 Kenaston Blvd.
Winnipeg, MB R3P 0R7
smccabe@gfenv.com

Dear Mr. McCabe:

Enclosed is **Environment Act Licence No. 3014 RR**, issued to **MidCanada Environmental Services Ltd.** for the construction and continuing operation of the Development being a soils treatment facility located at the property described as part of Legal Sub-Division 4 of 32-8-4 EPM, in the Rural Municipality of Ritchot, Manitoba in accordance with the proposal filed under The Environment Act on December 22, 2009.

In addition to the enclosed Licence requirements, please be informed that all other applicable federal, provincial and municipal regulations and by-laws must be complied with. A Notice of Alteration must be filed with the Director for approval prior to any alteration to the Development as licensed.

If you have any questions on this matter, please contact Nada Suresh, Environment Officer, at 204-794-3607. For licensing issues, contact Cory Graham at 204-250-7645.

Pursuant to Section 27 of The Environment Act, this licensing decision may be appealed by any person who is affected by the issuance of this Licence to the Minister of Sustainable Development within 30 days of the date of the Licence.

Sincerely,

Siobhan Burland Ross, M.Eng., P.Eng.
Director
The Environment Act

c: Shannon Kohler /Yvonne Hawryliuk/Nada Suresh: Environmental Compliance and Enforcement
Siobhan Burland Ross: Environmental Approvals
Public Registries

NOTE: Confirmation of receipt of this Licence No. 3014 RR (by the Licencee only) is required by the Director of Environmental Approvals. Please acknowledge receipt by signing in the space below and email a copy of this letter to Cory.Graham@gov.mb.ca by October 3, 2019.

LICENCE

Licence No. / Licence n°: 3014 RR

Issue Date / Date de délivrance: July 30, 2012

REVISED: January 21, 2013

REVISED: September 5, 2019

In accordance with The Environment Act (C.C.S.M. c. E125) /
Conformément à la Loi sur l'environnement (C.P.L.M. c. E125)

Pursuant to Section 10(1) / Conformément au Paragraphe 10(1)

THIS LICENCE IS ISSUED TO: / CETTE LICENCE EST DONNÉE À:

MIDCANADA ENVIRONMENTAL SERVICES LTD.
"the Licencee"

for the construction and continuing operation of the Development being a soils treatment facility located at the property described as part of Legal Sub-Division 4 of 32-8-4 EPM, in the Rural Municipality of Ritchot, Manitoba in accordance with the proposal filed under The Environment Act on December 22, 2009 and the additional information received on May 16, 2011, September 26, 2012, and on April 20, 2016 and subject to the following specifications, limits, terms, and conditions:

DEFINITIONS

In this Licence,

"accredited laboratory" means an analytical facility accredited by the Standard Council of Canada (SCC), or accredited by another accrediting agency recognized by Manitoba Sustainable Development to be equivalent to the SCC, or be able to demonstrate, upon request, that it has the quality assurance/quality control (QA/QC) procedures in place equivalent to accreditation based on the International Standard ISO/IEC 17025, or otherwise approved by the Director;

"affected area" means a geographical area, excluding the property of the Development;

"approved" means approved by the Director or assigned Environment Officer in writing;

"BTEX" means the following components of gasoline and other specific petroleum products:

B = Benzene;

T = Toluene;

E = Ethylbenzene; and

X = Xylene;

"Director" means an employee so designated pursuant to The Environment Act;

"Environment Officer" means an employee so designated pursuant to The Environment Act;

"hydrovac slurry materials" means the water, soil, possible chemical and organic mix of materials which is the result of the high pressure water and vacuum pumping excavation technique referred to as hydrovac excavation;

"noise nuisance" means an unwanted sound, in an affected area, which is annoying, troublesome, or disagreeable to a person:

- a) residing in an affected area;
- b) working in an affected area; or
- c) present at a location in an affected area which is normally open to members of the public;

if the unwanted sound

- d) is the subject of at least 5 written complaints, received by the Director in a form satisfactory to the Director and within a 90-day period, from 5 different persons falling within clauses a), b) or c), who do not live in the same household; or
- e) is the subject of at least one written complaint, received by the Director in a form satisfactory to the Director, from a person falling within clauses a), b) or c) and the Director is of the opinion that if the unwanted sound had occurred in a more densely populated area there would have been at least 5 written complaints received within a 90-day period, from 5 different persons who do not live in the same household;

"non-impacted water" means water that was received in hydrovac slurry materials, but analyses confirm that it conforms with requirements of Manitoba Water Quality Standards, Objectives, and Guidelines;

"odour nuisance" means a continuous or repeated odour, smell or aroma, in an affected area, which is offensive, obnoxious, troublesome, annoying, unpleasant or disagreeable to a person:

- a) residing in an affected area;
- b) working in an affected area; or

- c) present at a location in an affected area which is normally open to members of the public;

if the odour, smell or aroma

- d) is the subject of at least 5 written complaints, received by the Director in a form satisfactory to the Director and within a 90-day period, from 5 different persons falling within clauses a), b) or c), who do not live in the same household; or
- e) is the subject of at least one written complaint, received by the Director in a form satisfactory to the Director, from a person falling within clauses a), b), or c) and the Director is of the opinion that if the odour, smell or aroma had occurred in a more densely populated area there would have been at least 5 written complaints received within a 90-day period, from 5 different persons who do not live in the same household;

"operator" means the company or person who is responsible for the day-to-day maintenance and operation of the Development;

"PAH" means polycyclic aromatic hydrocarbon;

"particulate matter" means any finely divided liquid or solid matter other than water droplets;

"particulate residue" means that part or portion of an atmospheric emission which is deposited onto a surface; and

"Standard Methods for the Examination of Water and Wastewater" means the most recent edition of Standard Methods for the Examination of Water and Wastewater published jointly by the American Public Health Association, the American Water Works Association and the Water Environment Federation.

GENERAL TERMS AND CONDITIONS

1. The Licencee shall, at all times maintain a copy of this Licence at the Facility or at the premises from which the Facility's operations are managed.
2. The Licencee shall maintain a high standard of equipment maintenance and good housekeeping and operational practices with respect to the Development, at all times.
3. The restrictions and conditions of this Licence are severable. If any restriction or condition of this Licence, or the application thereof, to any circumstances is held invalid, the application of such restriction or condition to other circumstances and the remainder of this Licence shall not be affected thereby.

Future Sampling

4. The Licencee shall at the request of the Director:
 - a) conduct special studies to determine ambient air quality within the vicinity of the Development and/or emission testing for specified air pollutants in a manner satisfactory to the Director; and
 - b) submit a report containing the ambient air quality data and/or the emission testing data and all other related data to the Director within ninety (90) days after completion of the studies.
5. In addition to any terms or conditions specified in this Licence, the Licencee shall, upon the request of the Director:
 - a) sample, monitor, analyze and/or investigate specific areas of concern regarding any segment, component or aspect of pollutant storage, containment, treatment, handling, disposal or emission systems, for such pollutants or ambient quality, aquatic toxicity, leachate characteristics and discharge or emission rates, for such duration and at such frequencies as may be specified;
 - b) determine the environmental impact associated with the release of any pollutant(s) from the Facility;
 - c) conduct specific investigations in response to the data gathered during environmental monitoring programs; or
 - d) provide the Director within such time as may be specified, with such reports, drawings, specifications, analytical data, descriptions of sampling and analytical procedures being used, bioassay data, flow rate measurements and such other information as may from time to time be requested.

Sampling Methods

6. The Licencee shall, unless otherwise specified in this Licence:
 - a) carry out all preservations and analyses on liquid samples in accordance with the methods prescribed in the most current edition of Standard Methods for the Examination of Water and Wastewater or in accordance with equivalent preservation and analytical methodologies approved by the Director;
 - b) carry out all sampling of, and preservation and analyses on soil or air samples in accordance with methodologies approved by the Director;
 - c) have all analytical determinations undertaken by an accredited laboratory; and
 - d) report the results to the Director, in writing and in an electronic form acceptable to the Director within sixty (60) days of the samples being taken, or within another time frame as specified by the Director.

Maintain Records

7. The Licencee shall, unless otherwise specified by this Licence, retain all records during the full life of operation of the facility, and after closure, for such period of time as may be specified by the Director. Records may be transferred from their original form to other accepted forms for information storage.

Reporting Format

8. The Licencee shall submit all information required to be provided to the Director or Environment Officer under this Licence, in written and electronic format, in such form (including number of copies) and of such content as may be specified by the Director or Environment Officer, and each submission shall be clearly labelled with the Licence Number and Client File Number associated with this Licence.

Remedial Measures

9. The Licencee shall carry out, as deemed necessary by the Director or Environment Officer, any remedial measures or modifications in respect to matters authorized under this Licence.

Responsible Party

10. The Licencee shall designate an employee, within sixty (60) days of the date of issuance of this Licence, as the Licencee's Environmental Coordinator, whose job description will include assisting the Licencee in complying with the limits, terms and conditions in this Licence and assisting Senior Management of the Licencee to manage environmental issues at the Facility. The name of the Environmental Coordinator shall be submitted in writing to the Director within fourteen (14) days of the appointment and any subsequent appointment.

Fire Reporting

11. The Licencee shall in the event of a fire which continues in excess of thirty (30) minutes, or requires implementation of the Emergency Response Plan, or requires fire suppression assistance from personnel outside of the Development (e.g. fire department) report the fire by calling the 24 hour environmental emergency reporting line at (204) 944-4888 (toll free 1-855-944-4888), identifying the type of materials involved and the location of the fire.

Approvals and Permits

12. The Licencee shall locate fuel storage and equipment servicing areas established for the construction and operation of the Development in compliance with the requirements of Manitoba Regulation 188/2001 respecting Storage and Handling of Petroleum Products and Allied Products or any future amendments thereof.

13. The Licencee shall obtain approval in writing from the Director for any proposed alteration to the Development before proceeding with the alteration.

Air Emissions, Noise and Odours

14. The Licencee shall not emit particulate matter from the Development such that particulate matter:
 - a) exhibits a visible plume with an opacity of greater than 5 percent at any point beyond the property line of the Development; or
 - b) results in the deposition of visible particulate residue at any time beyond the property line of the Development.
15. The Licencee shall not cause or permit a noise nuisance to be created as a result of the construction, operation, or alteration of the Development, and shall take such steps as the Director may require to eliminate or mitigate a noise nuisance.
16. The Licencee shall not cause or permit an odour nuisance to be created as a result of the operation of the Development, and shall take such steps as the Director may require to eliminate or mitigate an odour nuisance.

SPECIFICATIONS, LIMITS, TERMS, AND CONDITIONS

Temporary Storage of Materials

17. In the event of a spill to the environment, the Licencee may receive petroleum contaminated soils at the Development and stockpile temporarily with the approval of and subject to any terms and conditions set by an Environment Officer.

Incoming Soils

18. The Operator shall retain sample results from all soils received at the soil remediation facility; if results are not available from the source of the soils, the Operator shall have the soils tested upon receipt. The parameters for which the soils shall be analyzed will be determined by considering the source of the soils and by using the CCME Canadian Environmental Quality Guidelines and the Canada-Wide Standards for Petroleum Hydrocarbons (PHC) in Soil.

Construction – Soil Remediation Base

19. The Licencee shall upgrade the cell base as existing soil piles are removed.
20. The Licencee shall, prior to upgrading the cell base, submit two paper copies and one electronic copy of final engineering design plans, sealed by an engineer(s) registered with

Engineers Geoscientists Manitoba, to the Director for approval. The plans will show the engineering details of each new cell base.

21. The Licencee shall construct the cell base in accordance with the design plans approved by the Director pursuant to Clause 20 of this Licence.
22. The Licencee shall construct and maintain the cell base with a continuous clay liner under all interior surfaces of the cell in accordance with the following specifications:
 - a) the clay liner is recompacted to a minimum thickness of 0.5 metre for the side slopes and for the base; and
 - b) the hydraulic conductivity of the clay liner is 1×10^{-7} cm/second or less.
23. The Licencee shall arrange with the assigned Environment Officer a mutually acceptable time and date for any required soil sampling to confirm the material achieves the specifications of Clause 22; between the 15th day of May and the 15th day of October of any year, unless otherwise approved by the Environment Officer
24. The number and location of samples and test methods will be specified by the designated Environment Officer up to a maximum of twenty (20) samples per cell or clay component of the Development.
25. The Licencee shall, prior to operation of any area tested in accordance with Clause 23 receive the approval of the Environment Officer for the results of the tests carried out pursuant to Clause 23 of this Licence.
26. The Licencee shall:
 - a) prepare "record drawings" for the Development and shall label the drawings "record drawings"; and
 - b) provide to the Director, 30 days after completion of construction, two paper copies and one electronic copy of "record drawings" of the soils recycling facility and all related facilities on the site of the Development.

Operation

27. No petroleum contaminated soils classified, as hazardous waste shall be received at the Development.
28. Notwithstanding Clause 27, the Licencee shall only accept for treatment at the Development, unless otherwise approved by an Environment Officer, soils or hydrovac slurry materials in accordance with the following acceptance criteria:
 - a) Soil contaminated with Benzene, Toluene, Ethylbenzene or Xylenes up to 30,000 mg/kg for each constituent;
 - b) Soil contaminated with Canada Wide Standard for Petroleum Hydrocarbons Fraction 1, 2, 3 or 4 up to 30,000 mg/kg for each Fraction; and
 - c) Soil contaminated with metals at any concentration subject to capability to treat to achieve leachate extraction criteria.

Soil Treatment Criteria

29. The Licencee shall treat soil to the following cleanup criteria:
 - a) “Criteria for Acceptance of Contaminated Soil at Waste Disposal Grounds (June 2016)” or any future amendment thereof; or
 - b) as approved by the Director.
30. The Licencee shall develop, within 90 days after the issuance of this Licence, an operations manual for the Development. The operations manual shall address, but not be limited to the following:
 - a) soil remediation procedures;
 - b) handling and treatment procedures;
 - c) inspection and maintenance;
 - d) soil receiving and placement;
 - e) surface water management; and
 - f) monitoring and reporting.
31. The Licencee shall implement the operations manual developed pursuant to Clause 30 of this Licence, and subject to any terms and conditions set by the Director.

Hydrovac Slurry Materials

32. The Licencee shall construct and operate the Hydrovac Slurry Treatment Facility in accordance with the plans and design submitted on April 20, 2016.
33. The Licencee shall have analyses available, to an Environment Officer upon request, for any excess non-impacted water received from hydrovac slurry materials that are transported off or allowed to leave the Development.
34. The Licencee shall transport all wastewater or impacted water from the hydrovac slurry facility that is not managed at the Development to a wastewater treatment development operating under an Environment Act Licence and approved by an Environment Officer to accept the wastewater.

Monitoring

35. The Licencee shall maintain a monitoring program and records that shall address, but not be limited to the following:
 - a) background information on groundwater quality prior to operation of the Development;
 - b) ongoing monitoring during Development operation; and
 - c) the frequency of monitoring.
36. The Licencee shall undertake the sampling and analysis of the background water quality for groundwater in accordance with the plan approved pursuant to Clause 35, of this

Licence. Monitoring shall include the chemical and microbiological parameters listed in Table 1 of this Licence.

37. The Licencee shall compare the analytical results obtained for the sampling carried out pursuant to Clause 36 with the levels that were determined in the wells prior to the operation of the Development.

Air Monitoring

38. The Licencee shall operate the Development such that ground level concentrations of any of the following pollutants, at the property line, are not in excess of the following limits as determined from any ambient air sample or samples collected and analyzed, upon the request of the Director, in accordance with procedures and methods satisfactory to the Director:

Air Pollutant	Averaging Period	Ground Level Concentration Limits
Benzene	24 hour average	150 micrograms per cubic metre of air
Toluene	24 hour average	2000 micrograms per cubic metre of air
Ethylbenzene	24 hour average	4000 micrograms per cubic metre of air
Xylenes	24 hour average	2300 micrograms per cubic metre of air

39. The Licencee shall, at such times, for such duration, for such pollutants and at such locations as may be requested by the Director:
 - a) arrange to have a qualified person(s) undertake source tests and/or special studies to determine the ambient air quality beyond the property line of the Development, in a manner satisfactory to the Director, and including an interpretation of the results relative to the limits of Clause 38 of this Licence; and
 - b) submit a report on the test results and all related data, including the interpretation, to the Director within 90 days after completion of the test or study.

Reporting

40. The Licencee shall inform the assigned Environment Officer whenever an odour complaint is received and provide to the Environment Officer a report on the incident, including information on what action was taken to resolve the concerns.
41. The Licencee shall inform the assigned Environment Officer whenever a noise complaint is received and provide to the Environment Officer a report on the incident, including information on what action was taken to resolve the concerns.
42. The Licencee shall report to the assigned Environment Officer all incidents requiring contingency plan action regarding groundwater or surface water pollution within seven (7)

days from the occurrence of such incidents, including the nature of the incident, substances involved, the area affected, action taken and follow up action proposed to be taken.

43. The Licencee shall keep for inspection, records of all monitoring at the Development, at the operator's office.
44. The Licencee shall maintain, at the site office, records of all soils and hydrovac slurry material loads received at the Development. These records shall contain, but not be limited to the following:
 - a) the date materials were received at the facility;
 - b) the original location of the material;
 - c) the volume received, either estimated or actual;
 - d) preliminary analyses of the soils or hydrovac slurry material, e.g. head space results or field composite results;
 - e) results of laboratory analyses of the materials;
 - f) the frequency of sampling, area of sampling and the depth the sample was taken from within the treatment area; and
 - g) the location within the facility the material was placed for treatment.
45. The Licencee shall maintain, at the operator's office, records of all materials removed from the Development. These records shall contain, but not be limited to the following:
 - a) the date the material was removed;
 - b) the volume of material removed;
 - c) the final end use destination of the material removed;
 - d) the results of analyses to determine the concentrations of those parameters for which the material was being remediated; and
 - e) any additional information as requested by the Director.
46. The Licencee shall have available for inspection by an Environment Officer upon request the records referred to in Clauses 44 and 45 of this Licence and shall provide annually to the Director a report summarizing the activities at the Development in the annual report pursuant to this Licence.

Surface Water

47. The Licencee shall prevent, by means of dyking, or other method(s) approved by the Director, the migration of surface water onto or off of the Development. Any surface waters retained at the Development shall be collected and analyzed for the following parameters, or others as approved by the Director, prior to discharge:
 - a) BTEX;
 - b) naphthalene;
 - c) benzo(a)pyrene;
 - d) petroleum hydrocarbons; and
 - e) total metals.

48. The Licencee shall only discharge water from the Development after obtaining approval from the Director or Environment Officer for the discharge.

Annual Report

49. The Licencee shall, unless otherwise approved by the Director, on or before the 15th day of April of each year, submit to the Director an annual report with respect to all activities at the Development conducted pursuant to this Licence during the previous calendar year. The format of the report shall be approved by the Director and contain, as a minimum, the following information:
 - a) the amount and type of petroleum contaminated soils treated at the soil remediation facility and a summary of the results of after treatment analyses of petroleum contaminated soils and the final disposition of the treated soils;
 - b) the amount and type of hydrovac slurry materials received and treated;
 - c) a summary of all citizen complaints concerning dust, noise and odour from the Development together with a report on each incident that includes information on what actions were taken to resolve the concerns;
 - d) summary reports and details of all incidents that required implementation of the contingency plan;
 - e) with respect to the groundwater well monitoring programs:
 - i) the results for the monitoring wells of the analyses of the chemical and microbiological parameters listed in Table 1 of this Licence;
 - ii) an assessment of the results of the groundwater analyses;
 - iii) the date(s), exact place, and time(s) of sampling or measurements;
 - iv) the date(s) analyses were performed;
 - v) the individual(s) who performed the analyses;
 - vi) documentation to verify the appropriate certification of the laboratory used to perform the analyses; and
 - vii) quality assurance and quality control data.

Contingency Plan

50. The Licencee shall maintain a contingency plan to be implemented in the event that a monitoring program identifies any pollutant in surface or ground water, as a result of the operation of the Development, in excess of background levels.
51. Where the Licencee fails to undertake the monitoring program developed pursuant to Clause 50, of this Licence, the Director may cause such monitoring to be undertaken and recover the cost of such monitoring from the Licencee.

Emergency Response Plan

52. The Licencee shall submit, within 60 days of the date of issuance of this Licence, for the approval of the Director, a plan relating to emergency planning and response at the Development. The plan shall be developed and maintained in accordance with the

Industrial Emergency Response Planning Guide (MIAC September, 1996) or other equivalent standard approved by the Director.

53. The Licencee shall keep for inspection, records of the details of all incidents requiring the implementation of the contingency action plan of the Development, at the Development site office.

Closure and Post Closure

54. The Licencee shall submit, within six months of the date of issuance of this Licence, for the approval of the Director, a preliminary Closure and Post Closure Plan for the Development. The plan shall address the closure of the existing soil recycling facility and shall include, but not be limited to, information with respect to the following:
 - a) soil and ground water analyses for petroleum products or by-products, including diesel fuel;
 - b) removal of all ancillary equipment associated with the Development; and
 - c) restoration of the site to the satisfaction of the Director.
55. The Licencee shall submit, for the approval of the Director, not less than one year prior to closure of the Development, an updated Closure and Post Closure Plan for the Development.
56. The Licencee shall implement and maintain the approved Closure and Post Closure Plan for the Development as approved by the Director.

Financial Assurance/Insurance

57. The Licencee shall prepare, within 6 months of the date of this Licence, a remediation and closure plan assessment, satisfactory to the Director, that includes, but is not limited to, the following:
 - a) estimated cost to assess the impacts of the Facility to soil and groundwater;
 - b) estimated cost to remediate impacts of the Facility identified in the assessment referred to in Clause 57 (a); and
 - c) estimated cost to decommission the Facility.
58. The Licencee shall maintain and post with Manitoba Sustainable Development, in the amount determined in Clause 57 of this Licence:
 - a) a permit bond issued by a surety company licenced to do business in the Province of Manitoba;
 - b) an irrevocable letter of credit; or
 - c) another acceptable security satisfactory to the Director.
59. The Permit bond, irrevocable letter of credit, or other security and renewals thereof, referenced in Clause 58 of this Licence, shall remain in place for the duration of the operation and decommissioning of the Facility. The Director may order forfeiture of the permit bond, irrevocable letter of credit, or other security, either in whole or in

part, by giving written notice to that effect to the Licencee, upon the Director being satisfied that the Licencee is in breach of any specification, limit, term or condition of this Licence, or for reimbursement of any costs or expenses incurred by the Province of Manitoba in rectifying environmental damage caused or contributed to by the operation of the Facility.

60. The Licencee shall, every 5 years or more frequently at the Licencee's preference or the request of the Director, carry out a review of the assessment completed pursuant to Clause 57 of this licence and accordingly update the amount of the permit bond, irrevocable letter or credit or other security required by Clause 58 of this licence.
61. The Licencee shall maintain valid Environmental Impairment Liability insurance providing coverage subject to a minimum limit of \$1,000,000 Cdn per occurrence or claim, including coverage for gradual, and sudden and accidental pollution. Coverage to include on-site and off-site clean up costs, and be placed with insurers satisfactory to the Province of Manitoba. The Province of Manitoba is to be added as an Additional Insured on the policy. The policy shall contain a clause stating that the Insurer will give Manitoba 60 days prior written notice in case of a reduction in coverage or policy cancellation.

REVIEW AND REVOCATION

- A. This Licence replaces Licence No. 3014 R which is hereby rescinded.
- B. If, in the opinion of the Director, the Licencee has exceeded or is exceeding or has failed or is failing to meet the specifications, limits, terms, or conditions set out in this Licence, the Director may, temporarily or permanently, revoke this Licence.
- C. If, in the opinion of the Director, new evidence warrants a change in the specifications, limits, terms or conditions of this Licence, the Director may require the filing of a new proposal pursuant to Section 10 of The Environment Act.



Siobhan Burland Ross, M.Eng., P.Eng.
Director
The Environment Act

TABLE 1
TO ENVIRONMENT ACT LICENCE NO. 3014 RR

COMPREHENSIVE WATER QUALITY CHEMICAL
AND MICROBIOLOGICAL PARAMETERS

Parameter	Notes
Alkalinity-bicarbonate	Dissolved
Alkalinity-carbonate	Dissolved
Alkalinity-hydroxide	Dissolved
Alkalinity-total	Dissolved
Hardness- as CaCO ₃	Dissolved
pH-units	
Specific Conductivity	Dissolved
Turbidity-NTU	
Residue-filterable	
Residue-non filterable	
Residue-total	
Chloride	Dissolved
Sulphate	Dissolved
Cyanide-total	Dissolved
Ammonia	Dissolved
Nitrate-Nitrite-Nitrogen	Dissolved
Total Kjeldhal Nitrogen	
Phosphorus	Dissolved
Arsenic	Dissolved
Barium	Dissolved
Beryllium	Dissolved
Cadmium	Dissolved
Calcium	Dissolved
Chromium	Dissolved
Copper	Dissolved
Iron	Dissolved
Lead	Dissolved

TABLE 1 (cont'd.)
TO ENVIRONMENT ACT LICENCE NO. 3014 RR

COMPREHENSIVE WATER QUALITY CHEMICAL
AND MICROBIOLOGICAL PARAMETERS

Parameter	Notes
Magnesium	Dissolved
Manganese	Dissolved
Mercury	Extractable
Nickel	Dissolved
Potassium	Dissolved
Selenium	Dissolved
Silver	Dissolved
Sodium	Dissolved
Zinc	Dissolved
Naphthalene	
Benzo a pyrene	
Anthracene	
CCME Petroleum Hydrocarbon Fraction 1	
CCME Petroleum Hydrocarbon Fraction 2	
CCME Petroleum Hydrocarbon Fraction 3	
CCME Petroleum Hydrocarbon Fraction 4	
Benzene	
Ethylbenzene	
Toluene	
Xylene	
Vinyl Chloride	
Diazinon	
2, 4-Dichlorophenoxyacetic acid (2, 4-D)	
Coliforms	Fecal & Total

SCHEDULE "A"
TO ENVIRONMENT ACT LICENCE NO. 3014 RR

Soil Sampling:

1. The Licencee shall provide a drilling rig, acceptable to the designated Environment Officer, to extract soil samples from the specified liner of the structure. This includes all liners constructed with clay. The drill rig shall have the capacity to drill to the maximum depth of the clay liner plus an additional 2 metres. The drill rig shall be equipped with both standard and hollow stem augers. The minimum hole diameter shall be 5 inches.
2. For liners placed or found at the surface of the structure, the Licencee shall provide a machine, acceptable to the designated Environment Officer, capable of pressing a sampling tube into the liner in a straight line motion along the centre axis line of the sample tube and without sideways movement.
3. Soil samples shall be collected and shipped in accordance with ASTM Standard D 1587 (Standard Practice for Thin-Walled Tube Sampling of Soils), D 4220 (Standard Practice for Preserving and Transporting Soil Samples) and D 3550 (Standard Practice for Ring-Lines Barrel Sampling of Soils). Thin-walled tubes shall meet the stated requirements including length, inside clearance ratio and corrosion protection. An adequate venting area shall be provided through the sampling head.
4. At the time of sample collection, the designated Environment Officer shall advise the Licencee as to the soil testing method that must be used on each sample. The oedometer method may be used for a sample were the Environment Officer determines that the soil sample is taken from an undisturbed clay soil which has not been remoulded and which is homogeneous and unweathered. The triaxial test shall be used for all samples taken from disturbed and remoulded soils or from non homogenous and weathered soils.
5. The Licencee shall provide a report on the collection of soil samples to the designated Environment Officer and to the laboratory technician which includes but is not limited to the following: a plot plan indicating sample location, depth or elevation of sample, length of advance of the sample tube length of soil sample contained in the tube after its advancement, the soil test method specified by the Environment Officer for each soil sample and all necessary instructions from the site engineer to the laboratory technician.
6. All drill and sample holes shall be sealed with bentonite pellets after the field drilling and sampling has been completed.

SCHEDULE "A" (cont'd)
TO ENVIRONMENT ACT LICENCE NO. 3014 RR

Soil Testing Methods:

1. Triaxial Test Method
 - a) The soil samples shall be tested for hydraulic conductivity using ASTM D 5084 (Standard Test Method for Measurement of Hydraulic Conductivity of Saturated Porous Materials Using a Flexible Wall Permeameter).
 - b) Soil specimens shall have a minimum diameter of 70 mm (2.75 inches) and a minimum height of 70 mm (2.75 inches). The soil specimens shall be selected from a section of the soil sample which contains the most porous material based on a visual inspection. The hydraulic gradient shall not exceed 30 during sample preparation and testing. Swelling of the soil specimen should be controlled to adjust for the amount of compaction measured during sample collection and extraction from the tube and the depth or elevation of the sample. The effective stress used during saturation or consolidation of the sample shall not exceed 40 kPa (5.7 psi) or the specific stress level that is expected in the field location where the sample was taken, whichever is greater.
 - c) The complete laboratory report, as outlined in ASTM D 5084, shall be supplied for each soil sample collected in the field.
2. Oedometer Test Method
 - a) The soil samples shall be tested for hydraulic conductivity using ASTM D 2435 (Standard Test Method for One-Dimensional Consolidation Properties of Soils).
 - b) Soil specimens shall have a minimum diameter of 50 mm (2 inches) and a minimum height of 20 mm (0.8 inches). The soil specimens shall be selected from a section of the soil sample which contains the most porous material based on a visual inspection. The soil specimen shall be taken from an undisturbed soil sample. The soil specimen shall be completely saturated.
 - c) The complete laboratory report, as outlined in ASTM D 2435, shall be supplied for each soil sample collected in the field.