

# Environment Act Licence

## Loi sur l'environnement Licence

Manitoba  
Conservation  
Conservation  
Manitoba



Licence No./Licence n° 2699  
Issue Date/Date de délivrance June 21, 2006

IN ACCORDANCE WITH THE ENVIRONMENT ACT (C.C.S.M. c. E125)  
THIS LICENCE IS ISSUED PURSUANT TO SECTION 12(1) TO:

### WUSKWATIM POWER LIMITED PARTNERSHIP; "the Licencee"

for the Development being the Wuskwatim Generating Station located on the Burntwood River at Taskinigup Falls at the outlet of Wuskwatim Lake, approximately 45 km southwest of Thompson and 35 km southeast of Nelson House, and within the Nelson House Resource Management Area. The Development involves the construction, operation and maintenance of the Wuskwatim Generating Station, and related dams, dikes, channels, control structures and infrastructure, including roads, in accordance with the Proposal and the Environmental Impact Statement (EIS) filed under The Environment Act in April 2003, in consideration of the September 2004 Clean Environment Commission Report on Public Hearings, and subject to the following specifications, limits, terms and conditions:

### DEFINITIONS

In this Licence:

“**Department**” means Manitoba Conservation;

“**Director**” means an employee of the department so designated pursuant to The Environment Act;

“**Environment Officer**” means an employee of the department appointed as such by the Minister; and

“**Minister**” means the minister of the Department.

**\*\*A COPY OF THE LICENCE MUST BE KEPT ON SITE AT THE DEVELOPMENT AT ALL TIMES\*\***



### GENERAL TERMS AND CONDITIONS

This Section of the Licence contains requirements intended to provide guidance to the Licencee in implementing practices to ensure that the environment is maintained in such a manner as to sustain a high quality of life, including social and economic development, recreation and leisure for present and future Manitobans.

1. The Licencee shall locate fuel storage and equipment servicing areas established for the construction and operation of the Development at a minimum distance of 100 meters from any waterbody, and operate the fuel storage areas in compliance with the requirements of *Manitoba Regulation 188/2001* respecting *Storage and Handling of Petroleum Products and Allied Products*.
2. The Licencee shall, at all times during the construction of the Development, have materials available at the construction sites to contain and recover spills of fuel and other fluids associated with construction machinery.
3. The Licencee shall ensure that non-reusable demolition and construction debris from the Development is disposed of at a waste disposal ground operating under the authority of a permit, pursuant to the *Waste Disposal Ground Regulation, MR 150/91*, or an *Environment Act Licence pursuant to The Environment Act*.
4. The Licencee shall, during construction, dispose of all sewage from on-site sanitary facilities in accordance with the *Onsite Wastewater Management Systems Regulation, MR 83/2003*.
5. The Licencee shall during construction and operation of the Development:
  - a) immediately report any reportable spills to Manitoba Conservation's Accident Reporting Line at (204) 944-4888, and
  - b) at the request of the Director, provide a follow-up report to the Director on a reportable environmental accident outlining the cause(s) and propose corrective action to prevent reoccurrence.
6. The Licencee shall, during construction, adhere to the general recommendations contained in the Department guidelines titled *Manitoba Stream Crossing Guidelines for the Protection of Fish and Fish Habitat, 1996*.
7. The Licencee shall, prior to commencing construction of the Development, obtain Work Permits from the appropriate Department Regional office.
8. The Licencee shall, prior to construction, obtain all permits and agreements as required by Manitoba Transportation and Government Services.
9. The Licencee shall, prior to construction, provide a copy of this Environment Act Licence to the contractor and subcontractor(s) involved in the Development and



require that the contractor and subcontractor(s) comply with the requirements of this Licence.

10. The Licencee shall, prior to construction of the Development, prepare access management plans in consultation with the Nelson House Resource Management Board and communities in which new facilities will be located or those where there are expected to be discernable project related changes to the physical environment.
11. Nothing in this Licence shall be construed as negating or in anyway whatsoever altering the obligation of the Licencee to operate the Development in accordance with all existing Licences and agreements for the Churchill-Burntwood River waterway, the Lake Winnipeg Regulation and the Manitoba Water Power Licence.

#### **SPECIFICATIONS, LIMITS, TERMS AND CONDITIONS**

12. The Licencee shall consider the elements outlined in Manitoba Clean Environment Commission Recommendation 7.1 B, and prior to commencement of construction activities for the Development, submit to the Director for approval, a Wuskwatim Generating Station Environmental Protection Plan (EPP). If appropriate, separate EPPs can be submitted for the construction and operation phases, as well as for different components of the project, if prior approval by the Director is obtained. The EPP shall describe the approach to be used by the Licencee to monitor environmental conditions during the construction and operation of the Generation Station's components to ensure that mitigative measures are applied systematically, and in a manner consistent with the commitments made in the Wuskwatim Generating Station Environmental Impact Statement (EIS). Specifically, the EPP shall:
  - a) describe the protocol for reporting on monitoring and compliance for the construction and operational phases of the project;
  - b) contain the project-specific environmental protection measures referenced in the EIS, and all additional measures identified and agreed to by the Licencee following the filing of the EIS; and
  - c) address issues and concerns identified by individuals representative of resource user communities in which new facilities will be located or those where there are expected to be discernable project related changes to the physical environment.
13. The Licencee shall, within six months of the date of issuance of this Licence, initiate and facilitate discussions with representatives of the Department, the Government of Canada, where appropriate, individuals representative of resource user communities in which new facilities will be located or those where there are expected to be discernable project related changes to the physical environment, to establish baseline monitoring and ecosystem research programs to:



- a) protect vulnerable, threatened or endangered species or ecosystems; threatened or sensitive habitats; and protected areas with particular consideration of woodland caribou; and
  - b) to assess the accuracy of predicted project related impacts within the designated study area.
14. The Licencee shall establish an ongoing advisory committee comprised of representatives of the Department, the Government of Canada and individuals representative of resource user communities in which new facilities will be located or those where there are expected to be discernable project related changes to the physical environment, for the purpose of providing guidance on the research and monitoring activities described in Clause 13 of this Licence related to potential project effects on woodland caribou and, where appropriate, to apply adaptive management measures. The committee shall coordinate its activities with the advisory committee established pursuant to Environment Act Licence No. 2700 for the purpose of modifying project research and monitoring activities in relation to other regional developments, as required.
15. The Licencee shall provide data collected in the course of monitoring or research activities pursuant to Clause 13 of this Licence, to the Governments of Manitoba and Canada, and others as requested.
16. The Licencee shall, within one year of the date of issuance of this Licence, prepare for the approval of the Director, a report on monitoring programs to be undertaken in connection with the EPP. The report shall:
  - a) provide a description of the proposed activities including the use of traditional knowledge for monitoring effects to the physical, aquatic, terrestrial, and socio-economic environments (including the evolving baseline conditions) arising from the site preparation, construction, and operation of the Wuskwatim Generating Station Project; and
  - b) describe the equipment to be used, the parameters to be measured, the methodology and frequency of measurement, references to established thresholds and sustainability indicators, where appropriate, and the protocol for reporting the results of monitoring of the environmental conditions affected by the Wuskwatim Generation Project.
17. The Licencee shall report annually to the Director on the results of monitoring programs in connection with the EPP, as approved pursuant to Clause 16 of this Licence.
18. The Licencee shall, within one year of the date of issuance of this Licence, develop a multi-year monitoring program, for review and approval by the Director, for measuring rates of shoreline erosion at representative sites on Wuskwatim Lake, and along potentially-affected downstream reaches of the Burntwood River. Results from the approved monitoring program shall be reported on an annual basis to the Director.



19. The Licencee shall, within one year of the date of issuance of this Licence, develop a monitoring program, for approval by the Director, for monitoring sediment concentrations and their downstream transport in the Burntwood River during construction, and their related effects on water quality. Results from the approved monitoring program shall be reported on an annual basis to the Director.
20. The Licencee shall develop a multi-year monitoring program, for approval by the Director, for monitoring fish production and fish harvesting in Wuskwatim Lake. Results from the approved monitoring program shall be reported on an annual basis to the Director.
21. The Licencee shall during the construction and operation of the Development comply with the following Plans and Authorization submitted to/issued by the Department of Fisheries and Oceans Canada:
  - a) Fish Habitat Compensation Plan;
  - b) Aquatic Effects Monitoring Plan;
  - c) Sediment Management Plan; and
  - d) Authorization for Works or Undertakings Affecting Fish Habitat.
22. The Licencee shall during construction in riparian areas associated with the Development:
  - a) maintain a minimum 30 meter buffer zone extending from stream bank shorelines to the top of stream banks. Trees within the buffer zone shall be cleared by hand and all existing low growth vegetation such as grasses, shrubs, and willows shall be maintained on site;
  - b) establish buffers in accordance with practices set out in:
    - i) *Forest Management Guidelines for Wildlife in Manitoba*;
    - ii) *Manitoba Stream Crossing Guidelines for the Protection of Fish and Fish Habitat*;
    - iii) *Timber Harvesting Practices for Forestry Operations in Manitoba*;
    - iv) *Consolidated Buffer Management Guidelines*; and
    - v) any other relevant provincial guidelines;
  - c) design and/or modify buffers, in consultation with the Department, to ensure post-clearing runoff does not negatively affect sediment loads in local waterbodies;
  - d) minimize in-stream construction time to reduce sedimentation;
  - e) avoid use of organic soil, silt, or clay in temporary winter stream crossings;
  - f) remove all materials used in the construction of ice bridges from the water course or waterbody prior to spring ice breakup;
  - g) locate any temporary marshalling yards and storage sites required for the Development at a minimum distance of 100 meters from any wetland or watercourse; and
  - h) implement and monitor any additional on-site details and mitigative measures recommended for sensitive areas, as identified in the approved Wuskwatim Generation Station Project Environmental Protection Plan.



23. The Licencee shall construct and operate the interim and start-up camps wastewater collection and holding tank system and the temporary wastewater holding cell and the main camp wastewater collection system and wastewater treatment lagoon in accordance with the document entitled Wuskwatim Generating Station Construction Camps Functional Report for Water, Sewage and Solid Waste, filed under The Environment Act, dated September 2004, and in accordance with the specifications, limits, terms and conditions prescribed under Schedules A and A 1 of this Licence.
24. The Licencee shall, during construction and operation of the Development, use mechanical or hand clearing methods to control vegetation to the maximum extent possible. Any chemical vegetation control shall require approval by an Environment Officer, and the Licencee shall:
  - a) maintain a buffer near wetlands and waterbodies of 30 meters for application of herbicides; and
  - b) adhere to *Manitoba Regulation 47/2004* respecting pesticides.
25. The Licencee shall, where practical, set aside cleared vegetation which can be salvaged for local individual or community use as firewood. Cleared vegetation shall be disposed of in accordance with Department requirements.
26. The Licencee shall, during construction minimize erosion to the extent possible, and at the completion of the construction of the Development, stabilize and vegetate all erosion-prone areas where the soil has been disturbed by construction. Erosion prone areas shall be monitored following construction to ensure stabilization procedures are effective.
27. The Licencee shall, during construction and operation of the Development, post appropriate warning signage to advise recreational traffic of construction activity, the presence of structures and water conditions.
28. The Licencee shall, during construction and operation of the Development apply measures determined through discussion and consultation with the Department, to protect:
  - a) vulnerable, threatened, or endangered species or ecosystems;
  - b) threatened or sensitive habitats;
  - c) protected areas;
  - d) waterfowl and furbearers;
  - e) medicinal plants; and
  - f) areas of wild rice production
29. The Licencee shall, during construction and operation of the Development, apply measures to protect heritage resources, as directed by the Historic Resources Branch of Manitoba Culture, Heritage and Citizenship.




30. The Licencee shall operate the Development within the following parameters:
  - a) maintain the mean daily water level on Wuskwatim Lake (wind and wave effects eliminated) between 233.75 meters and 234.0 meters Above Sea Level (ASL), as determined by measurements from a minimum of three water level monitoring stations on Wuskwatim Lake;
  - b) maintain mean daily water levels on Birchtree Lake such that the daily water level variations shall be less than 0.10 meters and 0.15 meters in open water and winter conditions (wind and wave effects eliminated) respectively. Any exceptions to these fluctuations shall be reported within one week to Manitoba Water Stewardship;
  - c) determine water levels on Birchtree Lake through measurements at a minimum of two water level stations; and
  - d) base elevations on the Geodetic Survey of Canada (GS of C), Canadian Government Vertical Datum (CGVD) 1928, 1971 Local Adjustment (also referred to as GS of C CGVD28, 1969 Local Adjustment).
31. The Licencee shall receive approval from Manitoba Water Stewardship with respect to the number and location of all water level monitoring stations, averaging techniques and reporting protocols.
32. Notwithstanding Clause 30 a) of this Licence, the Licencee shall report to Manitoba Water Stewardship, any conditions which may require an exceedance of the mean daily elevation above 234.0 meters ASL and below 233.75 meters ASL on Wuskwatim Lake. Subject to Ministerial authorization pursuant to The Water Power Act, draw downs on Wuskwatim Lake below 233.00 meters ASL shall be allowed during exceptional conditions. Explanations shall be provided for the exceptional conditions, including the magnitude of associated water level changes.
33. The Licencee shall report, to Manitoba Water Stewardship, on a monthly and annual basis, the water levels monitored pursuant to Clauses 30 a) and c) of this Licence including other relevant station and related system operating characteristics. These reports shall also be provided to the Nelson House Resource Management Board, all communities on the Manitoba Hydro Churchill River Diversion Augmented Flow Program notification list and posted on the Manitoba Hydro web site.
34. The Licencee shall at the commencement of the operation of the Development and for a period of five years, unless otherwise directed by the Minister, monitor daily water level variations and the frequency and magnitude of exceedances for the purpose of confirming the appropriateness of the parameters prescribed in Clause 30 of this Licence or the need for adjustments to reflect local hydrological conditions.



**LICENCE REVIEW AND REVOCATION**

- A. If in the opinion of the Minister, the Licencee has exceeded or is exceeding or has or is failing to meet the specifications, limits, terms, or conditions set out in this Licence, the Minister may, temporarily or permanently, revoke this Licence.
- B. If in the opinion of the Minister, new evidence warrants a change in the specifications, limits, terms, or conditions of this Licence, the Minister may require the Licencee to file a new proposal pursuant to Section 12 of The Environment Act.
- C. If construction of the Development has not commenced within five years of the date of this Licence, the Licence is revoked.

  
Stan Struthers  
Minister  
Environment Act

File: 4724.00



## SCHEDULE A TO ENVIRONMENT ACT LICENCE NO: 2699

### DEFINITIONS

"**accredited laboratory**" means an analytical facility accredited by the Standard Council of Canada (SCC), or accredited by another accrediting agency recognized by Manitoba Conservation 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;

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

"**appurtenances**" means machinery, appliances, or auxiliary structures attached to a main structure to enable it to function, but not considered an integral part of it;

"**as constructed drawings**" means engineering drawings complete with all dimensions which indicate all features of the Development as it has actually been built;

"**ASTM**" means the American Society for Testing and Materials;

"**bentonite**" means specially formulated standard mill grade sodium bentonite conforming to American Petroleum Institute Specification 13-A;

"**cut-off**" means a vertical-side trench filled with compacted clay or a wall constructed from compacted clay;

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

"**effluent**" means treated wastewater flowing or pumped out of the wastewater treatment lagoon;

"**fecal coliform**" means aerobic and facultative, gram-negative, nonspore-forming, rod-shaped bacteria capable of growth at 44.5 °C, and associated with fecal matter of warm-blooded animals;

"**five-day biochemical oxygen demand**" means that part of the oxygen demand usually associated with biochemical oxidation of organic matter within 5 days at a temperature of 20°C;



**"flooding"** means the flowing of water onto lands, other than waterways, due to the overtopping of a waterway or waterways;

**"high water mark"** means the line on the interior surface of the primary and secondary cells which is normally reached when the cell is at the maximum allowable liquid level or the line of the exterior of the perimeter dykes which is reached during local flooding;

**"hydraulic conductivity"** means the quantity of water that will flow through a unit cross-sectional area of a porous material per unit of time under a hydraulic gradient of 1.0;

**"influent"** means water, wastewater, or other liquid flowing into a wastewater treatment facility;

**"in-situ"** means on the site;

**"low water mark"** means the line on the interior surface of the primary and secondary cells which is normally reached when the cell is discharged;

**"MPN Index"** means the most probable number of coliform organisms in a given volume of wastewater which, in accordance with statistical theory, would yield the observed test result with the greatest frequency;

**"primary cell"** means the first in a series of cells of the wastewater treatment lagoon system and which is the cell that receives the untreated wastewater;

**"rip rap"** means small, broken stones or boulders placed compactly or irregularly on dykes or similar embankments for protection of earth surfaces against wave action or current;

**"secondary cell"** means a cell of the wastewater treatment lagoon system which is the cell that receives partially treated wastewater from the primary cell;

**"septage"** means the sludge produced in individual on-site wastewater disposal systems such as septic tanks;

**"sludge solids"** means solids in sludge;

**"sludge"** means accumulated solid material containing large amounts of entrained water, which has separated from wastewater during processing;

**"split wedge weld"** means two welded tracks with an unbonded channel between them that is sealed at both ends and pressurized with air at completion;

**"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 Waterworks Association and the Water Environment Federation;



**"temporary wastewater holding cell"** means the impoundment into which wastewater is discharged for temporary storage;

**"total coliform"** means a group of aerobic and facultative anaerobic, Gram-negative, nonspore-forming, rod-shaped bacteria, that ferment lactose with gas and acid formation within 48 hours at 35 °C, and inhabit predominantly the intestines of man or animals, but are occasionally found elsewhere and include the sub-group of fecal coliform bacteria;

**"wastewater"** means the spent or used water of a community or industry which contains dissolved and suspended matter;

**"wastewater collection system"** means the sewer and pumping system used for the collection and conveyance of domestic, commercial and industrial wastewater; and

**"wastewater treatment lagoon"** means an impoundment into which wastewater is discharged for storage and treatment by natural oxidation.

#### GENERAL TERMS AND CONDITIONS

1. The Licencee shall direct all wastewater generated within the road, interim, start-up and main camps toward the temporary wastewater holding cell or the main camp wastewater treatment lagoon at the Development or other approved wastewater treatment facilities.
2. In addition to any of the limits, terms and conditions specified in this Schedule, 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 Development; or
  - c) 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.



3. The Licencee shall, unless otherwise specified in this Schedule:
  - a) carry out all preservations and analyses on liquid samples in accordance with the methods prescribed in "Standard Methods for the Examination of Water and Wastewater" or in accordance with an equivalent analytical methodology approved by the Director;
  - b) have all analytical determinations undertaken by an accredited laboratory; and
  - c) report the results to the Director, in writing or in a format acceptable to the Director, within 60 days of the samples being taken.
4. The Licencee shall operate and maintain the temporary wastewater holding cell and the wastewater treatment lagoon in such a manner that the release of offensive odours is minimized.

#### **SPECIFICATIONS, LIMITS, TERMS AND CONDITIONS**

5. The Licencee shall notify the assigned Environment Officer not less than two weeks prior to beginning construction of the temporary wastewater holding cell and the wastewater treatment lagoon. The notifications shall include the intended starting dates of construction.
6. The Licencee shall construct and maintain all-weather access roads and wastewater dumping stations for truck handled wastewater delivery at the temporary wastewater holding cell and the wastewater treatment lagoon. Each dumping facility shall have a surface splash ramp with a smooth hard surface that can be easily washed free of solids.

#### **Respecting the Temporary Wastewater Holding Cell:**

7. The Licencee shall construct and maintain a continuous liner underlying the temporary wastewater holding cell, such that:
  - a) the liner is constructed from polyolefin geomembrane;
  - b) the liner has a minimum thickness of 40 mils;
  - c) all sections of the liner are joined by fusion seaming using split wedge welds;
  - d) the liner is installed to a minimum elevation of 2.5 meters above the base of the cell;
  - e) the liner is underlain by geotextile fabric, sand bedding and an appropriately prepared sub grade; and
  - f) the liner is secured to prevent lifting of the liner.
8. The Licencee shall have the integrity of all field seams tested in accordance with ASTM Standard D-4437 by an independent testing service that was not involved with the supply or installation of the liner and is not the operator of the temporary wastewater holding cell. Non-destructive test methods, including air pressure testing, shall be used and a testing report prepared and submitted to the Director within 30 days of commencing the installation of the liner.



9. The Licencee shall operate and maintain the temporary wastewater holding cell in such a manner that the depth of liquid in the cell does not exceed 1.5 meters.
10. The Licencee shall not discharge effluent from the temporary wastewater holding cell except to approved wastewater treatment facilities.
11. The Licencee shall provide exit ramps from the bottom of the temporary wastewater holding cell to the tops of the dykes.

**Respecting the Wastewater Treatment Lagoon:**

12. The Licencee shall satisfy the construction requirements for the wastewater treatment lagoon prior to operation.
13. The Licencee shall, prior to the construction of the dykes for the wastewater treatment lagoon:
  - a) remove all organic topsoil from the area where the dykes will be constructed; or
  - b) remove all organic material for a depth of 0.3 meters and a width of 3.0 meters from the area where the liner will be constructed.
14. The Licencee shall operate and maintain the wastewater treatment lagoon in such a manner that:
  - a) the organic loading on the primary cell of the wastewater treatment lagoon, as indicated by the five-day biochemical oxygen demand, is not in excess of 56 kilograms per hectare per day; and
  - b) the depth of liquid in any cell does not exceed 1.5 meters.
15. The Licencee shall construct and maintain the cells of the wastewater treatment lagoon with continuous liners, including cutoffs, under all interior surfaces of the cells in accordance with the following specifications:
  - a) the liners shall be made of clay;
  - b) the liners shall be at least one meter in thickness;
  - c) the liners shall have a hydraulic conductivity of  $1 \times 10^{-7}$  centimeters per second or less at all locations; and
  - d) the liners shall be constructed to an elevation of 2.5 meters above the floor elevation of the primary cell and of the secondary cell.
16. The Licencee shall install and maintain a fence around the wastewater treatment lagoon to limit access. The fence shall be a minimum of 1.2 meters high and have a locking gate, which shall be locked at all times except to allow access to the wastewater treatment lagoon.



17. The Licencee shall, if in the opinion of the Director, significant erosion of the interior surfaces of the dykes occurs, repair the dyke and install rip rap as necessary. The rip rap shall be placed on the interior dyke surfaces from 0.6 meters above the high water mark to at least 0.6 meters below the low water mark to protect the dykes from wave action.
18. The Licencee shall provide and maintain a grass cover on the dykes of the wastewater treatment lagoon and shall regulate the growth of the vegetation so that the height of the vegetation does not exceed 0.3 meters on all dykes.
19. The Licencee shall annually remove by mechanical methods all reeds, rushes and trees located above the low water mark in every cell of the wastewater treatment lagoon.
20. The Licencee shall implement an ongoing program to remove burrowing animals from the site of the wastewater treatment lagoon.
21. The Licencee shall not discharge effluent from the wastewater treatment lagoon:
  - a) except by ditch to the Burntwood River;
  - b) where the organic content of the effluent, as indicated by the five day biochemical oxygen demand, is in excess of 30 milligrams per liter;
  - c) where the fecal coliform content of the effluent, as indicated by the MPN index, is in excess of 200 per 100 milliliters of sample;
  - d) where the total coliform content of the effluent, as indicated by the MPN index, is in excess of 1500 per 100 milliliters of sample;
  - e) between the 1st day of November of any year and the 15th day of June of the following year;
  - f) when flooding from any cause is occurring along the effluent drainage route; or
  - g) when such a discharge would cause or contribute to flooding in or along the effluent drainage route.

#### **MONITORING AND REPORTING**

22. The Licencee shall, in case of physical or mechanical breakdown of the wastewater collection, holding and/or treatment system:
  - a) notify the Director immediately;
  - b) identify the repairs required to the wastewater collection, holding and/or treatment system;
  - c) undertake all repairs to minimize unauthorized discharges of wastewater; and
  - d) complete the repairs in accordance with any written instructions of the Director.



**Respecting the Temporary Wastewater Holding Cell:**

23. The Licencee shall notify the Director one week prior to commencing the installation of the liner of the temporary wastewater holding cell.
24. The Licencee shall not use the temporary wastewater holding cell until receiving the approval of the Minister of the report submitted pursuant to Clause 8 of this Schedule.

**Respecting the Wastewater Treatment Lagoon:**

25. The Licencee shall prior to each effluent discharge campaign from the wastewater treatment lagoon obtain grab samples of the treated wastewater and have them analyzed for:
  - a) the organic content as indicated by the five day biochemical oxygen demand and expressed as milligrams per liter;
  - b) the fecal coliform content as indicated by the MPN index and expressed as MPN per 100 milliliters per sample; and
  - c) the total coliform content as indicated by the MPN index and expressed as MPN per 100 milliliters per sample.
26. The Licencee shall:
  - a) during each year maintain records of:
    - i) wastewater sample dates;
    - ii) original copies of laboratory analytical results of the sampled wastewater;
    - iii) effluent discharge dates;
  - b) make the records being maintained pursuant to sub-Clause 26 a) of this Schedule available to an Environment Officer upon request; and
  - c) keep the maintained records of any one calendar year available for inspection for a period of three years following the respective calendar year in which they were recorded.
27. The Licencee shall arrange with the designated Environment Officer a mutually acceptable time and date for any required soil sampling between the 15th day of May and the 15th day of October of any year.
28. The Licencee shall take and test undisturbed soil samples, in accordance with Schedule A 1 attached to this Schedule, from the liner of the wastewater treatment lagoon; the number and location of samples and test methods to be specified by the designated Environment Officer up to a maximum of 20 samples.
29. The Licencee shall, prior to operating the wastewater treatment lagoon, submit to the Director the results of the tests carried out pursuant to Clause 28 of Schedule A.



30. The Licencee shall, at completion of construction:
- a) prepare "as constructed drawings" for the temporary wastewater holding cell and the wastewater treatment lagoon and shall label the drawings "As Constructed";
  - b) provide to the Director, two sets of "as constructed drawings" of the temporary wastewater holding cell; and
  - c) provide to the Director, two sets of "as constructed drawings" of the wastewater treatment lagoon.

### DECOMMISSIONING

#### Respecting the Temporary Wastewater Holding Cell:

31. The Licencee shall, after placing the wastewater treatment lagoon into operation, prevent any additional wastewater from being discharged into the temporary wastewater holding cell.
32. The Licencee shall decommission the temporary wastewater holding cell within 90 days of commencing operation of the wastewater treatment lagoon.
33. The Licencee shall decommission the temporary wastewater holding cell in accordance with the following:
- a) transfer the effluent and sludge from the temporary wastewater holding cell to the wastewater treatment lagoon;
  - b) remove all components of the liner and all ancillary components;
  - c) dispose of all components of the liner and all ancillary components;
    - i) at a waste disposal ground operated under the authority of a permit issued under Manitoba Regulation 150/91 or a Licence issued pursuant to The Environment Act; or
    - ii) by other means approved by the Minister; and
  - d) level the site to the original grade and return the area to its natural state.

#### Respecting the Wastewater Treatment Lagoon:

34. The Licencee shall submit, within one year prior to closure of the Main Camp, a wastewater treatment lagoon decommissioning plan for the approval of the Minister.
35. The Licencee shall implement and maintain the approved decommissioning plan for the wastewater treatment lagoon.



## SCHEDULE A 1 TO ENVIRONMENT ACT LICENCE NO: 2699

### Soil Sampling:

1. The Licencee shall provide a drilling rig, acceptable to the designated Environment Officer, to extract soil samples from the liner which is not placed or found at the surface of the lagoon structure. This includes all wastewater treatment lagoons constructed with clay cutoffs at the interior base of the dyke or with a clay cutoff in the centre of the dyke. The drill rig shall have the capacity to drill to the maximum depth of the clay cutoff plus an additional 2 meters. The drill rig shall be equipped with both standard and hollow stem augers. The minimum hole diameter shall be 5 inches.
2. For lagoon liners placed or found at the surface of the lagoon 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: 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.



## 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.