

Licence No.: 2216

Licence Issued: August 26, 1996

In accordance with the Manitoba Environment Act (C.C.S.M. c. E125)

THIS LICENCE IS ISSUED TO:

LOCAL GOVERNMENT DISTRICT OF GRAHAMDALE; "The Licence"

for the construction and operation of the Development being a wastewater treatment lagoon located in the southwest quarter of Section 30, Township 26, Range 7 WPM in the Local Government District of Grahamdale and with discharge of treated effluent to Watchorn Creek, in accordance with the Proposal filed under The Environment Act on December 19, 1995, and Letter dated June 12, 1996, and subject to the following specifications, limits, terms and conditions:

DEFINITIONS

In this Licence,

"**affected area**" means a geographical area affected by an odour nuisance;

"**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 or sewage treatment plant;

"**fecal coliform**" means aerobic and facultative, Gram-negative, nonspore-forming, rod-shaped bacteria capable of growth at 44.5 degrees Celsius, 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 five days at a temperature of 20 degrees Celsius;

"**flooding**" means the flowing of liquid onto lands, other than waterways or drains, due to the overtopping of a waterway or designated municipal or provincial drain;

"**hailed waste**" means septage and wastewater conveyed to the development via pumpout truck;

"**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;

"**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;

"in-situ" means on the site;

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

"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;

"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 the affected area; or
- c. present at a location in the affected area which is normally open to the members of the public;

if the odour, smell or aroma

- d. is the subject of at least 5 written complaints in a form satisfactory to the Director and from 5 different persons falling within clauses (a), (b) or (c), who do not live in the same household, received by the Director within a 90 day period; or
- e. is the subject of at least one written complaint 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 from 5 different persons and who do not live in the same household within a 90 day period.

"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;

"riprap" 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;

"sewage" means household and commercial wastewater that contains human waste;

"sewerage system" means a system of pipes, with appurtenances, for collecting and conveying wastewater from source to the treatment facility;

"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 degrees Celsius, 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 an individual residence, community or industry which contains dissolved and suspended matter; and

"wastewater treatment lagoon" means the component of this development which consists of an impoundment into which wastewater is discharged for storage and treatment by natural oxidation.

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 direct all sewage generated within the Community of Moosehorn into the wastewater treatment lagoon or other approved sewage treatment facilities.
2. Notwithstanding any of the following specifications, limits, terms and 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, handling, treatment, and disposal systems, for such pollutants, ambient quality, aquatic toxicity, seepage characteristics and discharge rates, and for such duration and frequencies as may be specified; and/or
 - b. determine the environmental impact associated with the release of any pollutants from the Development; and/or
 - c. provide the Director, within such time as may be specified, with such reports, drawings, specifications, analytical data, 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 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" published jointly by the American Public Health Association, the American Waterworks Association and the Water Pollution Control Federation, or in accordance with an equivalent analytical methodology approved by the Director; and
 - b. ensure that all analytical determinations are undertaken by a laboratory acceptable to the Director.
4. Unless otherwise specified, all information required to be provided to the Director under this Licence shall be in writing, in such form (including number of copies), and of such content, as may be required to the Director.
5. The Licencee shall, in case of physical or mechanical breakdown of the wastewater treatment system:
 - a. notify the Director immediately;
 - b. identify the repairs required to the wastewater treatment system;
 - c. undertake all repairs to minimize unauthorized discharges of wastewater;
 - d. complete the repairs in accordance with any written instructions of the Director; and
 - e. notify the Department of Highways regional technical services engineer, in the event that the malfunction of the wastewater treatment system results in the discharge of contaminated effluent into the highway drainage system.
6. The Licencee shall construct and maintain an all-weather access road and a sewage and septage dumping station for truck hauled sewage and septage, with the dumping facility having an inclined splash ramp with a flat, smooth and hard surface that can be easily washed free of solids.
7. The Licencee shall install and maintain a fence around the wastewater treatment lagoon to control access.
8. The Licencee shall operate and maintain the wastewater treatment lagoon in such a manner that:
 - a. the organic loading on the primary cell, 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 the primary cell or secondary cells does not exceed 1.5 metres.
9. The Licencee shall ensure that septage is not discharged into the wastewater treatment lagoon between the 15th day of October of any year and the 1st day of June of the following year.
10. The Licencee shall, until a sewerage system becomes operational:
 - a. fill both the primary and secondary cells with water, to an elevation of 0.75 metres above the floor

- elevation of each respective cell, after all required soil sampling and testing requirements have been met and prior to the wastewater treatment lagoon being commissioned;
- b. maintain the liquid depth in the primary cell at an elevation of not less than 0.75 metres above the floor elevation of the primary cell, at all times; and
 - c. unless otherwise approved by the Director in advance, maintain the liquid depth in the secondary cell at an elevation of not less than 0.75 metres above the floor elevation of the secondary cell, at all times.
11. The Licencee shall not discharge effluent from the wastewater treatment lagoon where the discharge of effluent will cause or contribute to flooding along the drainage route.
 12. The Licencee shall:
 - a. prepare "as constructed drawings" for the Development and shall label the drawings "As Constructed"; and
 - b. provide to the Director, on or before June 1, 1997, two sets of "as constructed drawings" of the wastewater treatment lagoon.
 13. The Licencee shall, as deemed necessary by the Director, carry out any remedial measures or modifications in respect to matters authorized under this Licence.

SPECIFICATIONS, LIMITS, TERMS AND CONDITIONS

14. 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 metres and a width of 3.0 metres from the area where the cut-off will be constructed.
15. The Licencee shall construct and maintain the wastewater treatment lagoon with a continuous liner, including cutoffs, under all interior surfaces of the cells in accordance with the following specifications:
 - a. the liner shall be at least one metre in thickness;
 - b. the liner shall have a hydraulic conductivity of 1×10^{-6} centimetres per second or less; and
 - c. the liner shall be constructed to an elevation of 2.5 metres above the floor elevation of both the primary and the secondary cells.
16. 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.
17. The Licencee shall take and test undisturbed soil samples, in accordance with Schedule "A" attached to this Licence, from the liner; the number and location of samples and test methods to be specified by the designated Environment Officer up to a maximum of 20 samples.
18. The Licencee shall, not less than 2 weeks before the wastewater treatment lagoon is placed in operation, submit to the Director the results of the tests carried out pursuant to Clause 18 of this Licence.
19. The Licencee shall ensure that if, in the opinion of the Director, significant erosion of the interior surfaces of the dykes occurs, rip rap shall be placed on the interior dyke surfaces from 0.6 metres above the high water mark to at least 0.6 metres below the low water mark to protect the dykes from wave action.
20. The Licencee shall not construct, alter or operate the Development, or permit the Development to be constructed, altered or operated, in a way which causes or results in an odour nuisance, and shall take steps as the Director may require to eliminate or mitigate an odour nuisance.
21. The Licencee shall not discharge effluent from the development:
 - a. where the organic content of the effluent, as indicated by the five day biochemical oxygen demand, is in excess of 30 milligrams per litre;
 - b. where the fecal coliform content of the effluent, as indicated by the MPN index, is in excess of 200 per

- 100 millilitres of sample;
- c. where the total coliform content of the effluent, as indicated by the MPN index, is in excess of 1500 per 100 millilitres of sample;
 - d. where the chlorine content is detectable;
 - e. between the 1st day of November of any year and the 15th day of June of the following year; or
 - f. between the 1st day of July and the 15th day of October.
22. The Licencee shall maintain a record of all hauled waste including the number of loads on a daily and weekly basis, the volume of each load, the name of the hauler, and the source of the contents of each load according to the type of waste and the name and location of each property serviced. The Licencee shall submit an annual report of all the waste hauling information to the Director by the 15th of January of the following year.
23. The Licencee shall submit to the Director for approval, not later than October 1, 1996, a detailed groundwater monitoring plan indicating, but not limited to, the location, depth, and construction materials of the monitoring wells in addition to complying with the monitoring requirements prescribed under Clause 24 of this Licence.
24. The Licencee shall conduct a monitoring program, approved pursuant to Clause 23 if this Licence, of the groundwater monitoring well network and the monitoring program shall, unless otherwise approved by the Director:
- a. continue during the time the lagoon is in operation;
 - b. include samples collected from each well at least semi-annually;
 - c. the sample analysis and calculations for the following parameters:
 - i. pH;
 - ii. chloride;
 - iii. nitrate-nitrite nitrogen;
 - iv. Total Kjeldahl nitrogen;
 - v. ammonia nitrogen;
 - vi. sulphide;
 - vii. total and fecal coliform content;
 - viii. sodium; and
 - ix. phosphorous.
25. The Licencee shall, not less than 60 days after the results of the sample analysis are available, submit to the Director the results of the monitoring program for each year of monitoring program, carried out pursuant to Clause 24 of this Licence.

REVIEW AND REVOCATION

- A. If, in the opinion of the Director, 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 Director may, temporarily or permanently, revoke this Licence.
- B. If the Licencee has not commenced construction of the Development within three years of the date of this Licence, the Licence is revoked.
- 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 11 of The Environment Act.

"original signed by"

Larry Strachan, P. Eng.
Director
Environment Act

Client File No.: 4117.00

Schedule "A" to Environment Act Licence No. 2216

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 metres. 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 were the sample was taken, which ever 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.