



Conservation

Environmental Stewardship Division
Environmental Assessment and Licensing Branch
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FAXED

CLIENT FILE NO.: 72.10

March 2, 2010

Alexis Gardiner, C.A.O.
Village of Crystal City
Box 310
Crystal City, MB
R0K 0N0

Dear Ms. Gardiner:

Enclosed is **Environment Act Licence No. 2914** dated March 2, 2010 issued to the **Village of Crystal City** for the construction and operation of the Development being a wastewater collection system and wastewater treatment lagoon located in NW 24-2-12 WPM with discharge of treated effluent into Crystal Creek, in accordance with the Proposal filed under The Environment Act dated April 28, 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.

For further information on the administration and application of the Licence, please feel free to contact Bruce Webb, Environmental Engineer at (204) 945-7021.

Yours truly,

Tracey Braun, M. Sc.
Director
Environment Act

Enc.

c: Don Labossiere, Director, Environmental Operations
Public Registries

NOTE: Confirmation of Receipt of this Licence No. 2914 (*by the Licencee only*) is required by the Director of Environmental Assessment and Licensing. Please acknowledge receipt by signing in the space provided below and faxing a copy (letter only) to the Department by March 16, 2010.

On behalf of the Village of Crystal City

Date

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

LICENCE

Licence No. / Licence n° 2914

Issue Date / Date de délivrance March 2, 2010

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)

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

THE VILLAGE OF CRYSTAL CITY; "the Licencee"

for the construction and operation of the Development being a wastewater collection system and wastewater treatment lagoon located in NW 24-2-12 WPM with discharge of treated effluent into Crystal Creek, in accordance with the Proposal filed under The Environment Act dated April 28, 2009, and subject to the following specifications, limits, terms and conditions:

DEFINITIONS

In this Licence,

"**access road**" means a road that leads from a Provincial Trunk Highway, Provincial Road, or a municipal road;

"**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 the Environment Officer in writing;

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

"**ASAE**" means the American Society of Agricultural Engineers;

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

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

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

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

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

"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 five days at a temperature of 20°C;

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

"grab sample" means a quantity of wastewater taken at a given place and time;

"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;

"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;

"mil" means one-thousandth of an inch;

"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;

"PVC" means polyvinyl chloride;

"riprap" means small, broken stones or boulders placed compactly or irregularly on dykes or similar embankments for protection of earthen surfaces against the 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;

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

"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;

"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; 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. In addition to 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 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, ambient quality, aquatic toxicity, leachate characteristics and discharge or emission rates, and for such duration and at such frequencies as may be specified;
 - b) determine the environmental impact associated with the release of any pollutant 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.
2. The Licencee shall submit all information required to be provided to the Director under this Licence, in writing, in such form (including number of copies) and of such content as may be required by the Director.
3. The Licencee shall direct all wastewater generated within the Village of Crystal City toward the wastewater treatment lagoon or other approved sewage treatment facilities.
4. The Licencee shall actively participate in any future watershed based nutrient reduction program, approved by the Director, for Crystal Creek and/or the Pembina River, and associated waterways and watersheds.

5. The Licencee shall operate and maintain the wastewater treatment lagoon and wastewater collection system in such a manner that the release of offensive odours is minimized.

SPECIFICATIONS, LIMITS, TERMS AND CONDITIONS

Respecting Construction - General:

6. The Licencee shall notify the assigned Environment Officer not less than two weeks prior to beginning construction of the Development. The notification shall include the intended starting date of construction and the name of the contractor responsible for construction.
7. The Licencee shall dispose of non-reusable construction debris from the Development at a waste disposal ground operating under the authority of a permit issued pursuant to *Manitoba Regulation 150/91* respecting *Waste Disposal Grounds*, or any future amendment thereof, or a Licence issued pursuant to The Environment Act.
8. 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) provide a follow-up report to the Director on a reportable environmental accident outlining the cause(s) and proposing corrective action to prevent reoccurrence.
9. The Licencee shall:
 - a) not construct the wastewater treatment lagoon during periods of heavy rain;
 - b) place and/or isolate all dredged and construction material where it will not erode into any watercourse;
 - c) implement effective long-term sediment and erosion control measures to prevent soil-laden runoff, and/or silt from entering any watercourse during construction and until vegetation is established;
 - d) routinely inspect all erosion and sediment control structures and immediately complete any necessary maintenance or repair; and
 - e) use rock that is free of silt and clay for riprap.
10. The Licencee shall locate fuel storage and equipment servicing areas established for the construction and operation of the Development a minimum distance of 100 metres from any waterbody, and shall comply with the requirements of *Manitoba Regulation 188/2001* respecting *Storage and Handling of Petroleum Products and Allied Products* or any future amendment thereof.
11. The Licencee shall construct and maintain an all-weather access road to the wastewater treatment lagoon.
12. The Licencee shall construct a truck dumping station for truck hauled wastewater. The truck dumping facility shall have a surface splash ramp with a smooth hard surface that can be easily washed free of solids.

13. 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 metres high and have a locking gate, which shall be locked at all times except to allow access to the wastewater treatment lagoon.
14. The Licencee shall:
 - a) prepare "as constructed drawings" for the Development and shall label the drawings "As Constructed"; and
 - b) provide to the Director, within four months of the assigned Environment Officer's approval of the report required by sub-Clause 21 f) of this Licence, two copies of the "as constructed drawings" of the wastewater treatment lagoon.

Respecting Construction – New Secondary Cell:

15. The Licencee shall, prior to the construction of the dykes for the new secondary cell of the wastewater treatment lagoon, remove all organic topsoil from the area where the dykes will be constructed.
16. The Licencee shall construct and maintain a continuous liner under all interior surfaces of the new secondary cell of the wastewater treatment lagoon in accordance with the following specifications:
 - a) the liner shall be made of clay;
 - b) the liner shall be at least one metre in thickness;
 - c) the liner shall have a hydraulic conductivity of 1×10^{-7} centimetres per second or less at all locations; and
 - d) the liner shall be constructed to an elevation of 2.5 metres above the floor elevation of the cell.
17. 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.
18. The Licencee shall take and test samples, in accordance with Schedule "A" attached to this Licence, from the liner of the new secondary cell 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.
19. The Licencee shall, not less than 2 weeks before the new secondary cell of the wastewater treatment lagoon is placed in operation, submit for the approval of the Environment Officer the results of the tests carried out pursuant to Clause 18 of this Licence.

Respecting Construction – Remediation of Primary and Original Secondary Cell:

20. The Licencee shall, prior to reconstructing the primary and original secondary cells of the wastewater treatment lagoon, remove sludge from the cells and incorporate it in cover material on the interior of the dykes of the wastewater treatment lagoon. Sludge stored during the construction period shall be stored within the wastewater treatment lagoon or within a synthetically lined temporary dewatering and storage area. Liquid from a temporary storage area shall be pumped into the wastewater treatment lagoon, and not discharged to the environment.

21. The Licencee shall construct and maintain a continuous liner underlying the primary and original secondary cells of the wastewater treatment lagoon, such that:
 - a) the liner is constructed from PVC geomembrane that has been manufactured in accordance with ASTM Standard D 7176-06;
 - b) the liner has a minimum thickness of 30 mils;
 - c) the liner is installed in accordance with ASAE Standard EP340.2 for the Installation of Flexible Membrane Linings;
 - d) the liner is installed to a minimum elevation of 2.5 metres above the base of both the primary and original secondary cells;
 - e) the liner is free of holes and has a hydraulic conductivity not exceeding 3.0×10^{-9} centimetres per second over the entire surface area of the liner;
 - f) the liner is tested for the integrity of all field seams by the air lance or ultrasonic pulse echo test method, in accordance with ASTM Standard D 4437-99, and a testing report is prepared and submitted to the Environment Officer for approval; and
 - g) the liner is covered with sand or other granular cover material to a minimum depth of 0.30 metre measured perpendicular to the surface of the liner.
22. The Licencee shall construct and maintain a gas relief system under the liner for the primary and original secondary cells of the wastewater treatment lagoon.
23. The Licencee shall notify the assigned Environment Officer one week prior to commencing the installation of the liner and the gas relief system.
24. The Licencee shall not cover the liner or use the wastewater treatment lagoon until receiving the approval of the assigned Environment Officer of the report submitted pursuant to sub-Clause 21 f) of this Licence.
25. The Licencee shall complete the installation of the liner of the wastewater treatment lagoon between the 15th day of May and the 15th day of October of any year.

Respecting Operation:

26. The Licencee shall obtain and maintain classification of the Development pursuant to *Manitoba Regulation 77/2003* respecting *Water and Wastewater Facility Operators* or any future amendment thereof and maintain compliance with all requirements of the regulation including, but not limited to, the preparation and maintenance of a Table of Organization, Emergency Response Plan and Standard Operating Procedures.
27. The Licencee shall carry out the operation of the Development with individuals properly certified to do so pursuant to *Manitoba Regulation 77/2003* respecting *Water and Wastewater Facility Operators* or any future amendment thereof.
28. The Licencee shall operate the wastewater treatment lagoon such that the wastewater load does not exceed the design capacities as follows:
 - 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 all primary and secondary cells does not exceed 1.5 metres.

29. The Licencee shall not discharge septage into the wastewater treatment lagoon between the 15th day of October of any year and the 1st day of June of the following year.
30. The Licencee shall not discharge effluent from the wastewater treatment lagoon:
 - a) where the organic content of the effluent, as indicated by the five-day biochemical oxygen demand, is in excess of 25 milligrams per litre;
 - b) where the total suspended solids content of the effluent is in excess of 25 milligrams per litre, unless the exceedance is caused by algae;
 - c) where the fecal coliform content of the effluent, as indicated by the MPN index, is in excess of 200 per 100 millilitres of sample;
 - d) where the total coliform content of the effluent, as indicated by the MPN index, is in excess of 1500 per 100 millilitres of sample; and
 - e) between the 1st day of November of any year and the 15th day of June of the following year.
31. The Licencee shall, when discharging effluent from the wastewater treatment lagoon, limit the rate of discharge to approximately 14 litres per second, or approximately one half of the maximum discharge capacity of the outlet. A higher rate of discharge may be used if the depth of liquid in the primary cell of the wastewater treatment lagoon reaches 1.5 metres during the discharge period, or during a discharge after October 15 of any year.
32. The Licencee shall, in case of physical or mechanical breakdown of the wastewater collection and/or treatment system:
 - a) notify the Director immediately;
 - b) identify the repairs required to the wastewater collection and/or treatment system; and
 - c) complete the repairs in accordance with the written instructions of the Director.

Respecting Maintenance:

33. The Licencee shall, if in the opinion of the Director, significant erosion of the interior surfaces of the dykes occurs, place riprap on the interior dyke surfaces from 0.6 metres above the high water mark to the bottom of the dykes to protect the dykes from wave action.
34. 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 metres on all dykes.
35. 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.
36. The Licencee shall implement an ongoing program to ensure that burrowing animals are removed from the site of the wastewater treatment lagoon.

MONITORING AND REPORTING SPECIFICATIONS

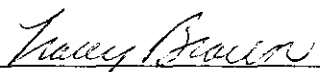
37. The Licencee shall, unless otherwise specified in this Licence:

- a) carry out all preservations and analyses on liquid samples in accordance with the methods prescribed in the Standard Methods for the Examination of Water and Wastewater, or in accordance with equivalent preservation and analytical methodologies approved by the Director;
 - b) ensure that all analytical determinations are undertaken by an accredited laboratory; and
 - c) report the results to the Director, in writing and in an electronic format acceptable to the Director, within 60 days of the samples being taken.
38. The Licencee shall prior to each effluent discharge campaign 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 litre;
 - b) the organic content as indicated by the five-day carbonaceous biochemical oxygen demand and expressed as milligrams per litre;
 - c) the total suspended solids content expressed as milligrams per litre;
 - d) the fecal coliform content as indicated by the MPN index and expressed as MPN per 100 millilitres per sample; and
 - e) the total coliform content as indicated by the MPN index and expressed as MPN per 100 millilitres per sample.
39. 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; and
 - iii) effluent discharge dates;
 - b) make the records being maintained pursuant to sub-Clause 39 a) of this Licence 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.
40. The Licencee shall, during the first year of operation of the Development following the remediation of the primary cell and original secondary cell, obtain two representative grab samples of the effluent during each effluent discharge campaign. The grab samples shall be obtained near the start of each discharge and near the end of each discharge, and shall be analysed and reported in accordance with Schedule "B" attached to 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.



Tracey Braun, M. Sc.
Director
Environment Act

Client File No.: 72.10

Schedule "A" to Environment Act Licence No. 2914

Soil Sampling:

1. The Licencee shall provide a drilling rig, acceptable to the designated Environment Officer, to extract samples from the liner that is not placed or found at the surface of the lagoon structure. This includes all wastewater treatment lagoons constructed with clay cut-offs at the interior base of the dyke or with a clay cut-off in the centre of the dyke. The drill rig shall have the capacity to drill to the maximum depth of the clay cut-off plus an additional depth of 2 metres. The drill rig shall be equipped with both standard and hollow stem augers. The minimum diameter of the hole 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. 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 where 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 or weathered soils.
5. The Licencee shall provide, to the designated Environment Officer and to the laboratory technician, a report on the collection of soil samples that includes but is not limited to the following: a plot plan indicating all drill holes, onsite visual observations, 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 that 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, which ever is greater.
- c) A 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 that 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) A complete laboratory report, as outlined in ASTM D 2435, shall be supplied for each soil sample collected in the field.

Schedule "B" to Environment Act Licence No. 2914

Canadian Council of Ministers of the Environment
Initial Characterization of Wastewater

Facility Size: Very small (less than 500 m³/day)

Facility Type: Facultative wastewater treatment lagoon - intermittent discharge

Effluent Sampling:

During the first year of operation, for all discharge events:

1. Obtain a representative grab sample of the discharging effluent near the beginning of the discharge period and near the end of the discharge period (i.e. two samples for each discharge event);
2. Determine the temperature of each sample at the time of sampling; and
3. Carry out all preservations and analyses on liquid samples in accordance with the methods prescribed in the Standard Methods for the Examination of Water and Wastewater, or in accordance with equivalent preservation and analytical methodologies approved by the Director.

Effluent Analysis:

1. For each grab sample, have the grab sample analysed by an accredited laboratory for:
 - a) the organic content as indicated by the five-day biochemical oxygen demand and expressed as milligrams per litre;
 - b) the organic content as indicated by the five-day carbonaceous biochemical oxygen demand and expressed as milligrams per litre;
 - c) the total suspended solids content expressed as milligrams per litre;
 - d) the *Esherichia coli* (*E. Coli*) content as indicted by the MPN index and expressed as MPN per 100 millilitres per sample;
 - e) the fecal coliform content as indicated by the MPN index and expressed as MPN per 100 millilitres per sample;
 - f) the total coliform content as indicated by the MPN index and expressed as MPN per 100 millilitres per sample;
 - g) total ammonia nitrogen expressed as milligrams per litre;
 - h) nitrate-nitrite nitrogen expressed as milligrams per litre;
 - i) total kjeldahl nitrogen (TKN) expressed as milligrams per litre;
 - j) dissolved phosphorus expressed as milligrams per litre;
 - k) total phosphorus expressed as milligrams per litre; and
 - l) pH.

Effluent Reporting:

1. For each grab sample, report the results to the Director, in writing or in an electronic format acceptable to the Director within 60 days of the sampling date. The report shall include the sampling date, sample temperature, the dates of the effluent discharge, and copies of the laboratory analytical results of the sampled effluent.