

LICENCE

Licence No. / Licence n° 2758

Issue Date / Date de délivrance March 15, 2007

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 Sections 11(1) / Conformément au Paragraphe 11(1)

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

UNIVERSITY OF MANITOBA "the Licencee"

for the construction and operation of the Development being a wastewater collection system and rotating biological contactor sewage treatment plant located on River Lot 7, Parish of Saint Norbert in the Rural Municipality of Ritchot and with discharge of treated effluent into the Red River, in accordance with the Proposal filed pursuant to The Environment Act on May 23, 2006, and subsequent information submitted on September 12, 2006 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 Conservation to be equivalent to the SCC, or 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 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;

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

"**bioassay**" means a method of determining toxic effects of industrial wastes and other wastewaters by using viable organisms;

"**composite sample**" means a quantity of wastewater consisting of equal volumes of effluent, or flow proportional volumes, and may be collected manually or by means of an automatic sampling device;

"**Director**" 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 (BOD₅)**" means that part of oxygen usually associated with biochemical oxidation of organic material within 5 days at 20°C;

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

"**influent**" means water, wastewater, or other liquid flowing into the sewage treatment plant;

"**MPN index**" means the most probable number of coliform organisms in a given volume of wastewater as determined by statistical estimation;

"**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, and 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;

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

"sewage" means human body, toilet, liquid, waterbourne culinary, sink or laundry waste;

"sewage effluent" means sewage after it has undergone at least one form of physical, or biological treatment;

"sewage treatment plant" means the component of this development which consists of the central facility, of the wastewater treatment facilities, which contains all treatment processes exclusive of the wastewater collection systems;

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

"sludge solids" means solids in sludge;

"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, non-spore 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; and

"UV disinfection" means a disinfection process for treating wastewater using ultraviolet radiation;

"UV germicidal dose" means the units of intensity of ultra violet light that is required to kill bacteria and viruses present in the sewage effluent.

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

GENERAL SPECIFICATIONS

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, 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;
 - 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, bioassay data, flow rate measurements and such other information as may from time to time be requested.

2. The Licencee shall, unless otherwise specified in this Licence:
 - a) carry out all preservations and analyses of 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) have analytical determinations undertaken by an accredited laboratory; and
 - c) report the results to the Director, in writing, within 60 days of the samples being taken.

3. 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.

4. The Licencee shall operate the sewage treatment plant in such a manner that:
 - a) all wastewater generated within the Glenlea Research Station is directed toward the sewage treatment plant or other approved sewage treatment facilities;
 - b) only wastewater as defined in this Licence is discharged into the sewage treatment plant;
 - c) primary screenings are disposed in a waste disposal ground operated under:
 - i) a permit issued in accordance with *Manitoba Regulation 150/91* or any future amendment thereof; or
 - ii) the authority of a Licence issued under The Environment Act;
 - d) sewage sludge is disposed at the City of Winnipeg North End Water Pollution Control Centre; and
 - e) sludge solids are transported in containers in such a manner to prevent loss of solids to the satisfaction of an Environment Officer.

5. The Licencee shall install, operate and maintain an effluent discharge pipeline from the sewage treatment plant into the Red River such that freezing of the effluent in the pipeline is prevented.
6. The Licencee shall not spill, or allow to be spilled, wastewater and/or sludge in the area around the sewage treatment plant.
7. The Licencee shall have the operation of the Development carried out by individuals properly trained and qualified to do so.
8. The Licencee shall not cause or permit an odour 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 an odour nuisance.
9. The Licencee shall have adequate instrumentation installed to provide constant monitoring of the UV process to ensure compliance with the disinfection requirements. Such instrumentation shall include but not be limited to the following:
 - a) an UV sensor to monitor lamp intensity;
 - b) an appropriate alarm and shutdown systems;
 - c) a lamp monitoring system to identify the location of individual lamp failures;
 - d) an hour meter which cannot be reset to display actual hours of UV lamp operation; and
 - e) protective circuits for overcurrent and ground current leakage detection.
10. The Licencee shall in case of physical or mechanical breakdown of the Development:
 - a) notify the Director immediately;
 - b) identify the repairs required to the wastewater collection system and/or sewage treatment plant; and
 - c) complete the repairs in accordance with the written instructions of the Director.
11. The Licencee shall actively participate in any future watershed based management study, plan or nutrient reduction program, approved by the Director, for the Red River and associated waterways and watersheds.

SPECIFICATIONS, LIMITS, TERMS AND CONDITIONS

12. The Licencee shall notify the assigned Environment Officer prior to beginning construction of the sewage treatment plant. The notification shall include the

- intended starting date of construction and the name of the Licencee's contact person at the construction site.
13. The Licencee shall operate and maintain the sewage treatment plant in such a manner that:
 - a) the maximum daily flow rate is not in excess of 95 cubic metres over any 24-hour period;
 - b) the organic loading is not in excess of 23.75 kilograms of five-day biochemical oxygen demand over any 24-hour period; and
 - c) the release of offensive odours is minimized.
 14. The Licencee shall utilize UV lamps in the disinfection process that have a rated output of at least 254 nanometres (nm) capable of delivering a germicidal dose in excess of 30,000 microwatt seconds/sq cm.
 15. The Licencee shall operate and maintain the UV disinfection system to give a germicidal dose of 80% or more of the design UV germicidal dose, at the end of the lamp life.
 16. The Licencee shall locate fuel storage and equipment servicing areas established for the construction 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 Gasoline and Associated Products.
 17. The Licencee shall install and maintain a security fence around all components of the sewage treatment plant that are not enclosed within secured buildings.
 18. The Licencee shall not discharge effluent from the sewage treatment plant, as sampled at the monitoring station located after UV disinfection, where:
 - a) the organic content of the effluent, as indicated by the five-day biochemical oxygen demand (BOD₅), is in excess of 30 milligrams per litre;
 - b) the fecal coliform content of the effluent, as indicated by the MPN index, is in excess of 200 per 100 millilitres of sample;
 - c) the total coliform content of the effluent, as indicated by the MPN index, is in excess of 1500 per 100 millilitres of sample;
 - d) the total suspended solids content of the effluent, as indicated by the non-filterable residue is in excess of 30 milligrams per litre; and
 - e) the total ammonia concentration of the effluent is in excess of the concentration specified in Schedule "A" attached to this Licence as determined by the pH of the effluent.

MONITORING AND REPORTING SPECIFICATIONS

19. The Licencee shall monitor, and make the records of such monitoring available to the Director as may be requested, the sewage treatment process for the following parameters:
 - a) total flow rate(s) into the plant;
 - b) flow rate(s) into and through the UV disinfection system; and
 - c) other process parameters approved or required by the Director.

20. The Licencee shall:
 - a) construct and make available for use by an Environment Officer, a secured and heated effluent monitoring station, allowing direct access to the discharge pipeline following the UV disinfection;
 - b) have the monitoring station accessible to an Environment Officer at all times;
 - c) install and maintain a flow measuring device at the monitoring station or at a location acceptable to the Director which is capable of measuring the volume of effluent with an accuracy of ± 2 percent;
 - d) have the flow measuring device re-calibrated biannually or on the request of an Environment Officer;
 - e) equip the monitoring station with a flow-proportional sampling device equipped to function with the flow measuring device and have the sampling device available on request for use by an Environment Officer; and
 - f) equip the monitoring station with an electrical power source of 15 amperes at 110 volts.

21. The Licencee shall:
 - a) take one composite sample of effluent, from the effluent monitoring station during the discharge period once each month;
 - b) take three grab samples of the effluent from the effluent monitoring station during the discharge period once each month;
 - c) have the composite effluent sample analyzed for five-day biochemical oxygen demand, temperature, pH, total ammonia and total suspended solids; and
 - d) have the grab samples analyzed for fecal coliform content and total coliform content.

22. The Licencee shall, for a period of at least two years following the commencement of operation of the sewage treatment plant under this Licence, once every three months, obtain samples of treated effluent from the final discharge point of the sewage treatment plant. The samples shall be preserved, analyzed and reported in accordance with the requirements of Clause 2 of this Licence, and shall be analyzed for:

- a) conductivity;
 - b) total Kjeldahl nitrogen;
 - c) nitrate-nitrite nitrogen
 - d) total dissolved phosphorus;
 - e) total particulate phosphorus; and
 - f) total inorganic phosphorus.
23. The Licencee shall report the results from the sampling required by Clauses 21 and 22 of this Licence to the Director in accordance with the requirements of Clause 2 c) of this Licence.
24. The Licencee shall:
- a) prepare "as constructed drawings" for the Development, including the effluent discharge pipeline, complete with final elevations, and shall label the drawings "as constructed"; and
 - b) provide to the Director, on or before March 31, 2008, two sets of "as constructed drawings" of the Development.

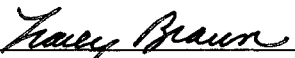
DECOMMISSIONING

25. The Licencee shall, within one year of placing the Development into operation, decommission the sequencing batch reactor sewage treatment plant and all inactive septic fields at the Glenlea Research Station in accordance with the following decommissioning terms and any written instructions of the Director:
- a) prevent any additional wastewater or septage from being discharged into the sequencing batch reactor sewage treatment plant or the septic fields that will no longer be used;
 - b) transfer the liquid and sludge contents of the sequencing batch reactor sewage treatment plant to the rotating biological contactor sewage treatment plant;
 - c) disconnect all electric supply lines and pipelines to the sequencing batch reactor sewage treatment plant;
 - d) rinse and remove all residuals from the sequencing batch reactor sewage treatment plant and dispose of all unsalvageable components in a waste disposal ground operated under:
 - i) a permit issued in accordance with *Manitoba Regulation 150/91* or any future amendment thereof; or
 - ii) the authority of a Licence issued under The Environment Act;
 - e) fill any existing, associated below grade metal tanks that are not being removed with sand;
 - f) backfill with compacted granular or till material and grade the site to the surrounding natural grade; and

- g) have a contractor, operating in accordance with the requirements of *Manitoba Regulation 83/2003, Onsite Wastewater Management Systems Regulation*, decommission all septic fields that will no longer be used.

REVIEW AND REVOCATION

- A. Environment Act Licence No. 622 is rescinded upon successful commissioning of the rotating biological contactor sewage treatment plant.
- B. 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.
- C. If the Licencee has not commenced construction of the Development within two years of the date of this Licence, the Licence is revoked.
- D. 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.: 104.20

Schedule A
To Environment Act Licence No. 2758

Effluent pH	Total Ammonia (mg/L)
6.50	48.83
6.60	46.84
6.70	44.57
6.80	42.00
6.90	39.16
7.00	36.09
7.10	32.86
7.20	29.54
7.30	26.21
7.40	22.97
7.50	19.89
7.60	17.03
7.70	14.44
7.80	12.14
7.90	10.13
8.00	8.41
8.10	6.95
8.20	5.73
8.30	4.71
8.40	3.88
8.50	3.20
8.60	2.65
8.70	2.20
8.80	1.84
8.90	1.56
9.00	1.32