

Environment Act Licence

Manitoba
Environment



Licence No. 1865
Issue Date July 6, 1994

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

THIS LICENCE IS ISSUED TO:

GOOD HOPE HOLDING CO. LTD.: "the Licencee"

for the construction and operation of the Development being a wastewater collection system and a wastewater treatment lagoon located on the south-west quarter of Section 7, Township 11, Range 7 WPM and with discharge of treated effluent by spray irrigation onto agricultural land and subject to the following specifications, limits, terms and conditions:

DEFINITIONS

In this Licence,

"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;

"ASAE" means the American Society of Agricultural Engineers;

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

"coefficient of permeability" 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;

"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 °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;

"hazardous waste" means a product, substance or organism that meets the criteria set out in the Classification Criteria for Products, Substances and Organisms Regulation, Manitoba Regulation 282/87, and that is intended for treatment or disposal and includes recyclable material;

“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;

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

“livestock waste” means manure from livestock;

“livestock” means animals or poultry not kept exclusively as pets, excluding bees;

“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;

“pest” means any injurious, noxious or troublesome, insect, weed, rodent, fungus, alga, or other plant or animal;

“pesticide” means any chemical or biological agent registered under the Pest Control Products Act of Canada and used or represented as a means for preventing, destroying, mitigating or controlling any pest;

“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;

“recyclable material” means a hazardous waste that is intended for reuse, recovery or recycling but does not include a product, substance or organism

- (a) that is to be applied into or onto land, or
- (b) that is to be disposed of in a thermal destruction process;

“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;

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

“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 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 REQUIREMENTS

1. The Licencee shall direct all sewage generated within the farmsite toward the wastewater treatment lagoon or other approved sewage treatment facilities.
2. The Licencee shall ensure that the following substances are not discharged to the wastewater collection system or the wastewater treatment lagoon:
 - (a) pesticides;
 - (b) hazardous wastes; and
 - (c) livestock waste.
3. The Licencee shall operate and maintain the wastewater treatment lagoon in such a manner that:
 - (a) the release of offensive odours is minimized;
 - (b) 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
 - (c) the depth of liquid in the primary cell or secondary cell does not exceed 1.5 metres.
4. 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;
 - (c) undertake all repairs to minimize unauthorized discharges of wastewater; and
 - (d) complete the repairs in accordance with any written instructions of the Director.
5. The Licencee shall install and maintain a fence around the wastewater treatment lagoon to control access.

CONSTRUCTION SPECIFICATIONS

6. The Licencee shall construct and maintain a continuous poly-vinyl chloride geosynthetic membrane liner underlying each cell of the wastewater treatment lagoon system such that:
 - (a) the liner shall be installed in accordance with ASAE Standard EP340.2 for the Installation of Flexible Membrane Linings;
 - (b) the liner shall be installed to minimum elevations of 1.8 metres above the base of both the primary and secondary cells respectively;

- (c) the liner shall have a minimum thickness of 20 mils;
 - (d) the liner shall be free of holes and its coefficient of permeability shall not exceed 1.0×10^{-9} centimetres per second over the entire surface area of both the primary and secondary cells;
 - (e) in accordance with ASTM Standard D-4437, the integrity of all field seams shall be tested by the air lance or ultrasonic pulse echo test methods and a testing report shall be prepared; and
 - (f) the liner shall be covered with sand or other granular cover material to a minimum depth of 0.30 metre measured perpendicular to the surface of the liner.
7. The Licencee shall construct and maintain a gas relief system under the liner for both cells of the wastewater treatment lagoon.
8. The Licencee shall ensure that if, in the opinion of the Director, significant erosion of the granular material covering the liner occurs, rip rap shall be placed on the interior dyke surfaces from 0.6 metres above the high water mark to 0.6 metres below the low water mark to protect the dykes from wave action.

DISCHARGE LIMITS, TERMS AND CONDITIONS

9. 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 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; or
 - (d) between the 1st day of October of any year and the 15th day of May of the following year.
10. The Licencee shall ensure that all effluent is disposed of by spray irrigation onto land owned by or under the control of the Licencee and that:
- (a) effluent is only discharged to irrigate:
 - (i) actively growing cereal, forage or oil seed crops;
 - (ii) grasslands which will not be utilized for grazing:
 - A. by dairy cattle for at least 30 days after effluent is applied; or
 - B. by livestock other than dairy cattle for at least seven days after effluent is applied;
 - (b) after agriculture crops are irrigated, harvesting of the crops does not take place for at least seven days;
 - (c) if corn has been grown, it is used solely for making silage;
 - (d) for at least 10 continuous hours in every 24-hour period, no effluent is applied to the particular lands;
 - (e) if ponding or surface runoff occurs during application the gross depth of effluent applied during any application of effluent shall be reduced so that ponding or surface runoff does not occur;

- (f) the sodium adsorption ratio of the effluent does not exceed 6.0; and
 - (g) the chloride application rate does not exceed 100 kilograms per hectare per year.
11. The Licencee shall not discharge effluent, by spray irrigation:
- (a) within 300 metres of any dwelling not owned or lawfully controlled by the Licencee;
 - (b) within 100 metres of any surface watercourse or groundwater well; or
 - (c) within 100 metres of any adjoining property boundary.

MONITORING AND REPORTING SPECIFICATIONS

12. The Licencee shall provide the Director with a site plan of all the irrigation sites and a topographic map for all effluent irrigation sites which includes the land drainage pattern within a one kilometre radius of all irrigation sites.
13. The Licencee shall arrange with the designated Environment Officer a mutually acceptable time and date for the required testing between the 15th day of May and the 15th day of October of any year.
14. The Licencee shall, at least 2 weeks before each cell of the wastewater treatment lagoon is placed in operation, submit to the Director all reports and results of the tests carried out pursuant to Clause 6, of this Licence, for the respective cell which is to be placed into operation.
15. The Licencee shall, on or before the 1st day of June, 1995, provide to the Director "as constructed" drawings of the wastewater treatment lagoon and all appurtenances.

REVOCATION

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 herein, the Director may revoke, temporarily or permanently, this Licence.



Larry Strachan, P. Eng.
Director
Environment Act

JUSTIFICATION FOR ALTERATION
TO
THE RECOMMENDATIONS OF THE CLEAN ENVIRONMENT
COMMISSION

The Manitoba Clean Environment Commission recommendations were included in the Licence to the Good Hope Holding Co. Ltd. respecting the Proposed Development of a wastewater treatment lagoon except for the following changes:

Recommendation 1 An on-site plan detailing the location of the proposed lagoon in Section 7-11-7W in relation to the contours and the resulting land drainage pattern, potential water courses, location of dwellings, access roads, fields intended for effluent disposal, the location of wells, the soil type (and other appropriate land and physical features) is required and shall be filed with Manitoba Environment.

Change/Justification The recommendation has not been included in its entirety. The Licencee will be required to provide an "as-constructed" drawing of the wastewater treatment lagoon and a site plan of all lands which form part of the effluent irrigation area including the drainage pattern around these lands. Restrictions on separation distances between the effluent irrigation sites and dwellings, adjoining properties, watercourses and groundwater wells have been included in the Licence. Information on the location of dwellings and the agricultural soil types already exists and is available from various government sources.

Recommendation 2 An off-site plan covering an area within a radius of 800 metres of the lagoon showing buildings and structures and their use, stream flows, wet and marshy areas and the general slope and direction of ground water movement is required and shall be filed with Manitoba Environment.

Change/Justification The recommendation has not been included in its entirety. The Licence requires that the wastewater treatment lagoon be constructed with an impermeable liner and standards for the liner's installation and testing are included.

Recommendation 3 The lining of the lagoon should be designed with a hydraulic conductivity which meets or exceeds Manitoba Environment's guidelines, as specified in the Design Objectives for Standard Sewage Lagoons (April, 1982), to mitigate seepage and insure no additional adverse effects on the quality of the groundwater supply in the site area. The lagoon should also be designed so that there will be no accidental releases of wastes to the Assiniboine River due to major rainfall events and/or failure of the lagoon dykes.

- Change/Justification** The recommendation has not been included in its entirety. As previously stated, the Licence requires that the wastewater treatment lagoon be constructed with an impermeable liner and standards for the liner's installation and testing are included. The hydraulic conductivity (i.e. coefficient of permeability) for the structure exceeds the standard guideline requirements. The Licence restricts the discharge method to effluent irrigation disposal and any discharge to the Assiniboine River would contravene the Licence. The hydraulic storage requirement resulting from precipitation events is included in the design storage capacity.
- Recommendation 4** All phases of construction must be supervised by an engineer or qualified technician and the development certified to be in accordance with the design criteria in order to ensure the integrity of the liner. The liner is to be inspected, approved and certified by Manitoba Environment prior to operation.
- Change/Justification** The recommendation has not been included in its entirety. The Licence specifies the standards that must be followed for the installation and testing of the liner. A report on the testing of the liner is required in accordance with the standards specified. The Licencee is required to provide an "as-constructed" plan of the wastewater treatment lagoon to confirm construction details. A requirement for construction supervision by an engineer or qualified technician has not been included.
- Recommendation 5** Detailed inspection and analysis of the liner (following a total withdrawal of effluent) by an engineer or qualified technician is to be performed two years after operation commences and within two year time intervals thereafter. The results of the analysis are to be filed with Manitoba Environment.
- Change/Justification** The recommendation has not been included. The proponent altered the original design to incorporate a poly-vinyl chloride geosynthetic membrane liner. The Licence requires that the wastewater treatment lagoon be constructed with an impermeable liner and standards for the liner's installation and testing are included. The liner will be covered with sand or other granular material to protect the lining material. Regular inspection of the lining material is not required.

Recommendation 6 Observation (ground water monitoring) wells shall be provided to establish base line conditions, groundwater levels, and the direction of flow of the groundwater and shall include ongoing operational data. The baseline information will be utilized in preparation of a hydrogeological study to predict the effluent plume and assist in identifying risks associated with effluent movement. Based upon the hydrogeological study, observation wells are to be placed adjacent to the lagoon, the irrigation tracts and at some location along the projected plume in a direction towards the Assiniboine River.

Change/Justification The recommendation has not been included. The justification is the same as for Recommendation 5 above.

Recommendation 7 The effect of expected seepage on the soil, groundwater, and any bodies of water within the path of discharge flow or in the event of a leak, must be mitigated to the satisfaction of Manitoba Environment. The use of appropriate technologies and their respective environmental impacts (risk assessment) should be evaluated or confirmed after the hydrogeological study has been completed.

Change/Justification The recommendation has not been included in its entirety. Manitoba Environment is satisfied that the poly-vinyl chloride geosynthetic membrane liner will adequately protect groundwater, provided the liner is installed and tested in accordance with the Licence. Additional justification is the same as for Recommendation 5 above.

Recommendation 8 Lagoon operating and effluent discharge guidelines shall be required in the Licence.

Change/Justification The recommendation has not been included in its entirety. Effluent quality and effluent irrigation restrictions are specified in the Licence. The Licencee may want to develop operating and effluent irrigation procedures however it is not necessary to include that requirement in the Licence in order to protect the environment.

Recommendation 9 An extensive monitoring plan is required for the observation wells, operation of the lagoon and for the effluent disposal program and should include the locations and frequency of the test and reporting mechanism. Biological and chemical analyses are to be included. The effluent is to be checked (conductivity, S.A.R.) prior to land application to ensure that guidelines are being met. A comprehensive record of the filling and withdrawing of the lagoon shall include the date, origin and estimated effluent volumes. All records should be provided to Manitoba Environment on a specified annual schedule.

Change/Justification The recommendation has not been included in its entirety. The extensive monitoring program is not required to protect the environment. The Licence regulates the allowable sodium adsorption ratio (SAR) in the effluent prior to irrigation.

Recommendation 10 An effluent discharge plan will be submitted annually for approval by Manitoba Environment and must include the proposed application rates, areas available for irrigation, timing and frequency of disposal, the type of crops and their use, the method and the equipment to be used for disposal. Only land owned by the Colony is to be used for effluent irrigation. The plan will include testing of the soils to determine rate of application.

Change/Justification The recommendation has not been included in its entirety. The application of treated effluent will vary dependent on weather conditions and crop needs therefore the timing and frequency of application cannot be predicted. Effluent irrigation is restricted to application on actively growing cereal, forage or oil seed crops or grasslands to provide for nutrient uptake by the plants. Unlike livestock waste, the agricultural value of effluent irrigation with treated domestic wastewater is in the recycling of the water, not the nutrients. On a comparative basis treated wastewater contains very little nutrient value. Soil testing is a good agricultural management practice however it is not necessary to include that requirement in the Licence in order to protect the environment.

Recommendation 11 All domestic sewage from the Colony operation is to be directed to the lagoon. Any dilution of the secondary effluent to achieve the desired sodium adsorption ratio is to be approved by Manitoba Environment. No chemicals, livestock waste, or hazardous waste are to be discharged into the domestic wastewater treatment stream.

Change/Justification The recommendation has not been included in its entirety. The Licence requires that all domestic sewage be directed towards the wastewater treatment lagoon. It is unreasonable to prohibit the discharge of all chemical to the wastewater treatment lagoon. The Licence prohibits the discharge of pesticides, hazardous wastes and livestock waste to the sewage collection and treatment system. The disposal of hazardous wastes is regulated under the Dangerous Goods Handling and Transportation Act.

Recommendation 12 A procedural (operating) manual, approved by Manitoba Environment, shall be maintained and kept available for the use of those responsible for the ongoing operation of the lagoon system. The manual shall include a contingency plan to deal with physical or mechanical failure, failure of the lagoon to operate according to the design effect. The contingency plan shall include procedures for immediate notification to Manitoba Environment of any and all failures.

Change/Justification The recommendation has not been included. The Licencee may want to develop operating procedures however it is not necessary to include that requirement in the Licence in order to protect the environment. The Licence requires the notification of the department in cases of physical or mechanical breakdown of the collection or treatment systems.

Recommendation 13 Manitoba Environment shall ensure that the on-site plan, the off-site plan, the monitoring plan, liner certificate reports and all monitoring and discharge records are made available to the public.

Change/Justification The recommendation has not been included. The Licence is issued to the proponent and not to Manitoba Environment. Monitoring and discharge records are public information on request.



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Director
Environment Act

File: 3425.00