



Environment and Climate

Environmental Approvals Branch
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File No.: 5876.00

August 23, 2023

Peter Wipf / Calvin Wipf
Maxwell Colony Farms
10450 Assiniboine Road
Cartier MB R4K 1C3
cal.wipf@gmail.com

Dear Peter Wipf / Calvin Wipf:

Re: Environment Act Licence No. 3402

Thank you for your January 27, 2016, Environment Act proposal and March 29, 2022, notice of alteration. Enclosed is Environment Act Licence No. 3402 to Maxwell Hutterian Mutual Corporation for the construction and operation of a wastewater treatment lagoon.

Maxwell Hutterian Mutual Corporation must follow all licence requirements and federal, provincial, and municipal regulations and by-laws. The licensee must obtain approval from the director per The Environment Act to alter the development.

Anyone affected by this decision may appeal, in writing, to the Minister of Environment and Climate at minec@leg.gov.mb.ca by September 22, 2023. The licence is available on the public registry at <https://www.gov.mb.ca/sd/eal/registries/index.html>.

If you have any questions about this approval, please contact Sonja Bridges, Acting Regional Supervisor, Environmental Compliance and Enforcement Branch at EnvCEWinnipeg@gov.mb.ca or 204-945-8214.

Sincerely,

Original Signed By
Agnes Wittmann
Director
The Environment Act

Enclosure

c. Sonja Bridges

LICENCE

File No.: 5876.00

Licence No. / Licence n°: 3402
Issue Date / Date de délivrance: August 23, 2023

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) and 14(2) / Conformément au Paragraphe 11(1) et 14(2)

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

MAXWELL HUTTERIAN MUTUAL CORPORATION; "the licensee"

for the construction, operation, and maintenance of the development being a wastewater collection system and a wastewater treatment lagoon with a wetland treatment cell with 365 days of hydraulic storage capacity of 25,260 cubic metres (69.2 cubic metres per day average for 12 months), located on River Lots 106 to 108 (approximate UTM coordinates for the site are 596450 m E, 5533700 m N), Parish of St. Francois Xavier in the Rural Municipality of Cartier to serve the Maxwell Hutterian Mutual Corporation with discharge from the wastewater treatment lagoon between June 15th and October 31st of any year into the Assiniboine River via the existing Hammercrest Creek and an Oxbow in accordance with the proposal filed under The Environment Act on January 27, 2016; additional information provided on July 19, 2016, and Notice of Alteration dated March 29, 2022, and subject to the following specifications, limits, terms, and conditions:

DEFINITIONS

In this licence,

"accredited laboratory" means an analytical facility accredited by the Standards Council of Canada (SCC), or accredited by another accrediting agency recognized by Manitoba Environment and Climate 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;

"affected area" means a geographical area, excluding the property of the development;

"approvals branch" means the Environmental Approvals Branch of Manitoba Environment and Climate, or any future branch responsible for issuing licences under The Environment Act;

"approved" means approved by the director or an assigned environment officer in writing;

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

"base" means the exposed and finished elevation of the bottom of any cell of the wastewater treatment lagoon and of the wetland treatment cell;

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

"biosolids" means accumulated organic solids, resulting from wastewater treatment processes, that have received adequate treatment to permit the material to be recycled;

"buffer" means a strip of land that is managed to reduce or eliminate the impacts of land use practices on sensitive areas or natural features;

"day" means any 24-hour period;

"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;

"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;

"final discharge point" means the outlet of the wastewater treatment facility at which effluent monitoring can be located;

"five-day biochemical oxygen demand (BOD₅)" means that part of the oxygen demand usually associated with biochemical oxidation of organic matter within 5 days at a temperature of 20°C;

"five-day carbonaceous biochemical oxygen demand (CBOD₅)" 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;

"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;

"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, 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;

"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;

"record drawings" means engineering drawings complete with all dimensions which indicate all features of the wastewater disposal system as it has actually been built;

"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;

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

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

"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;

"thirty-day rolling average" means the arithmetic average of any daily reported data plus the preceding 29 consecutive days of reported data;

"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;

"total residual chlorine" means the sum of free chlorine and combined chlorine, including inorganic chloramines;

"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;

"wastewater treatment lagoon" means the component of this development which consists of an impoundment into which wastewater is discharged for treatment and storage as well as includes a wetland treatment cell which consists of an impoundment into which wastewater is discharged for nutrient reduction treatment.

GENERAL TERMS AND CONDITIONS

1. The licensee shall at all times maintain a copy of this licence at the development or at the premises from which the development's operations are managed.
2. The licensee shall direct all wastewater generated within Maxwell Colony toward the wastewater treatment lagoon system or other approved wastewater treatment facilities.
3. In addition to any of the limits, terms, and conditions specified in this licence, the licensee 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;
 - c) conduct specific investigations in response to the data gathered during environmental monitoring programs; or
 - d) 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.

4. The licensee shall submit all information required to be provided to the director or environment officer under this licence, in writing, in such form (including number of copies), and of such content as may be required by the director or environment officer, and each submission shall be clearly labelled with the licence number and file number associated with this licence.
5. The licensee 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.
6. The licensee shall actively participate in any future watershed-based management study, plan and/or nutrient reduction program, approved by the director, for the Assiniboine River, and/or associated waterways and watersheds.

SPECIFICATIONS, LIMITS, TERMS AND CONDITIONS

Construction - General

7. The licensee 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(s) of construction and the name(s) of the contractor(s) responsible for the construction.
8. The licensee shall comply with the requirements of The Heritage Resources Act, and suspend construction and immediately notify the Historic Resources Branch if heritage resources are encountered during the construction of the development.
9. The licensee shall:
 - a) conduct all ditch related work activities during no flow or dry conditions and not during the April 1 to June 15 fish spawning and incubation period;
 - b) not construct the wastewater treatment lagoon or wastewater collection system during periods of heavy rain;
 - c) place and/or isolate all dredged and construction material where it will not erode into any watercourse;
 - d) 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;
 - e) routinely inspect all erosion and sediment control structures and immediately complete any necessary maintenance or repair;
 - f) revegetate soil exposed during the construction of the development with native or introduced grasses or legumes. Native species shall be used to revegetate areas where native species existed prior to construction; and
 - g) use rock that is free of silt and clay for riprap.

10. The licensee shall, during construction of the development, operate, maintain, and store all materials and equipment in a manner that prevents any deleterious substances (fuel, oil, grease, hydraulic fluids, coolant, paint, uncured concrete, and concrete wash water, etc.) from entering the wastewater treatment lagoon, the discharge route, and associated watercourses, and have an emergency spill kit for in-water use available on site during construction.
11. The licensee 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 the Waste Management Facilities Regulation, or any future amendment thereof, or a licence issued pursuant to The Environment Act.
12. The licensee shall locate all 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 the Storage and Handling of Petroleum Products and Allied Products Regulation, or any future amendment thereof.
13. The licensee shall, during construction and maintenance of the development, prevent the introduction and spread of foreign aquatic and terrestrial biota by cleaning equipment prior to its delivery to the site of the development in accordance with the requirements of the Aquatic Invasive Species Regulation, or any future amendment thereof.
14. The licensee 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.

Construction - Clay Soil Liner

15. The licensee shall, prior to the construction of the dykes of the wastewater treatment lagoon and the wetland treatment cell:
 - a) remove all organic topsoil from the area where the wastewater treatment lagoon 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.
16. The licensee 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 metre in thickness;
 - c) the liners shall have a hydraulic conductivity of 1×10^{-7} centimetres per second or less at all locations;
 - d) the liner shall be constructed to an elevation of 2.5 metres above the floor elevation of the primary and secondary cells.

17. The licensee shall arrange with the designated environment officer of the approvals branch 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, unless otherwise approved by the environment officer of the approvals branch.
18. The licensee shall take and test undisturbed soil samples, in accordance with Schedule "A" attached to this licence, 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 of the approvals branch up to a maximum of 20 samples.
19. The licensee shall, not less than 2 weeks before the wastewater treatment lagoon is placed in operation, submit for the approval of the environment officer of the approvals branch the results of the tests carried out pursuant to clause 18 of this licence.

Record Drawings

20. The licensee shall:
 - a) prepare "record drawings" for the development and shall label the drawings "Record Drawings"; and
 - b) provide to the director, within four months of the environment officer's approval of the reports required by clause 19 of this licence, one electronic copies of the "record drawings".

Breakdown or Process Upset Reporting

21. The licensee shall, in the case of physical or mechanical equipment breakdown or process upset where such breakdown or process upset results or may result in the release of a pollutant in an amount or concentration, or at a level or rate of release, that causes or may cause a significant adverse effect, immediately report the event by calling the 24-hour environmental accident reporting line at 204-944-4888 (toll-free 1-855-944-4888). The report shall indicate the nature of the event, the time and estimated duration of the event and the reason for the event.
22. The licensee shall, following the reporting of an event pursuant to clause 21:
 - a) identify the repairs required to the mechanical equipment;
 - b) undertake all repairs to minimize unauthorized discharges of a pollutant;
 - c) complete the repairs in accordance with any written instructions of the director; and
 - d) submit a report to the director about the causes of breakdown and measures taken, within one week of the repairs being done.

Maintenance

23. The licensee shall, if in the opinion of the director or environment officer, significant erosion of the interior surfaces of the dykes occurs, repair the dyke to the satisfaction of the environment officer. Upon approval of the environment officer, install riprap as necessary. The riprap shall be placed 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.

24. The licensee shall provide and maintain a grass cover on the dykes of the wastewater treatment lagoon and the wetland treatment cell and shall regulate the growth of the vegetation so that the height of the vegetation does not exceed 0.3 metres on all dykes.
25. The licensee shall annually remove by mechanical methods all reeds, rushes, and trees located above the low water mark in the primary cell and the secondary cells of the wastewater treatment lagoon.
26. The licensee shall implement an ongoing program to remove burrowing animals from the site of the wastewater treatment lagoon and the wetland treatment cell.

Operation - General

27. The licensee shall obtain and maintain classification of the development pursuant to the Water and Wastewater Facility Operators Regulation 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.
28. The licensee shall carry out the operation of the development with individuals properly certified to do so pursuant to the Water and Wastewater Facility Operators Regulation or any future amendment thereof. In the event that the development is reclassified pursuant to the Regulation, the licensee shall provide a development plan to the director to have certified operator(s) upgrade their certification.

Operation - Wastewater Treatment Cells

29. The licensee 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;
 - b) the depth of liquid in the primary and the secondary cells does not exceed 1.5 metres; and
 - c) a minimum freeboard of 1.0 metres is maintained in all cells at all times.
30. The licensee 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.

Operation - Effluent Discharge

31. The licensee shall not discharge effluent from the wastewater treatment lagoon:
 - a) where the organic content of the effluent, as indicated by the five day carbonaceous 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 coliform content of the effluent, as indicated by the fecal coliform content measured by the MPN index, is in excess of 200 per 100 millilitres of sample;

- d) where the unionized ammonia content of the effluent is in excess of 1.25 milligrams per litre expressed as nitrogen (N), at $15^{\circ}\text{C} \pm 1^{\circ}\text{C}$;
- e) the total phosphorus content of the effluent is in excess of 1.0 milligram per litre, as determined by the thirty-day rolling average;
- f) between the 1st day of November of any year and the 15th day of June of the following year;
- g) when flooding from any cause is occurring along the discharge route; or
- h) when the discharge of effluent will cause or contribute to flooding in or along the discharge route.

Operation - Disinfection

32. The licensee shall, when chlorine is used as a disinfecting agent:
- a) notify the environment officer in advance;
 - b) dechlorinate effluent prior to discharge;
 - c) obtain grab samples prior to and daily during the discharge period and have them analyzed for total residual chlorine; and
 - d) not discharge effluent where the concentration of the total residual chlorine is in excess of 0.02 milligrams per litre.

MONITORING AND REPORTING SPECIFICATIONS

33. The licensee 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) carry out all sampling of, and preservation and analyses on, soil, compost, and air samples in accordance with methodologies approved by the director;
 - c) have all analytical determinations undertaken by an accredited laboratory; and
 - d) 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.

Operating Depth and Freeboard Non-Compliance Events

34. The licensee shall immediately notify the director each time the operating depth of any cell of the wastewater treatment lagoon does not comply with the maximum operating depth and minimum freeboard requirements for that cell as specified in clause 29 of this licence.
35. The licensee shall, if reporting is required pursuant to clause 34 of this licence in two consecutive years:
- a) Engage the services of a qualified consultant, acceptable to the director, to undertake an investigation of the development and related infrastructure, to determine the ability or inability of the existing system to meet the hydraulic loading capacity of the community. The investigation shall include but not be necessarily limited to:
 - i) diagnosis of the cause(s) of the recent exceedances of maximum operating depth;

- ii) sources of infiltration into the wastewater system including the municipal infrastructure;
 - iii) current hydraulic loading of the system;
 - iv) lack of storage capacity due to sludge build-up within existing cells;
 - v) the organic loading on the primary cell in terms of the five day biochemical oxygen demand; and
 - vi) operating procedures;
- b) Provide to the director, within four months of the notification given pursuant to clause 34 an engineering report describing in detail the results and observations concluded by virtue of the investigation; and
- c) Provide to the director, within four months of the report provided pursuant to sub-clause b) of this section, a remedial action plan in the form of a detailed engineering report describing recommended modifications, repairs, or upgrading works to overcome excessive hydraulic loading of the system.

Effluent Monitoring

36. The licensee shall, during each effluent discharge campaign, obtain grab samples of the treated wastewater at the outlets of the secondary cells being discharged at the commencement of each discharge campaign and once each month during the campaign with at least fifteen days between each monthly sampling event, and have the grab samples analyzed for:
- a) the organic content as indicated by the five-day carbonaceous biochemical oxygen demand and expressed as milligrams per litre;
 - b) the total suspended solids content expressed as milligrams per litre;
 - c) the fecal coliform content as indicated by the MPN index and expressed as MPN per 100 millilitres per sample; and
 - d) the unionized ammonia nitrogen content expressed as milligrams per litre.
37. The licensee shall, during each effluent discharge campaign, obtain grab samples of the treated wastewater at the outlet of the constructed wetland treatment cell:
- a) at the commencement of the discharge campaign;
 - b) during the first summer discharge period, once each week during the discharge campaign with at least four days between each weekly sampling event;
 - c) have each grab sample analyzed for total phosphorus content expressed as milligrams per litre; and
 - d) determine a thirty-day rolling average based on the results of the analyses of not fewer than three grab samples.
38. The licensee shall during each year maintain the following records and retain them for a minimum period of five calendar years:
- a) reports of visual inspections conducted a minimum of once per month;
 - b) wastewater sample dates;
 - c) original copies of laboratory analytical results of the sampled wastewater;
 - d) a summary of laboratory analytical results;
 - e) cell isolation dates (i.e., valve operation records);
 - f) effluent discharge dates;
 - g) estimated effluent discharge volumes;

- h) maintenance and repairs;
 - i) expansions to the collection system with associated capacity assessment;
 - j) updated organization charts identifying all certified operators, including backup operators; and
 - k) a summary of any wastewater collection system overflows.
39. The licensee shall submit an annual report to the environment officer by February 28 of the following year including all records required by clause 38 of this licence.
40. The licensee shall, during the first year of operation of the development following the issuance of this licence that a discharge must occur, obtain and analyze grab samples of the effluent during each effluent discharge campaign and report the results of the analysis in accordance with Schedule "B" attached to this licence.

DECOMMISSIONING OF EXISTING WASTEWATER TREATMENT LAGOON

41. The licensee shall, immediately after placing the development into operation after successful commissioning, prevent any additional wastewater or septage from being discharged into the existing wastewater treatment lagoon.
42. The Licencee shall, within six months of placing the development into operation, submit to the Director for approval, a report containing an assessment of options and update the proposed plan for decommissioning of the existing wastewater treatment lagoon for the Maxwell Colony located on River Lots 104 Parish of St. Francois Xavier in the Rural Municipality of Cartier as described in the letter on July 19, 2016.
43. The Licencee shall, within two years of receiving approval by the Director of a plan to decommission the existing wastewater treatment lagoon for the Maxwell Colony located on River Lots 104 Parish of St. Francois Xavier in the Rural Municipality of Cartier, complete such decommissioning in accordance with the approved plan and any limits, terms, and conditions identified by the director.

Biosolids land application

44. The licensee shall, during all biosolids land application activities, comply with the requirements of the Nutrient Management Regulation or any future amendment thereof.
45. The licensee shall dispose of biosolids:
- a) by application to agricultural land in accordance with the requirements of this licence; or
 - b) in the event of an emergency situation and with the approval of the director, at a waste disposal ground in accordance with its permit or licence.
46. The licensee shall apply the biosolids only to agricultural lands approved by the director.

47. The licensee shall:
- a) apply biosolids to the identified agricultural land by incorporating it into the soil a minimum of 15 centimetres below the soil surface within 48 hours of application; and
 - b) complete the incorporation of the biosolids such that it is acceptable to an environment officer.
48. The licensee shall apply biosolids such that the amounts of residual nitrate-nitrogen in the 0 - 60 centimetres soil depth and Olsen-P phosphorus in the 0 - 15 centimetres soil depth do not exceed the limits of the most limiting Nutrient Management Zone, regardless of size, set forth in the Nutrient Management Regulation under The Water Protection Act or any future amendment thereof.
49. The licensee shall not apply biosolids:
- a) between November 10th of any year and April 10th of the following year, unless otherwise authorized in writing by the director;
 - b) to frozen soil;
 - c) less than 300 metres from any occupied residence (other than the residence occupied by the owner of the land on which the biosolids are to be applied);
 - d) less than 1 kilometre from a residential area;
 - e) less than 8 metres from a major wetland, bog, marsh or swamp;
 - f) less than 15 metres from a first order waterway;
 - g) less than 30 metres from a second, third or fourth order waterway and less than 90 metres from any other waterway;
 - h) less than 50 metres from any groundwater well; or
 - i) on land that is subject to flooding.
50. The licensee shall not apply biosolids on land:
- a) with a depth of clay or clay till of less than 1.5 metres between the soil surface and the water table;
 - b) within 100 metres of an identifiable boundary of an aquifer which is exposed to the ground surface;
 - c) where, prior to the application of biosolids, the soil pH is less than 6.0;
 - d) where the surface slope of the land is greater than five per cent;
 - e) where, prior to the application of biosolids, the concentration of sodium bicarbonate extractable phosphorous, as P, exceeds 60 micrograms per gram in the upper 15 centimetres of the soil.
51. The licensee shall not allow cattle to pasture on land on which biosolids have been applied, for a period of three years from the date of application of the biosolids. For application on land not owned by the licensee, this requirement shall be included in any agreement between the licensee and the landowner.
52. The licensee shall, on all agricultural land onto which biosolids have been applied, plant one of the following crops at the commencement of the next growing season following such application and for a period of three years from the date of application of biosolids:
- a) a cereal crop;
 - b) a forage crop;
 - c) an oil seed crop;

- d) field peas; or
- e) lentils.

For application on land not owned by the licensee, this requirement shall be included in any agreement between the licensee and the landowner.

53. The licensee shall apply biosolids onto agricultural land such that the cumulative weight per hectare of each heavy metal in the soil, as calculated by adding the amount of each heavy metal in the biosolids applied to the background level of the same metal, does not exceed the following levels: *

<u>Metal</u>	<u>Kilogram per Hectare</u>
Arsenic	21.6
Cadmium	2.5
Chromium (total)	115.2
Copper	113.4
Lead	126
Mercury	11.9
Nickel	90
Zinc	360

* Calculated values shall be based on a soil bulk density of 1200 kilograms per cubic metre and a soil depth of 15 centimetres. Analysis for heavy metals shall be carried out in accordance with Schedule "D" of this Licence.

Monitoring and reporting specifications respecting land application

54. The licensee shall submit to the director and the respective municipal authority, at least two months prior to each intended application of biosolids to land events, the legal descriptions for all land on which biosolids are to be applied in the current calendar year.
55. The licensee shall at least two months prior to each intended application of biosolids to land events, provide a public notice to advise local residents of the location and approximate size of the land areas intended to be used as biosolids land application sites in the prevailing calendar year, to the satisfaction of the assigned environment officer.
56. The licensee shall develop and carry out a biosolids sampling and analysis program, acceptable to the director, to determine the volume of the biosolids removed on a daily basis and the volume of biosolids applied to each field. The licensee shall make this information available to an environment officer on request.
57. The licensee shall conduct a monitoring and analysis program that is acceptable to the director, and in accordance with Schedules "C" and "D" of this licence to determine:
- a) the composition of the biosolids;
 - b) the background levels of selected soil parameters for each parcel of land;
 - c) the surface slope of each parcel of land;
 - d) the presence of clay or clay till to a depth of 1.5 metres for each parcel of land;

- e) whether metals-based, phosphorus-based, or nitrogen-based application limits are most appropriate for field-specific application rates for the lands on which the biosolids are to be applied; and
 - f) the crops grown on land on which biosolids have been applied during the previous 3-year period.
58. The licensee shall during each year maintain the following records and retain them for a minimum period of five calendar years:
- a) details of the biosolids land application programs carried out during the calendar year including:
 - i) a description of each parcel of land on which biosolids were applied;
 - ii) the background levels of soil parameters as listed in Schedule "C" of this Licence, for each parcel of land;
 - iii) the dry weight of biosolids applied per hectare;
 - iv) the weight of each heavy metal, in milligrams per kilogram of soil, added to each parcel of land for the metals listed in Schedule "C" of this Licence; and
 - v) the cumulative weight, in kilograms per hectare, of each heavy metal for each parcel of land as calculated by adding the amount of each heavy metal applied to the background level of the same metal;
 - b) the amount of nitrogen, phosphorus, and potassium which was added per hectare for each parcel of land;
 - c) the results of analysis of the biosolids and soil required by this licence; and
 - d) a copy of the analytical procedures used and the results of analysis of reference materials in accordance with Schedule "D" of this Licence.
59. The licensee shall undertake annual post-harvest soil testing of each field for Nitrate-N (0 – 60 centimetres) and phosphorus using the Olsen-P test (0 – 15 centimetres) for 3 years following biosolids application and maintain the records of the test results. Additionally, the Licensee shall maintain information from the producer regarding cropping and the amounts of nutrients from other sources (fertilizer, manure, etc.) being added to the field and an estimate of the crop yield in kilograms per hectare.
60. The licensee shall include in the annual report submitted to the environment officer under clause 39 all records required by clauses 58 and 59 of this Licence.

Alterations

61. The licensee shall notify the director and receive the approval of the director for any alterations to the development as licensed, prior to proceeding with such alterations.

REVIEW AND REVOCATION

- A. If, in the opinion of the director, the licensee has exceeded or is exceeding or has failed 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, 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 or request the filing of a Notice of Alteration.

Original Signed By
Agnes Wittmann
Director
The Environment Act

Figure 1 - Maxwell Hutterian Mutual Corporation Wastewater Treatment Lagoon Licence No. 3402



Schedule "A" to Environment Act Licence No. 3402

Liner Sampling and Testing Requirements Pursuant to Clause 18

Soil Sampling:

1. The licensee 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 licensee 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 licensee 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 and weathered soils.
5. The licensee 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 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.

Schedule "A" to Environment Act Licence No. 3402 (cont'd)

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.

Schedule "B" to Environment Act Licence No. 3402

Initial Characterization of Wastewater Pursuant to Clause 40

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); and
2. Determine the temperature of each sample at the time of sampling.

Effluent Analysis:

1. For each grab sample, have the grab sample analysed 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 *Escherichia coli* (*E. Coli*) content as indicated 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) if chlorine was used as a disinfecting agent, total residual chlorine expressed as milligrams per litre;
 - h) total ammonia nitrogen expressed as milligrams per litre;
 - i) nitrate-nitrite nitrogen expressed as milligrams per litre;
 - j) total Kjeldahl nitrogen (TKN) expressed as milligrams per litre;
 - k) dissolved phosphorus expressed as milligrams per litre;
 - l) total phosphorus expressed as milligrams per litre; and
 - m) 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.

Schedule "C" to Environment Act Licence No. 3402

Biosolids and Soil Sampling Requirements Pursuant to Clauses 57 and 58

Biosolids

A representative sample of biosolids shall be collected from each cell from which biosolids will be removed for land application. A representative sample of biosolids from each cell shall be a composite of biosolids samples taken from a minimum of 5 locations distributed over the area of that cell.

1. The sample of biosolids shall be analyzed for the following parameters:*

- | | |
|----------------------------|--------------|
| a. conductivity | j. lead |
| b. pH | k. mercury |
| c. total solids | l. nickel |
| d. volatile solids | m. potassium |
| e. nitrate nitrogen | n. cadmium |
| f. total Kjeldahl nitrogen | o. copper |
| g. ammonia nitrogen | p. zinc |
| h. organic nitrogen | q. chromium |
| i. total phosphorus | r. arsenic |

* Analysis for heavy metals must be carried out in accordance with Schedule "B" of this licence.

Soil

1. Composite samples from each field onto which biosolids will be applied shall be taken prior to application of biosolids. Each field of twenty-four hectares or less shall be sampled from a minimum of twelve representative sites or a minimum of one sample site per two hectares for larger fields. Each sample site shall be sampled from 0 to 15 centimetres and from 0 to 60 centimetres. The entire core extracted for each sample shall be collected. All samples from similar depths within a field shall be bulked in one container for thorough mixing prior to analysis yielding two samples per field.

2. Soil samples from 0 to 15 centimetres shall be analyzed for the following: *

- | | |
|--|-------------|
| a. pH | g. cadmium |
| b. potassium | h. chromium |
| c. nickel | i. copper |
| d. mercury | j. lead |
| e. zinc | k. arsenic |
| f. sodium bicarbonate extractable phosphorus, as P | |

* Analysis for heavy metals must be carried out in accordance with Schedule "B" of this licence.

3. Soil samples from 0 to 60 centimetres shall be analyzed for the following:

- | | |
|---------------------|-------------------|
| a. nitrate nitrogen | b. total nitrogen |
|---------------------|-------------------|

Crops

1. The type of crop grown on lands on which biosolids have been applied during the previous 3-year period shall be listed along with the legal description of the land and the date of application of biosolids.

Schedule "D" to Environment Act Licence No. 3402

Metals Analysis Requirements Pursuant to Clauses 53, 57, 58

The analysis for all metals shall be carried out in accordance with the following requirements:

1. The laboratory performing these analyses shall:
 - a) possess and maintain accreditation with the Canadian Association for Laboratories Accreditation Inc. (CALA) and/or the Standards Council of Canada (SCC);
 - b) operate a quality assurance program acceptable to the assigned environment officer;
 - c) monitor the accuracy of the sludge and soil analyses for each set of ten or less samples of sludge or soil through the use of a suitable reference material acceptable to the assigned environment officer; and
 - d) analyze field duplicates of samples based on a frequency of one in each set of ten or less field samples and that the acceptance criteria for duplicate analysis should be within ± 10 percent.

2. A copy of the analytical procedures and the analytical results for associated reference materials used in the laboratory, and any other controls used in the analysis, shall be submitted with the field sample results.

3. If the analytical results of any associated reference materials do not meet the following criteria, the soil and/or sludge samples must be re-analyzed:

- Arsenic	± 35 percent from the reference value
- Cadmium	± 25 percent from the reference value (for values above 1 $\mu\text{g/g}$)
- Cadmium	± 35 percent from the reference value (for values below 1 $\mu\text{g/g}$)
- Chromium	± 25 percent from the reference value
- Copper	± 25 percent from the reference value
- Lead	± 25 percent from the reference value
- Mercury	± 35 percent from the reference value
- Nickel	± 25 percent from the reference value
- Zinc	± 25 percent from the reference value