

SUMMARY OF COMMENTS/RECOMMENDATIONS

PROPONENT: Can-Am Properties Ltd.
PROPOSAL NAME: Wastewater Treatment System
CLASS OF DEVELOPMENT: 2
TYPE OF DEVELOPMENT: Sewage Treatment Plant
CLIENT FILE NO.: 5256.00

OVERVIEW:

On February 15, 2007, the Department received an Environment Act Proposal (EAP) for the installation and operation of a wastewater treatment system for the CanAm Colony. The proposed wastewater treatment system will consist of a package extended aeration sewage treatment plant that will be located on SW 28-5-18WPM in the Rural Municipality of Riverside, a sewage collection system, a lift station, and a treated wastewater disposal field that will be located on NW 28-5-18WPM.

The Department, on February 27, 2007, placed copies of the EAP report in the Public Registries located at 123 Main St. (Union Station), the Winnipeg Public Library, the Lakeland Regional Library and the Manitoba Eco-Network and provided copies of the EAP report to the Canadian Environmental Assessment Agency (CEAA), the Clean Environment Commission, and TAC members. As well, the Department placed public notifications of the EAP in the Killarney Guide on Friday, March 2, 2007. The newspaper and TAC notifications invited responses until March 30, 2007.

On April 13, 2007 Manitoba Conservation forwarded requests for additional information from the TAC to the proponent. The proponent's June 4, 2007 response to the requests was then provided to the participating TAC for review and comment on July 5, 2007. There were no further comments or requests for additional information by the TAC.

On November 29, 2007, additional information regarding; the specific daily BOD₅ loading for the wastewater treatment system; planned methods for management and disposal of sludge from the sewage treatment plant; and effluent nitrogen concentrations was requested from the proponent's consultant. On August 13, 2008, Manitoba Conservation received responses to these requests. The information has been incorporated to the draft Licence.

COMMENTS FROM THE PUBLIC:

There were no comments from the public.

COMMENTS FROM THE TECHNICAL ADVISORY COMMITTEE:

Sustainable Resource & Policy Management Branch – Conservation

- *The proposal indicates that the effluent disposal field for the proposed wastewater treatment plant is currently grass covered and is not used by the colony for agricultural purposes. If this is native prairie, the proponents should contact the Conservation Data Centre (CDC) to determine if there are any records of rare or endangered species within or near the project area. The proponent should be aware that since many areas of the province have not been thoroughly surveyed, the absence of data in the CDC database in any particular geographic area does not necessarily mean that species or ecological communities of concern are not present. The information should therefore not be regarded as a final statement on the occurrence of any species of concern nor can it substitute for on-site surveys for species that will be impacted by the development. It is the responsibility of the proponent to inspect the project area prior to and during construction to determine if any rare or endangered species may be impacted. The proponent needs to be aware that if rare or endangered species are present, removal or destruction of individuals or their habitat may be in contravention of Subsection 10(1) “Prohibition” of The Endangered Species Act (Manitoba). In addition, the federal Species at Risk Act prohibits any activities that kill or otherwise harm COSEWIC-listed plant or animal species and prohibits destruction of habitat for these species. If species of concern are present, the proponent must contact the Biodiversity Conservation Section of the Wildlife and Ecosystem Protection Branch to discuss possible mitigation options well in advance of any disturbance; and*
- *It is recommended that the proponent use a seed mix of native grasses and forbs when re-vegetating disturbed areas that currently have native vegetation.*

Proponent Responses – June 4, 2007:

- While the area is not currently used for agricultural purposes it has been previously cultivated and therefore is not considered to be native prairie. The Colony will sow a mixture of native grasses when re-vegetating the area disturbed by the installation of the pipeline and disposal field.

Environmental Operations – Conservation

- *This proposal does not supply information from the geotechnical investigation by J.R. Cousins which was used to determine soil type. It is recommended this information be included. This would include but not be limited to:*
 - *laboratory soil analysis results*
 - *number of well drill holes reviewed and where*
 - *year and scope of investigation;*

- *The hydraulic loading is based on meter reading of 13,000L for current population of 64 (4.6.1 Hydraulic Loading). Recommend provide daily meter readings for at least one month to determine this loading;*
- *The report does not provide information on colony activities. Is all sewage from residential buildings?*
 - *commercial kitchens should have grease traps and other building which may generate grease, oil and foam should be identified as the MicroFAST system does not have a 'skimmer in the primary zone to remove greases, oils and foam' (Appendix E Treatment Process Brief Description). I don't see any collection tanks before the MicroFAST System that have any mechanism to remove this material;*
- *Recommend the Environment Act License specify limits for proposed sampling criteria the report has identified in section 4.8.2, Monitoring Requirements (BOD, TSS and Total/Fecal Coliform). License may require monitoring of Total Nitrogen/Phosphorus since the MicroFAST System has treatment criteria for these parameters. Also a clear procedure should be established for failed results including re-sampling, maintenance or replacement;*
- *Critical installation and testing procedures should be identified by the Environment Act License and inspection authority should be identified. This may include Environmental Operations being identified to be notified of date and time for the squirt test and prior to the installation and cover of the Infiltrator Quick4 Standard Chambers;*
- *This office has a concern on the use of an area field due to size of this field. The thought is a field this size should be using a trench system or at least have the 6 dousing fields separated. The separation distance could be 6.5' (recommend trench spacing, pg 10 of Infiltrator Manual) or double the spacing to 13' which would allow for complete replacement of a field area in the future. Normally area fields are raised and have sloped side walls to allow aeration along the sides however in a field 30x50m this element would be lacking. Plans submitted are lacking this detail; and*
- *Specifications and drawing are not detailed on pressure system in regard to the disposal field specifically orifice size & spacing of the pressurized distribution pipe inside the Infiltrator chamber.*

Proponent Responses – June 4, 2007:

- Copies of the test hole locations, test hole logs and laboratory test results from the geotechnical investigation completed by J. R. Cousin Consultants in November, 2004 have been attached to this response. This investigation was conducted in order to assess the suitability of the site where the infiltration field is to be located for a wastewater treatment lagoon. Six test holes were drilled at the proposed site as well as three particle size analyses and one hydraulic conductivity test. Please note that Wellwood Colony is the parent colony of CanAm Colony. The investigation was conducted prior to the formal establishment of CanAm Colony.

- As stated in the report under section 4.6.1 the average daily water consumption is currently 13,000 L. This average was obtained from daily meter readings over a one week period.
- All of the wastewater treated and disposed of with this system is generated by domestic uses. The colony kitchens have grease traps installed to prevent oil and grease from entering the sewer system.
- See point above.
- The wastewater treatment system is designed to utilize a field to dispose of the treated effluent. The disposal field has been sized according to the soil conditions on site such that it will not become saturated under normal operating conditions. Furthermore, we have reviewed the design of the field with the manufacturer (Dennis Hallahan, Technical Director of Infiltrator Systems Inc.) and have been informed that this is a typical application and that the design meets their requirements as shown in the attached email.
- The pressure system is detailed in the project drawings SEI2006-138 on drawing C4. The orifice size is specified at 3.2 mm diameter spaced at 1500 mm.

Disposition:

- The draft Environment Act Licence contains a clause requiring that the Licencee notify the assigned Environment Officer prior to beginning construction of the sewage treatment plant and disposal field and that the notification must include the intended starting date of construction and the name of the Licencee's contact person at the construction site.
- The draft Environment Act Licence contains a clause requiring that the Licencee not cover the equalization tank, the sewage treatment plant or the engineered disposal field, in a manner that obscures them from view or interferes with inspection of the tank, plant or field, without authorization from the assigned Environment Officer.
- The draft Environment Act Licence contains a clause requiring that the Licencee install, operate and maintain the effluent disposal field such that effluent is discharged through the disposal field in the manner for which the disposal field was designed.

Health

- *The need for fencing, gates and warning signs should be included in the license to ensure public safety, in case of unsupervised public access to the development.*
- *Consideration of inclusion of odor nuisance clause.*
- *Please ensure that any discharge of effluent is in compliance with Manitoba Environment's guidelines.*

- *Please ensure containment design provides the best possible groundwater protection for the area.*
- *Consideration of leachate monitoring.*

Disposition:

- The draft Environment Act Licence contains a clause requiring that the proponent provide a fence to limit access to areas of the sewage treatment plant that are not buried or enclosed within secured buildings;
- The draft Environment Act Licence contains a clause stating that 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;
- The draft Environment Act Licence contains limits regarding effluent quality regarding biochemical oxygen demand and total suspended solids of the effluent that are within Tier 1 Water Quality Standards for municipal wastewater effluents as presented in *Manitoba Water Quality Standards, Objectives and Guidelines*;
- The draft Environment Act Licence specifies that only wastewater as defined in the Licence is discharged into the sewage treatment plant.

Historic Resources Branch – Culture, Heritage and Tourism

- *No concerns.*

Infrastructure and Transportation

- *No concerns.*

Intergovernmental Affairs

- *This area of the rural municipality is zoned “A” Rural District and allows for a range of agricultural land uses including colonies;*
- *This is a fairly new Hutterite colony in terms of the residential aspects while the farm industrial uses (i.e. metal plant) has been established for a few years.*
- *The “A” zone treats dwellings and associated structures (such as the new sewage lagoon) as accessory land uses both of which would normally be approved through a development permit issued by the RM.*
- *The site of the new lagoon appears to be well chosen in terms of the separation distances to nearby farm dwellings -- the closest residence not part of the colony is located almost one mile to the southeast on the SE quarter of the same section.*
- *The Deloraine Office of the CPS Branch has no concerns with the proposed development in the RM of Riverside.*

Ecological Services Division – Water Stewardship

- *A permit may be required for alteration or diversion of any watercourses found on the land.*
- *Can the reliability of the MicroFAST system to treat wastewater effluent to acceptable limits be supported by any examples of successful use in southern Manitoba? Can cold weather performance be verified by other examples of use?*
- *The colony is proposing to use a packaged wastewater treatment plant and associated effluent disposal infiltration field that is reported to be effective when properly maintained. However, no details are provided with respect to maintenance of the treatment plant or the disposal field. Will maintenance be the responsibility of the colony and if so, how often will inspections and maintenance occur? What training will be provided and what support is available for issues that may occur? If maintenance is to be contracted, what is the proposed schedule for maintenance and what support is available during emergencies (system freeze up, etc.)?*
- *Has a contingency plan been developed in the event that the disposal field becomes saturated or frozen?*
- *The consumption rate of 200 L/day per person is slightly lower than the typical average of 225 L/day. In addition, the population growth to 90 persons is slightly less than the typical maximum colony size of 100 to 150 people. Additional rationale for these assumptions should be provided.*
- *The ortho photo provided indicates a vegetated area that includes a first order drain that would be traversed by the 4" PVC pipe leading to the effluent disposal field. The area is also classified as a Zone N4 under the proposed Nutrient Management Regulation under The Water Protection Act due to steepness and erodability of the slope. How does the proponent propose to deal with this potentially sensitive area?*
- *I would recommend that monitoring of effluent quality occur monthly for the first two years of use for the following variables:*
 - *Escherichia coli or fecal coliform*
 - *Total phosphorus*
 - *Total kjeldahl nitrogen*
 - *Ammonia nitrogen*
 - *Nitrate-nitrite nitrogen*
 - *CBOD*
 - *Total suspended solids*
 - *pH*
- *If the treatment plant performs as projected for the first two years then monitoring could be reduced to quarterly.*
- *The proponent should also provide a proposal for monitoring the performance of the disposal field with respect to seepage.*

Proponent Responses – June 4, 2007:

- The MicroFAST system has proven to be an effective means of treatment for domestic waste in all climates. The MicroFast system was NSF tested in Michigan USA during the winter where the average temperatures range from -5 to -10 °C. While this temperature is somewhat warmer than the temperatures experienced in southern Manitoba the system has proven to be effective in cold weather. The NSF testing was completed with the air blower unit being exposed to the environment circulating cold air throughout the MicroFAST system. There are numerous installations across western Canada that are currently utilizing the MicroFast system for domestic sewage treatment. We have attached to this response a copy of the NSF testing results along with a project reference list of current installations in western and northern Canada as well as Alaska for review.

The NSF testing results show the following average reductions:

	<u>Influent</u>	<u>Effluent</u>
BOD ₅ :	144 mg/L	9 mg/L
TSS:	197 mg/L	7 mg/L
VSS:	159 mg/L	6 mg/L
Temperature:	12°C	11°C
Ammonia-N:	26 mg/L	4 mg/L
Nitrate-N:	3.5 mg/L	2.6 mg/L
Total Kjeldahl-N:	34 mg/L	6.6 mg/L

- Maintenance required for the MicroFAST system includes monitoring the sludge level and removing the sludge from the system approximately once every year with a vacuum truck as well as periodically inspecting and maintaining the air pump. Instruction and training for maintenance and operation of the MicroFAST system will be provided during the installation of the system. The maintenance and operation will be the responsibility of the colony.

The maintenance required for the effluent disposal field includes maintaining a vegetative cover over the field in order to prevent soil erosion and to allow snow to be held over the system during the winter, insulating it and protecting it from freezing. Straw may also be utilized as a cover to provide additional insulation and protect from freezing during the winter. The system will also be monitored through the inspection ports to ensure the field is not saturated but is receiving effluent for treatment (see attached updated drawing SEI2006-138 C3).

- The potential of the field becoming either saturated or frozen is very low. The MircoFAST system will be pumping warm air from the plumbing shack into the treatment tanks. The warm air will maintain the liquid temperature well above freezing during treatment and just prior to being pumped to the field. In addition to the warm air input the colony lifestyle is such that there will never be vacation time when the field is not in use. There will always be a constant feed of warm effluent being pumped to the field that will provide sufficient latent heat and prevent freezing.

The field will also be vegetated to capture snow and provide cover, further insulating the field and protecting it from freezing.

The mounded design of the field will also minimize the potential of the field becoming saturated during periods of high precipitation. The mounded area will facilitate positive surface drainage away from the field preventing accumulation of precipitation within the field. The field has been appropriately sized and designed to accommodate the effluent from a population of 90 people.

Should the field become frozen or saturated a licensed septic hauler will be contracted to remove the waste from the lift station and transported to the nearest licensed lagoon for disposal.

- The consumption rate of 200 L/day per person is based on our experience along with historical data and industry adopted production rates for this type of application. It is our opinion that 200 L/day is a conservative estimate as traditionally wastewater treatment lagoons have been designed for 180 L/day per person for Hutterite Colonies. The treatment lagoon for CanAm Colony was designed and permitted for 180 L/day per person.

Can American Colony was established in 2005 and currently has a population of 46 people. The demographics are such that the growth rate will be slow for the next decade. As such Can American requested that the wastewater treatment system be designed to allow for future expansion. The modular design of the MicroFAST system accommodates this design constraint. The system is sized to allow expansion of up to 90 people at which time an EAP will be submitted to Manitoba Conservation for the modifications necessary to accommodate the installation of an additional treatment module.

- The 4" PVC pipeline will be installed from the wastewater treatment plant to the disposal field at approximately 8 feet below existing grade. The pipeline installation will follow the contour of the land and be installed with open cut techniques. This will result in the disturbance of a strip of soil approximately 20 to 30 feet wide. The pipeline will traverse the first order drain in the northwest corner of the section where the drain shallows to approximately 12 feet below the surrounding land elevation. This location was selected as it is the narrowest and shallowest location across the drain. Once the pipeline is installed the surface will be landscaped and sown with native grasses and forbs. Erosion protection will be utilized as required during and after construction until the vegetation is established.
- The EAP outlines sampling frequency and testing parameters in section 4.8.2 Monitoring Requirements. We propose that the testing schedule be increased to quarterly for the first two years and biannually thereafter. The testing parameters shall include BOD, TSS, total/fecal coliform, total nitrogen and total phosphorus.

In the event that the results from the sampling and testing are higher than expected, the sludge level as well as the operation of the air pump will be verified. The appropriate corrective action will then be taken as necessary and the effluent will be

re-sampled to ensure the operation of the system is within operating parameters. In the event that results from the second sampling fail and the plant operator cannot determine the cause the design engineer shall be contacted for further instruction.

- We are uncertain as to what seepage monitoring will achieve with an infiltration field. The effluent pumped to the disposal field will be treated to within the Manitoba Water Quality Standards, Objectives and Guidelines Tier 1 Water Quality Standards for municipal wastewater effluents. It is our opinion that the infiltration field is a secondary means of treatment that will be utilized to provide secondary treatment and to dispose of the treated effluent.

Disposition:

- The draft Environment Act Licence contains a clause requiring that the Licencee install, operate and maintain the effluent disposal field such that effluent is discharged through the disposal field in the manner for which the disposal field was designed and that freezing of the effluent in the disposal field is prevented.
- The draft Environment Act Licence contains a clause requiring that the Licencee have the construction and operation of the Development carried out by individuals properly trained and qualified to do so.
- The draft Environment Act Licence contains a clause requiring that 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 and have them analyzed for; fecal coliform content; total coliform content; total nitrogen; and total phosphorus and report the results to the Director.
- The draft Environment Act Licence contains a clause that identifies the maximum daily flow rate and the maximum organic loading for the sewage treatment plant over any 24-hour period;
- The draft Environment Act Licence contains a clause requiring that the Licencee not discharge effluent from the sewage treatment plant where BOD and TSS are in excess of specified limits;
- The draft Environment Act Licence contains a clause requiring that the Licencee take action to notify the Director of physical or mechanical breakdown of the Development and identify and complete required repairs.

COMMENTS FROM FEDERAL REPRESENTATION:

Canadian Environmental Assessment Agency

- *Based on the responses to the CEAA survey, application of The Canadian Environmental Assessment Act with respect to this proposal will not be required.*

Environment Canada and Health Canada would be able to provide specialist advice if requested.

PUBLIC HEARING:

A public hearing was not requested.

RECOMMENDATION:

Issue an Environment Act Licence in accordance with the attached draft. The Licence should be assigned to the Environmental Assessment and Licensing Branch until all inspections have been completed and the facility is fully commissioned in accordance with the Licence.

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