SUMMARY OF COMMENTS/RECOMMENDATIONS

PROPONENT:	**Rural Municipality of Hanover**
PROPOSAL NAME:	**Community of Mitchell Wastewater Treatment Lagoon**
CLASS OF DEVELOPMENT:	**2**
TYPE OF DEVELOPMENT:	**Wastewater Treatment Lagoon**
CLIENT FILE NO.:	**2693.10**

OVERVIEW:

On July 6, 2006, the Department received an Environment Act Proposal (EAP) on behalf of the Rural Municipality of Hanover for the construction and operation of a wastewater treatment lagoon to serve the Community of Mitchell and surrounding area. The wastewater treatment lagoon will be located in parts of SW and SE Section 12–7–5EPM. Treated wastewater from the wastewater treatment lagoon will be discharged to municipal ditching that flows into Chortitz Drain that drains into the Manning Canal that drains into the Seine River Diversion between June 15th and November 1st of any year. The existing wastewater treatment lagoon located in SW 1–7–5EPM currently serving the Community of Mitchell and surrounding area will be decommissioned.

On July 13, 2006 a letter identifying items that were either required or for which additional information is required. The proponent provided a response in an August 23, 2006 letter.

The Department, on September 6, 2006, placed copies of the EAP report in the Public Registries located at 123 Main St. (Union Station), the Winnipeg Public Library, the Jake Epp Public 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 Steinbach Carillon on Thursday, September 14, 2006. The newspaper and TAC notifications invited responses until October 12, 2006.

This EAP relates to the replacement of an existing wastewater treatment lagoon that is currently licenced under Environment Act Licence No. 1053.

On October 30, 2006, Manitoba Conservation forwarded requests for additional information from the TAC to the proponent. The proponent's November 29, 2006 response to the requests was then provided to the TAC for review and comment on January 11, 2007.

On February 5, 2007, Manitoba Conservation forwarded supplementary requests for additional information from the TAC to the proponent. The proponent's February 22, 2007 response to the requests was then provided to the TAC for review and comment on February 26, 2007.

There were no additional comments from the TAC.

COMMENTS FROM THE PUBLIC:

There were no comments from the public.

COMMENTS FROM THE TECHNICAL ADVISORY COMMITTEE:

Agriculture and Food

- *No concerns.*

Conservation

- *No concerns.*

Historic Resources

- *No concerns.*

Transportation and Government Services

- *No concerns.*

Water Stewardship

October 16, 2006

- *As the discharge route does involve fish bearing streams and ultimately enter into the Seine River Diversion water quality parameters should meet or exceed the Manitoba Water Quality Standards, Objectives and Guidelines. There should be some ongoing monitoring requirements for ammonia.*
- *Regarding discharge timing windows, discharge rate and construction works that could result in the addition of sediment to the drains, as long as DFO is involved in reviewing this proposal and manages fish habitat to meet the intent of their no net loss policy, provincial fisheries management interests should be met.*
- *There does appear to be some additional follow up sampling strongly recommended by the consultant (page 4 of the Geotechnical Report) prior to proceeding with a clay liner which should be reflected in the license.*

- *Locations of any potable water sources within the vicinity of the proposed sewage treatment plant were not mentioned. It is important to know whether the local population has access to treated water supply.*
- *According to section 5.2.1 and figure 2.1, the proposed lagoon location differs from the existing lagoon. As per the Public Health Act, Regulation 331/88R (waterworks, sewerage and sewage disposal regulation) sewer line extensions require certificate of approvals prior to construction. Please contact Office of Drinking Water.*
- *Sections 5.2.1 and 5.2.2 indicate that proposed primary and secondary cells will be designed with perimeter clay core. It is unclear whether any groundwater monitoring will be provided to check the integrity of the proposed cores.*
- *The proposed activities should not degrade the groundwater and surface water qualities on adjacent properties unsuitable for use as drinking water sources. The consultant should identify such activities and recommend appropriate mitigation measures if required.*
- *It is strongly recommended that the Community of Mitchell work with the City of Steinbach to develop a regional wastewater system rather than constructing a new facility. There will likely be a need in the near future to move to nutrient reduction and this can best be achieved through larger, centralized facilities. Regionalization of wastewater treatment provides opportunities for communities to implement more advanced treatment technologies at lower costs relative to meeting these needs on an individual basis. Our recommendation is consistent the Lake Winnipeg Stewardship Board's interim report to government (January 2005) that recommended promoting regionalization of wastewater treatment systems to optimize opportunities for nutrient removal. Several factors including proximity and costs make this an ideal opportunity for regional wastewater treatment.*
- *With respect to the existing Environment Act proposal, the proponent has not provided an assessment of the potential impact of the discharge on the Manning Channel or downstream waterways. While page 7 of the proposal indicates that the Seine River Diversion Water Quality Model was run, no interpretation of the output was provided. Given that no information was provided on inputs and updates to the model provided by Dillon Consulting, it is impossible to evaluate the use of the water quality model for this application.*

<u>Proponent Response – November 29, 2006</u>

- Tier I standards of the Manitoba Water Quality Standards, Objectives and Guidelines (MWQSOG) are generally applied to domestic wastewater treatment lagoons. Tier II water quality objectives are typically applied where fish may be affected by the discharge of effluent into the water where such fish are present. The relevant parameter of the effluent insofar as Tier II objectives are concerned is ammonia (NH3). If the lagoon effluent were to discharge directly into a watercourse with a fish presence, the ammonia in the effluent, should be lower than the Tier II guideline for

that particular pH and temperature value of the receiving water body or watercourse. In this case, the lagoon discharges into municipal ditches before reaching recognized watershed drains. Since the effluent from the Mitchell lagoon will travel through approximately 2.6 kilometres of municipal ditching prior to its entrance into the Chortitz drain, the ammonia in the effluent will either be diluted if in fact there is water flowing in the ditches at the time of discharge or, will volatilize significantly, thus reducing its concentration before entering areas of fish presence. Therefore no ammonia monitoring is recommended.

- It is our understanding that DFO is a member of the TAC.
- Well logs from Manitoba Water Well reports were included in Appendix B of the Geotechnical Report for 12-07-05 EPM (location of the new lagoon). Based on drainage maps, groundwater flow is towards the northwest. Since the lagoon expansion is situated in SW 12-07-05 EPM, well logs for SW/NW 12-07-05 and SE/NE 11-07-05 were reviewed. Three wells utilised for domestic and livestock purposes were documented in these areas (two in NW 12-07-05; one in SE 11-07-05). The available information states that these wells have perforations between 28.3 and 67.0 m in the limestone bedrock aquifer.
- Most residences in the Community of Mitchell have shared or individual wells. The typical in-house water treatment is achieved by water softeners.
- Consultation with the Office of Drinking Water concerning this project will occur at the appropriate time within the approval process.
- Quality assurance of the permeability of the dyke cores will be performed by Manitoba Conservation upon completion of the lagoon construction, prior to commissioning. Groundwater monitoring will be performed as required by Manitoba Conservation.
- The construction of the proposed lagoon will conform to the licence conditions imposed by Manitoba Conservation. Therefore the lagoon liner will meet and/or exceed the permeability regulations and groundwater should be sufficiently protected. Discharge of the treated lagoon effluent will be sufficiently contained in the receiving ditches and drains.
- The option of developing a regionalized facility was pursued in some detail; however, in the end an agreement could not be reached.
- As stated on page 7 of the EAP, the water quality program is not set up to present the water quality with lagoons discharging after the June 15th period, and the focus is on water quality during the May discharge period. Therefore, after consultation with Manitoba Water Stewardship, the best method of updating the program involved removing the Mitchell lagoon data. The discharge of the new Mitchell Lagoon will be delayed until after June 15th, and therefore the water quality will be improved during the critical fish-spawning period. The Seine River Diversion Water Quality Model Final Report states on page 45 that, "additional data requirements are minimal if the model is to be used as a planning tool and more significant if the model is going to be

used as a wasteload allocation model to support regulatory approvals." To our knowledge no additional information has been used to solidify the model's use in either application.

- Further, as this EAP process involves regulatory approval of a new lagoon, significant data requirements are in order prior to its use for these purposes.

January 30, 2007

- *Water Quality Management Section's concerns have not been addressed by the proponent. The proponent has not provided an assessment of the potential impact of the discharge on the Manning Channel or downstream waterways. I gather from the additional information provided that the Seine River Diversion Water Quality Model was not used to evaluate the impact of the proposed lagoon on water quality. Therefore, the proponent should include a traditional assessment of the proposed discharge on water quality.*

Proponent Response – February 22, 2007

- After further discussing the remaining concern with Nicole Armstrong of Water Quality Management – Manitoba Water Stewardship, the information resulting from the use of the Seine River Diversion Water Quality Model is incomplete because it does not address the water quality impact of the Mitchell lagoon design flows during the actual discharge periods. To that end, additional information will be provided on the impacts on water quality during the spring discharge period (say June 15 – July 15) and the fall discharge period (say October 1 – 31).
- Not specified in detail in the EAP, the effluent from the proposed Mitchell lagoon will flow approximately 2.4 kilometres in a municipal ditch before entering the Chortitz Drain (3rd order) where it will flow for approximately 3.8 kilometres before confluence with the Manning Canal. A discussion of the water quality impacts on the Manning Canal is complicated by the distance the effluent will travel before reaching the Canal. If the end of pipe was a direct discharge into a receiving stream, the impacts are direct and are more easily determined. However, to accurately quantify the impacts of the lagoon effluent in this discharge situation, a monitoring program at the facility, along the discharge route and at the receiving Manning Canal would be required. It should be noted that the lagoon flows are for the twenty-year design period, and testing now will only be indicative of the impacts of the current flows.
- It is known from other monitored lagoon discharges that several trends are typical when effluent flows in a ditch prior to entry into a flowing watercourse. The flow of the effluent along the ditch provides further nitrification and reduction in ammonia levels. The presence of emergent vegetation promotes the uptake of nutrients such as phosphorus. Dissolved oxygen levels should naturally increase as the effluent traverses the route. If the ditch is flowing prior to discharge, dilution will only further reduce the various parameters in the wastewater such that by the time the effluent reaches the Manning Canal, the levels are expected to be only slightly above background levels.

- Water quality data for the Manning Canal was provided by Water Quality Management Section 2007 – Manitoba Water Stewardship. The samples were collected in 2002 and 2005. Data for the Mitchell lagoon was available in Table 15 of the *Seine River Diversion Water Quality Model Final Report* (September 2001). The sample was collected in 2000. As mentioned in the EAP, the existing Mitchell lagoon is considerably undersized and the new lagoon is expected to provide enhanced treatment of the wastewater. Therefore, these parameters can likely be considered 'worst case'. Table 1 details the average of the Manning Canal water quality parameters and the Mitchell lagoon parameters. Only those parameters with comparable data are presented.

Table 1. Comparison of Manning Canal and Mitchell Lagoon Parameters

Parameter	Manning Canal	Mitchell Lagoon
Ammonia – dissolved [mg/L]	0.07	0.61
Conductivity [µS/cm]	401	2,250
Nitrogen – dissolved NO_2 & NO_3 [mg/L]	0.08	0.18
TKN [mg/L]	1.3	18.1
BOD [mg/L]	2	21
Phosphorus – total [mg/L]	0.369	1 .94
Phosphorus – total dissolved [mg/L]	0.228	0.565
pH	7.99	9.24
TSS [mg/L]	33	30

- Assessment of Environment Canada's archived hydrometric data for Station 050E005 provided flow data (1961 – 1977) for the Manning Canal during the two discharge periods. This particular station is located in the northeast corner of section 28-7-5 EPM on the Manning Canal, approximately 2.2 kilometres downstream of the confluence of the Chortitz Drain.
- The average flow during the spring discharge period was 0.50 m^3/s, with a low of 0 m^3/s and a peak of 16 m^3/s. The average flow during the fall discharge period was 0.06 m^3/s, with a low of 0 m^3/s and a peak of 1.2 m^3/s.
- The flow from the Mitchell lagoon will depend on whether the cells discharge individually or simultaneously; typically the cells discharge individually. Since the two secondary cells are essentially equal in size, with equally sized discharge pipes, the average flow of one discharging cell is equal to 0.27 m^3/s, or half of the flow of both cells discharging (0.54 m^3/s). The time for simultaneous discharge will be approximately 5.5 days. Therefore, if one cell was discharged followed without delay by the other cell, the discharge time would be approximately 11 days.
- The Manning Canal can readily accommodate the design flows from the Mitchell lagoon based on a recorded peak of 47.9 m^3/s at the specified station. During the spring discharge period, simultaneous discharge would approximately double the flow in the Canal and during the fall discharge, the discharge would effectively be the

only flow in the Manning Canal.

- Since there are two discharge periods and two discharge options (one or two cells), four discharge scenarios are possible. Table 2 details the combined water quality in the Manning Canal during these four discharge scenarios.

Table 2. Water Quality in the Manning Canal during Mitchell Lagoon Discharge Scenarios

Parameter	Spring Discharge — One Cell	Spring Discharge — Two Cells	Fall Discharge — One Cell	Fall Discharge — Two Cells
Ammonia — dissolved [mg/L]	0.26	0.35	0.51	0.56
Conductivity [0/cm]	1,049	1,361	1,914	2,065
Nitrogen — dissolved NO_2 & NO_3	0.12	0.13	0.16	0.17
TKN [mg/L]	7.2	10.0	15.0	16.4
BOD [mg/LI	9	12	18	19
Phosphorus — total [mg/L]	0.920	1.185	1.654	1.783
Phosphorus — total dissolved [mg/L]	0.346	0.403	0.504	0.531
pH	8.43	8.64	9.01	9.12
TSS [mg/L]	32	31	31	30

- The flow in the Manning Canal is low in the Spring discharge period and very minimal during the Fall discharge period. At times, the lagoon discharge may be the only flow in the Canal, depending on the precipitation experienced. These ratios presented in Table 2 may provided the framework to base the water quality on, but the many other factors involved in the actual water quality of the combined flow will only be revealed through testing. As a result, these levels are expected to be lower.
- Manitoba Conservation generally requires treated effluent to have a BOD, < 30 mg/L, faecal coliform MPN of <200 organisms/100 mL, and total coliform MPN <1500 organisms/100 mL. Again, experience with other wastewater facilities shows that these requirements are very realistic and the Mitchell facility is expected to produce an effluent quality well below these maximum values.

Disposition:

- Limits, terms and conditions of the draft Environment Act Licence provide operating criteria regarding organic load, odours, containment and quality of treated wastewater that are conventional for standard lagoons in Manitoba.
- The draft Environment Act Licence contains a Clause requiring the Licencee submit to the Director for approval, within six months of the date of this Licence, a groundwater investigation and monitoring plan for the site of the Development to monitor for liner integrity.

- The draft Environment Act Licence contains Clauses that require the Licencee to construct and operate the wastewater treatment lagoon in such a manner as to prevent the disruption of natural wildlife and fish habitats.

- Limits, terms and conditions of the draft Environment Act Licence provide construction requirements and operating criteria regarding monitoring and controlling effluent discharges that are conventional for wastewater treatment lagoons in Manitoba.

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. Fisheries and Oceans, Environment Canada and Health Canada would be able to provide specialist if requested.*

Fisheries and Oceans

- *It was concluded that the proposed works and undertakings are adequate to protect fish and fish habitat provided that the work is carried out as described in the plans in conjunction with the implementation of additional listed measures.*

Disposition:

- Where practical, the concerns identified by DFO have been addressed through limits, terms and conditions as well as through specific monitoring and reporting requirements of the draft Environment Act Licence.
- The draft Environment Act Licence contains Clauses that require the Licencee to construct and operate the wastewater treatment lagoon in such a manner as to prevent the disruption of natural wildlife and fish habitats.
- The draft Environment Act Licence contains a clause that requires that all fuel storage and equipment servicing areas established for the construction and operation of the Development are a minimum distance of 100 metres from any waterbody, and that compliance with the requirements of *Manitoba Regulation 188/2001* respecting *Storage and Handling of Petroleum Products and Allied Products Regulation* or any future amendment thereof is maintained.

Health Canada

October 12, 2006

- *The EAP does not indicate the proximity of wells and other potential potable water resources to the proposed lagoon site and effluent discharge route. Are existing potable water sources in these areas protected from contamination?*
- *The EAP indicates that the current lagoon is overloaded and may be leaking. Has groundwater monitoring been undertaken to determine whether local ground waters have been impacted?.*
- *The EAP does not indicate whether staff operating the new facility will be trained/certified as required.*
- *The information received did not provide detail on the truck dump area. Will safety devices be incorporated (e.g. bollards, high curb, lighting) to prevent trucks from reversing into the spillway during all weather conditions?*
- *To what level/standard will the facility be flood protected?*
- *Section 6.1 states that odours may be significant during spring thaw. The proposed facility is to be located north west of the community. The EAP does not indicate the prevailing wind direction and assess the potential impact to any receptors during this time frame or when most of the septage is dumped in the fall.*

Proponent Response – November 29, 2006

- Well logs from Manitoba Water Well reports were included in Appendix B of the Geotechnical Report for 12-07-05 EPM (location of the new lagoon). Based on drainage maps, groundwater flow is towards the northwest. Since the lagoon expansion is situated in SW 12-07-05 EPM, well logs for SW/NW 12-07-05 and SE/NE 11-07-05 were reviewed. Three wells utilised for domestic and livestock purposes were documented in these areas (two in NW 12-07-05; one in SE 11-07-05). The available information states that these wells have perforations between 28.3 and 67.0 m in the limestone bedrock aquifer and are sufficiently protected by the overlying clay and till soils. Concerning surface water, discharge of the treated lagoon effluent will be sufficiently contained in the receiving ditches and drains.
- No groundwater monitoring has been undertaken in the vicinity of the existing lagoon that we are aware of, nor are there any plans in place.
- According to the R.M. of Hanover, the operators of such lagoon facilities are licensed.
- The truck dump facility is designed with a high concrete curb along with flexible markers located at the sides of these curbs to assist in backing up the septage trucks to the proper position.
- The top of dykes for the proposed Mitchell lagoon are at minimum 2.0 metres above

the existing ground elevations for the area.

- Based on information from Environment Canada for the Winnipeg International Airport (closest station to Mitchell) for the 1971-2000 period of record, the wind is most frequently from the south during the month of April, which is generally when the spring thaw occurs. Since the Community of Mitchell is southeast of the lagoon and available imagery shows the nearest residence to the north of the lagoon is approximately 900 metres away, the potential impact to any receptors is expected to be minimal.

January 24, 2007

- *The EAP indicated that the existing lagoon is hydraulically and organically overloaded, and is "likely" leaking. Cochrane's response indicated that no groundwater monitoring is in place or planned in the vicinity of the existing lagoon. The proponent provided no assessment of groundwater use in the area of the existing lagoon.*
- *We recommend that a monitoring program be implemented to determine if any impact to local wells is/will occur prior to, during or after decommissioning. Appropriate mitigation would be required if the water did not meet provincial/federal microbiological and chemical requirements for drinking water.*

Proponent Response – February 22, 2007

- Well logs from Manitoba Water Well reports for 1-7-5 EPM (location of the existing lagoon) are included as an enclosure. Three wells utilized for domestic purposes were documented in this area, with the residences no closer than 400 metres from the nearest lagoon dyke wall. The available information recorded open holes starting between 34.1 –35.3 metres in the limestone bedrock aquifer. All soil profiles indicate that a clay layer between 16.2 and 29.5 metres in thickness protects the aquifer in this area. Due to the depth of the surrounding wells, the presence and thickness of the clay layer, and the **positive pressure** of the aquifer, we do not believe that monitoring is required. However, groundwater monitoring will be implemented if required by Manitoba Conservation.

Disposition:

- The draft Environment Act Licence contains Clauses that require the existing wastewater treatment lagoon to be decommissioned. Requirements for decommissioning include; discharging treated wastewater within the terms of the licence, removing and disposing of accumulated sludge from all cells, leveling the site to original grade, and restricting the use of the site to growing of certain types of crops for a period of at least three years.
- The draft Environment Act Licence contains a Clause requiring the Licencee submit to the Director for approval, within six months of the date of this Licence, a groundwater investigation and monitoring plan for the site of the Development to monitor for liner integrity.

- Limits, terms and conditions of the draft Environment Act Licence provide operating criteria regarding organic load, odours, containment and quality of treated wastewater that are conventional for standard lagoons in Manitoba.
- *Manitoba Regulation 77/2003* respecting *Water and Wastewater Facility Operators* requires that operators of wastewater treatment lagoons must be certified.

PUBLIC HEARING:

A public hearing was not requested.

RECOMMENDATION:

Issue an Environment Act Licence in accordance with the attached draft. Enforcement of the components of the new Licence that relate to soil liner characteristics should be assigned to the Environmental Assessment & Licensing Branch until all soil testing has been completed.

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