

## **SUMMARY OF COMMENTS/RECOMMENDATIONS**

**PROPONENT:** Rural Municipality of Brokenhead  
**PROPOSAL NAME:** RM of Brokenhead Wastewater Treatment Lagoon  
Expansion  
**CLASS OF DEVELOPMENT:** 2  
**TYPE OF DEVELOPMENT:** Wastewater Treatment Lagoon  
**CLIENT FILE NO.:** 4766.10

### **OVERVIEW:**

On May 29, 2013, the Department received an Environment Act Proposal (EAP) on behalf of the Rural Municipality of Brokenhead for the alteration, expansion and operation of the wastewater treatment lagoon located in NW and SW 15-13-06 EPM in the Rural Municipality of Brokenhead. The wastewater treatment lagoon services the communities of Garson, Tyndall and Henryville as well as rural residents of the municipality. Treated wastewater from the wastewater treatment lagoon may be discharged to Devil's Creek between June 15<sup>th</sup> and November 1<sup>st</sup> of any year.

The Department, on July 11, 2013, placed copies of the EAP report in the Public Registries located at the Legislative Library, 200 Vaughn St., Winnipeg; the Millennium Public Library, 4<sup>th</sup> Floor, 251 Donald St., Winnipeg; Manitoba Eco-Network, 3<sup>rd</sup> Floor, 303 Portage Ave., Winnipeg; the Brokenhead Regional Library, 427 Park Ave., Beausejour; and the Online Registry, <http://www.gov.mb.ca/conservation/eal/registries/index.html>, and provided copies of the EAP report to the TAC members. As well, the Department placed public notifications of the EAP in the Selkirk Journal on Thursday, July 11, 2013 and in the Beausejour Clipper on Monday, July 15, 2013. The newspaper and TAC notifications invited responses until August 12, 2013.

On September 9, 2013, Manitoba Conservation and Water Stewardship forwarded four TAC correspondence items to the proponent's consultant for response. There were no comments or requests for additional information presented by the public.

On September 16, 2013, Manitoba Conservation and Water Stewardship submitted the September 9, 2013 letter and all ten of the responses from the TAC members to the appropriate Public Registries.

In letters dated September 17, 2013, the proponent's consultant provided responses to the TAC correspondences. The letters were forwarded to the participating TAC members on September 24, 2013. There were no additional requests for information.

### **COMMENTS FROM THE PUBLIC:**

There were no comments from the public.

**COMMENTS FROM THE TECHNICAL ADVISORY COMMITTEE:**

**Environmental Services Section – Infrastructure and Transportation**

- *No concerns.*

**Office of Drinking Water – Conservation and Water Stewardship**

- *No concerns.*

**Office of the Fire Commissioner – Family Services and Labour**

- *No comments.*

**Parks and Natural Areas Branch – Conservation and Water Stewardship**

- *No concerns.*

**Water Use Licensing Section – Conservation and Water Stewardship**

- *No concerns.*

**Watersheds and Protected Areas Branch and Lands Branch – Conservation and Water Stewardship**

- *No concerns.*

**Environmental Compliance and Enforcement – Conservation and Water Stewardship**

- *Section 2.5.3 of the proposal states that “the drainage route from the expanded lagoon will follow the existing licensed drainage route from the RM of Brokenhead lagoon”. In addition, the proposal indicates that the phosphorus concentration at point of discharge is greater than 1.0 mg/L and discusses several nutrient reduction strategies.*
- *ECE recommends that consideration also be given to lengthening the discharge route from the lagoon facility to Devil’s Creek to further mitigate potential impacts to surface water.*

**Proponent Responses – September 17, 2013:**

- As described in Section 2.5.3.1 of the Environment Act Proposal document, the Manitoba Conservation and Water Stewardship – Fisheries Branch indicated in a January 9, 2013 correspondence that they would prefer the discharge outlet to be located on the far east side of the lagoon to maximize the length of the discharge channel before entering the Devil’s Creek.

As shown on Plan L2, the discharge pipe was located on the east side of the proposed storage cell to maximize the length of the discharge ditch prior to entering the Devil’s Creek. Increasing the length of the ditch beyond the perimeter of the cells is not feasible as there is no additional land available at the proposed lagoon site.

As per the Fisheries Branch request the discharge ditch will meander as much as possible within the available area with some widened sections for pools to provide an extra buffer to achieve water quality limits prior to entering a fish bearing creek and create fish habitat.

### **Fisheries Branch – Conservation and Water Stewardship**

- *We note that in the proposal the CEC had recommended that the lagoon licence be issued providing a 30 m buffer zone was maintained. Recently revised Provincial Land use Policies now state a minimum of 15 m along 1<sup>st</sup> and 2<sup>nd</sup> order surface waters and 30 meters on 3<sup>rd</sup> order and higher as well as lakes. From Google Earth maps it appears there is ~50 m between the outer edge of the lagoon to the edge of the creek. Yet the proponent's indicate maintaining the minimum of 3 m based on the requirements of a nutrient buffer zone. Is the above recommendation of 3 m correct?*
- *While it would appear that there will be sufficient storage based on the 20 year design and particularly if converted to an aerated lagoon, we do not follow the logic of using 30% for the reject water in determining the required hydraulic capacity. While the actual values for reject water to date have ranged from 25.1% to 29.9% between 2008 and 2011, if the requirement for water is going to increase due to increased population, would the amount of reject water being directed to the lagoon not also increase?*
- *Plan 1 shows where the proposed discharge valve location is but it is unclear how the effluent will be routed through to Devil's Creek. Will the effluent be directed to the existing discharge outlet or will there be a new discharge outlet constructed? Further to the proposed outlet Fisheries Branch had recommended that the proponent consider creating a longer meandering outlet channel to provide for additional improvements to water quality, particularly in the event of the requirement for an emergency discharge. While our recommendation is noted in the proposal there was no further consideration of the recommendation. A longer discharge route, if constructed appropriately, could have also provided another alternative to reducing phosphorous limits by allowing trickle discharge to occur. Why was the option of a longer effluent discharge route not considered and discussed in the proposal and can it be done now?*
- *Depending on the year, as noted in the proposal, Devil's Creek supports a number of life stages, if not all life stages, for small and large bodied fish species. While impacts to fish may be minimized by ensuring the effluent meets or exceeds Water Quality Standards, Objectives and Guidelines for Aquatic Life and releasing after June 15<sup>th</sup>, these mitigation measures address spring spawning fish species. Not all fish present in Devil's creek are spring spawning fish. Monitoring to ensure ammonia is within recommended levels and that any chemicals used to bind the phosphorous are removed from the effluent prior to entering Devil's Creek would be important.*
- *In terms of potential licensing conditions that would address some of our fisheries concerns we would certainly be supportive of a licensing clause requiring monitoring upstream and downstream of the effluent discharge location for a specified period of time that includes the parameters noted above. For any construction activities we would*

*request the standard licensing clause that addresses the implementation of erosion control measures and clean rock be included in the licence. And finally could the following clause to address the potential to introduce aquatic and terrestrial invasive species be included:*

- The Licencee shall, during construction and maintenance of the Development, prevent the introduction of foreign biota to surface waters and in native habitats by ensuring all equipment used in or adjacent to water, including transport equipment, is clean before use at each location.*
- We would of course appreciate further discussion regarding the construction of a longer effluent discharge channel.*

Proponent Responses – September 17, 2013:

- The Environment Act Proposal document Section 2.4.1 discusses the minimum setback distance to the Devil’s Creek of 3 m based on the requirements of a nutrient buffer zone outlined in the Nutrient Management Regulation 62/2008. The existing setback distance to the Devil’s Creek of approximately 50 m will be maintained, which far exceeds the setback distance required by the Nutrient Management Regulation.
- The amount of reject water generated by the WTP is proportional to the amount of water required by the community. The percentage of reject water is based on the properties of the membrane filtration unit in the WIP and does not change based on the quantity of water treated. The percentage of reject water used for design is 30% of the raw water intake to the WTP or approximately 96 L/person/day. In design year 1 (2013) the average daily volume of reject water sent to the lagoon will be 158.3 m<sup>3</sup>/day (1,649 equivalent population x 96 L/person/day) and in design year 20 (2032) the average daily volume of reject water sent to the lagoon will be 365.1 m<sup>3</sup>/day (3,803 equivalent population x 96 L/person/day).
- Effluent discharged from the proposed new storage cell will flow north and west through a newly constructed discharge ditch and connect to the existing discharge ditch at the northwest com of the new storage cell labeled “meet existing ditch” on Plan L2. The treated effluent will then flow through the existing ditch and the existing discharge outlet into the Devil’s Creek.

Based on the recommendation by the Fisheries Branch the newly constructed discharge ditch will include meanders and some widened sections for pools within the available land area to provide an extra buffer to achieve water quality limits prior to entering a fish bearing creek and create fish habitat.

Increasing the length of the ditch beyond the perimeter of the cells is not feasible as additional land is not available at the proposed lagoon expansion site.

Trickle discharge as an alternative to a 1.0 mg/L phosphorus limit would only be permitted for small wastewater treatment facilities which serve less than 2,000 equivalent people. The RM

of Brokenhead lagoon is sized to treat well over 2,000 residents and therefore a trickle discharge would not be accepted as a nutrient reduction methodology.

- According to the Manitoba Water Quality Standards, Objectives, and Guidelines, November 28, 2011, total ammonia limits only apply to continuously discharging wastewater treatment facilities. The proposed lagoon expansion will be intermittently discharged and therefore ammonia limits will not apply.

Chemicals such as alum are proposed to be added to the lagoon to reduce phosphorus. The alum produces a chemical reaction with the phosphorus causing a pin floc. The pin floc of phosphorus and the turbidity settle to the bottom as sludge. Removal of chemicals used to bind phosphorus from the effluent would not be required as the pin flocs would settle to the bottom of the lagoon as sludge.

- Upstream and downstream monitoring could be completed if required by the Environment Licence. Erosion control measures will be implemented as described in Section 4.2.1 of the EAP.

#### Disposition:

- The draft Environment Act Licence contains clauses that requires that discharges of effluent from the wastewater treatment lagoon not occur, amongst other limits and terms, where:
  - a) the total phosphorus is in excess of 1.0 milligram per litre;
  - b) where the concentration of unionized ammonia is in excess of 1.25 mg/L, expressed as nitrogen (N), at  $15^{\circ}\text{C} \pm 1^{\circ}\text{C}$ ; and
  - c) where, if effluent is chlorinated, the total residual chlorine content of the effluent is in excess of 0.02 milligrams per litre.
- The draft Environment Act Licence contains a clause that requires that all materials and equipment be operated, maintained, and stored in a manner that prevents any deleterious substances from entering the wastewater treatment lagoon, the discharge route and associated waterways.
- The draft Environment Act Licence contains a clause that requires that rock that is free of silt and clay be used for riprap.
- The draft Environment Act Licence contains a clause that requires that the proponent actively participate in any future watershed-based management study, plan/or nutrient reduction program, approved by the Director, for Devils Creek, the Red River and Lake Winnipeg and/or associated waterways and watersheds.
- The draft Environment Act Licence contains a clause that requires that the wastewater treatment lagoon be discharged over at least a two-week period, while accelerating discharge as necessary to maintain normal operation of the wastewater treatment, such that increased nutrient uptake from the wastewater effluent may occur along the discharge route.

### **Community and Regional Planning Branch – Local Government**

- *The applicant proposes to expand the existing wastewater treatment lagoon located on parcel “A”, Plan No. 43287 WLTO, which is located on W ½ 15-13-06 EPM in the Rural Municipality of Brokenhead. The site of the lagoon expansion is directly east of the existing lagoon, on land which is currently being used for agricultural purposes.*
- *The property in question is primarily zoned “A80” Rural and Agricultural Zone under the Rural Municipality of Brokenhead Zoning By-law. A small area at the southerly limit of the site is zoned “AL” Limited Agricultural Zone. As the lagoon expansion will include land under both zoning designations, the more stringent of the two zoning requirements apply whenever should the two zones differ in their regulations.*
- *Section 3.3.8 of the Zoning By-law states that nothing in the by-law shall be so interpreted as to interfere with the construction, maintenance, and operation of the facilities of any public utility, provided that the requirement of such public utility is of a standard compatible with the adjacent area as determined by the Development Officer, and that any building or structure erected in any zone complies with the yard and area requirements applicable to the zone.*
- *While public utilities are not provided for as a permitted or conditional use in either the “A80” or “AL” zone, Section 3.3.8 clearly exempts the proposed lagoon expansion from such considerations. The setback requirement for any structures from property lines is 25 feet. As the lagoon structure straddles the western property line, the two properties may be considered a single zoning site, eliminating any requirement for setbacks from the western property line.*
- *I advise that the Development Officer for the Brokenhead River Planning District should be contacted to determine if the proposed development is of a standard compatible with the adjacent area.*

### **Proponent Responses – September 17, 2013:**

- The proposed wastewater treatment lagoon expansion is not expected to cause any compatibility issues with the adjacent area. The adjacent area to the development is the existing RM of Brokenhead wastewater treatment lagoon and agricultural fields.

### **Water Science and Management Branch – Conservation and Water Stewardship**

- *Chemically precipitated phosphorus leads to increased reliance on chemicals and on a greatly reduced ability to recycle the valuable nutrients contained in biosolids and sludge. Water Quality Management Section encourages the use of effluent irrigation for fertilizer value and to mitigate the impacts of nutrient loading to receiving water ways. Can the proponent please assess the use of effluent irrigation as a demonstrated nutrient reduction strategy to meet a < 1 mg/L phosphorus limit?*

- *Can the proponent please assess the feasibility of a horizontal subsurface flow wetland for the RM of Brokenhead to meet a < 1 mg/L phosphorus limit?*
- *The Water Quality Management Section also agrees with Fisheries Branch preference for the discharge channel to meander with some widened sections for pools to provide an extra buffer to achieve increased water quality prior to entering the receiving water ways.*
- *The Water Quality Management Section is concerned with any discharges that have the potential to impact the aquatic environment and/or restrict present and future uses of the water. Therefore it is recommended that the license require the proponent to actively participate in any future watershed based management study, plan/or nutrient reduction program, approved by the Director.*

Proponent Responses – September 17, 2013:

- Effluent irrigation as a method for lagoon discharge has had very limited success in Manitoba in the past. Several communities in Manitoba have abandoned effluent irrigation systems including the Town of Roblin, the Community of Minto and the RM of Lac du Bonnet.

An effluent irrigation system would require, pumps, piping and irrigation equipment adding a significant cost to the project and creating logistical difficulties. Problems would occur with the system during wet years when agricultural fields do not require irrigation. Also, depending on the salinity of the wastewater, there is a risk of salinization of the soil which negatively affects plant growth.

An effluent irrigation system is not recommended based on the logistical difficulties, problems during wet years, risk to the soil, and poor experiences on other such projects in Manitoba.

- The feasibility of a surface flow constructed wetlands for nutrient reduction was discussed in the EAP report in Section 2.5.12.2. The report indicated wetlands require large land areas for construction, have increased odour potential, can favour mosquito breeding (due to vegetation type, very shallow effluent, and minimal wind action), can cause higher E. coli concentrations due to increase wildlife including mammals, waterfowl, reptiles and amphibians, and can add significant cost to the project. In addition, the use of constructed/engineered wetlands requires further investigation regarding their effectiveness under climatic conditions in Manitoba. Constructed wetlands were investigated during design of the existing RM of Brokenhead lagoon and were deemed not feasible.
- A horizontal subsurface flow wetland would not have as significant odour potential, mosquito breeding grounds and potential for increased E. coli due to the subsurface discharge and would also be better suited for cold weather climates. However, a horizontal flow subsurface wetland would still require a large land area and would add significant cost to the project due to the piping and granular material requirements.  
Based on the high capital costs and large land area required, a horizontal flow subsurface wetland is not recommended.

- As per the Fisheries Branch request the discharge ditch will meander as much as possible within the available area with some widened sections for pools to provide an extra buffer to achieve water quality limits prior to entering a fish bearing creek and create fish habitat.
- The proponent would be willing to participate in any future watershed-based management study, plan/or nutrient reduction program, approved by the Director.

Disposition:

- The draft Environment Act Licence contains clauses that requires that discharges of effluent from the wastewater treatment lagoon not occur, amongst other limits and terms, where:
  - a) the total phosphorus is in excess of 1.0 milligram per litre;
  - b) where the concentration of unionized ammonia is in excess of 1.25 mg/L, expressed as nitrogen (N), at 15°C ±1°C; and
  - c) where, if effluent is chlorinated, the total residual chlorine content of the effluent is in excess of 0.02 milligrams per litre.
- The draft Environment Act Licence contains a clause that requires that the proponent actively participate in any future watershed-based management study, plan/or nutrient reduction program, approved by the Director, for Devils Creek, the Red River and Lake Winnipeg and/or associated waterways and watersheds.
- The draft Environment Act Licence contains a clause that requires that the wastewater treatment lagoon be discharged over at least a two-week period, while accelerating discharge as necessary to maintain normal operation of the wastewater treatment, such that increased nutrient uptake from the wastewater effluent may occur along the discharge route.

**PUBLIC HEARING:**

A public hearing has not been requested.

**RECOMMENDATION:**

Issue an Environment Act Licence in accordance with the attached draft. Enforcement of the Licence should be assigned to the Environmental Approvals Branch until testing of the soil liner has been completed.

**PREPARED BY:**

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March 4, 2014

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