

SUMMARY OF COMMENTS/RECOMMENDATIONS

PROPOSAL NAME: Rural Municipality of Whitewater
Elgin Wastewater Treatment Lagoon Upgrade
CLASS OF DEVELOPMENT: 2
TYPE OF DEVELOPMENT: Wastewater Treatment Lagoon – Waste/Scrap
CLIENT FILE NO.: 159.10

OVERVIEW:

On August 28, 2007, the Department received a Proposal from J.R. Cousin Consultants Ltd. on behalf of the Rural Municipality of Whitewater for alterations to the existing Community of Elgin wastewater treatment lagoon located in SE 5-6-21 WPM in the Rural Municipality of Whitewater. The proposed alterations consist of: interchanging the functions of the two cells of the wastewater treatment lagoon; removing vegetation from the dykes; installing synthetic liners in the two cells; constructing an access road, truck turnaround and spillway; and reestablishing the current discharge route. Additional information was received from the proponent on January 22, 2008. Treated wastewater from the wastewater treatment lagoon will be discharged between June 15th and November 1st of any year to Elgin Creek that flows into the Souris River.

The Department, on September 22, 2007 placed copies of the Proposal in the Public Registries located at 123 Main St. (Union Station), the Winnipeg Public Library, the Manitoba Eco-Network, and the Rural Municipality of Whitewater office. Copies of the Proposal were also provided to the Technical Advisory Committee (TAC) members. The Department placed public notification of the Proposal in the Souris Plaindealer on Saturday, September 22, 2007. The newspaper and TAC notifications invited responses until October 24, 2007.

COMMENTS FROM THE PUBLIC:

No responses were received from the public notification.

COMMENTS FROM THE TECHNICAL ADVISORY COMMITTEE:

Manitoba infrastructure and Transportation

- *No concerns*

Culture, Heritage and Tourism - Historic Resources

- *No concerns*

Water Stewardship

November 1, 2007

- *The site is underlain by permeable materials followed by a shale aquifer. The installation of a geo-membrane is a very positive development and it is noted that the*

consultant has indicated that a monitoring well network would be installed. In order for a scientifically credible and efficient monitoring well network to be installed the proponent should make use of the existing plume of waste water to determine groundwater flow direction and optimum location for monitoring wells. Test drilling and sampling or perhaps a trailer mounted EM survey would likely identify the plume that has developed for over the past years. Once mapping of the existing plume has been carried out, optimum locations for installation of monitoring wells could then be determined. This would be a much better process for observation well installation than the traditional method of putting wells at the mid-point of each side of the lagoon, no matter what the groundwater flow direction may be. It would also allow for some assessment of the existing contaminant plume and allow monitoring of the plume as it attenuates.

- *The proposed installation of a geothermal liner into the existing lagoon facility will reduce the risk of further groundwater contamination, but the proposal falls short in providing alternatives to mitigate nutrient impacts to downstream surface waters. The lagoon discharges to Elgin Creek, which leads to the Souris River, the Assiniboine River, and ultimately to Lake Winnipeg. These downstream surface waters provide drinking water, as well, they support irrigation, recreational activities, and aquatic life resources.*
- *Manitoba Water Stewardship (Jones and Armstrong, 2001) reported that nitrogen levels in Souris River, at Souris (Station WQ0371) increased 25.9 percent between 1978 to 1997. This study also found high total phosphorus concentrations recorded in the latter half of the reporting period, however there was no significant trend in the phosphorus data. However, water quality station WQ0350 located on the Souris River at PR #530, near the community of Treesbank, showed that flow-adjusted concentrations of both total nitrogen and total phosphorus increased significantly at 45% for nitrogen, and over 50% for phosphorus.*
- *The Turtle Mountain Conservation District, and other local groups and individual landowners are undertaking efforts to reduce nutrient loading to surface waters with the watershed. This proposal does not propose any alternatives which would help mitigate nutrient impacts to downstream waterways, and support the efforts of those working improve the quality of surface waters in this watershed. The Lake Winnipeg Stewardship Board has recommended that all small wastewater treatment facilities, including municipal lagoons, should meet a phosphorus limit equivalent to 1.0 mg/L. The proposed phosphorus limit of 1.0 mg/L is consistent with efforts underway across Manitoba and in upstream jurisdictions to reduce nutrient loads to Lake Winnipeg and its watershed. It is desirable to recycle these nutrients on land, rather than releasing them to waterways. In the Lake Winnipeg Stewardship Board's December 2006 report to the Minister of Water Stewardship, the Board provides several strategies on how nutrient reduction could be achieved for small wastewater treatment facilities (see recommendations 14-20). The proponent has not detailed any alternative disposal options, such as effluent irrigation or trickle discharge.*
- *Clearly, more needs be done to recycle valuable nutrients on land, rather than discharging them directly into waterways where they impair the health of all waterways from Elgin Creek to Lake Winnipeg.*

- *The proponent states that sludge from the existing facility will be discarded in a landfill. The proponent should investigate the option of applying this sludge to agricultural land at appropriate agronomic rates.*
- *The proponent should also ensure the siting of the facility complies with the proposed Nutrient Management Regulation under The Water Protection Act.*
- *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, for all downstream waterways.*
- *The outlet is not a provincial drain but rather is a natural watercourse. Any drainage concerns should be addressed through Environment Act licensing as opposed to a separate drainage licensing process. A concern with the drainage from the lagoon is that the November outflow will freeze in the infrastructure along the outlet and reduce the capacity of the outlet during initial spring flows. If any culverts have high spots downstream that would cause the culverts to back-flood and freeze full, that may be a problem.*
- *Fisheries Branch would like to note that while they may have no concerns with what is being proposed, Fisheries Branch comments do not take precedent over any recommendations by the Department of Fisheries and Oceans as they are responsible for fish habitat under the Federal Fisheries Act.*

Proponent Response (January 18, 2008):

- The proposed locations of the monitoring wells are as shown on Plan L2: Overall lagoon layout and key plan in the EAP. This is different from the traditional method of placing wells at mid-point of each side of the lagoon. As stated in Section 3.4 of the EAP this would provide a means of assessing if the geomembrane liner would be leaking. In addition to installing the monitoring wells a monitoring program would be developed to be implemented upon approval by Manitoba Conservation. This will enable assessing future impact to the groundwater from the lagoon effluent, if any.
- The lagoon will be upgraded to treat the wastewater to meet Manitoba Conservation requirements. Accordingly, the discharge criteria outlined in section 4.3 are based on the Manitoba Water Quality Standards, Objectives and Guidelines (November 2002) for municipal wastewater effluents. The treated effluent will be sampled and analysed prior to discharge. The effluent will be discharged only if it meets the license requirements for discharge. Furthermore the discharged effluent travels approximately 30 km through the 3rd order Provincial Drain and Elgin Creek before it reaches Souris River whereby some additional polishing could occur.
- The strategies on how to reduce nutrient from small wastewater treatment facilities as recommended in the Lake Winnipeg Stewardship Board - Report to the Minister of Water Stewardship, December 2006 were reviewed with particular emphasis to effluent irrigation and trickle discharge. The effluent irrigation option is not advisable for a small lagoon such as the Elgin lagoon in the R.M. of Whitewater. This option is not feasible due to the initial required high capital cost,

high operation cost, lack of trained man power, and insufficient amount of effluent to reliably meet crop water requirements from such a small lagoon.

- The trickle discharge (slower discharge) option is related to appropriate lagoon design, operation, and storage capacity. The design of the Elgin lagoon in the R.M. of Whitewater is in accordance with Manitoba Conservation Design Objectives for Standard Sewage Lagoon. The design meets the Manitoba Conservation requirements of a 230 day storage period providing sufficient organic and hydraulic capacity based on projected year 20 population contributing wastewater to the lagoon. The effluent will be discharged from the lagoon between June 15 and November 1. The discharged effluent from the lagoon would flow in the 3rd order Provincial Drain and Elgin Creek for approximately 30 km before draining into Souris River and eventually reaching Lake Winnipeg. This may provide opportunity for nutrients to be absorbed by plants growing in the drainage system. The treated effluent will be discharged only upon meeting Manitoba Conservation discharge criteria, which are outlined in section 4.3 of the EAP.
- Sludge disposal options were identified and included in the "R.M. of Whitewater Community of Elgin Infrastructure Assessment Study, November 2006" report by J. R. Cousin Consultants Ltd. The report acknowledges that Manitoba Conservation's current preferred method of sludge disposal is to apply the sludge as a soil amendment to agricultural land. However, of the options considered, drying and disposing the sludge in an approved waste disposal, which is also acceptable by Manitoba Conservation, was the recommended method for the Elgin lagoon.
- The siting of the lagoon was reviewed in regards to compliance with the proposed Nutrient Management Regulations under the Water Protection Act. According to the regulation, the minimum setback distance between a lagoon and near by drain is satisfied as long as the lagoon is not constructed in the nutrient buffer zone, i.e. land within the drains. The 3rd order Provincial Drain is the closest drainage structure to the lagoon. The distance between the Elgin lagoon in the R.M. of Whitewater and the 3rd order Provincial Drain is approximately 45 m. Thus the proponent meets the minimum setback distance (30 m) between the lagoon and the 3rd order Provincial Drain.
- The proponent would be willing to participate in any future watershed based management study, plan/or nutrient reduction program, approved by the Director, for the Souris River, the Assiniboine River and associated waterways.
- The period between June 15 and November 1 has been established by current guidelines of Manitoba Conservation for discharging lagoons. The proposed lagoon discharge period for the Elgin lagoon is in agreement with Manitoba Conservations recommendation hence discharging the lagoon during the specified period is not expected to cause a concern.
- The comments from the Fisheries Branch were not included in the EAP in a sense that they take precedent over recommendations by the Department of Fisheries and Oceans, if any. Rather they were included exactly as forwarded by the Fisheries Branch. If the Department of Fisheries and Oceans has any concerns related to the EAP please have them forward their concerns and would be addressed as necessary.

February 25, 2008

- This correspondence replaces the information provided by the Department of Water Stewardship on February 14, 2008.
- Manitoba Water Stewardship has reviewed the proponent's consultant's letter—dated on January 18, 2008—for the referenced file, forwarded for comment on January 25, 2008. The Department has the following concerns:
- The proponent has not provided reasonable justification for their nutrient management plan. The Department recommends that an *Environment Act* licence include one of the following nutrient mitigation options:
 - Trickle discharge with drainage ditch harvesting/management or
 - Effluent irrigation would be reasonable nutrient mitigation measures.
- The proponent has not provided adequate justification for discarding the sludge in a landfill. Applying these nutrients to agricultural land at appropriate agronomic rates is the most appropriate means on managing nutrients in the lagoon sludge. The Department recommends that the proponent should investigate the option of applying sludge to agricultural land at appropriate agronomic rates.

Disposition:

The draft Licence requires the Licencee to actively participate in any future watershed based management study, plan and/or nutrient reduction program, approved by the Director, for the Souris River, the Assiniboine River and/or associated waterways and watersheds.

Intergovernmental Affairs

- *section 2.4 Land Use Designation/Zoning in the Proposal states that the lagoon site is zoned Agricultural (AG80) which is incorrect -- while the RM of Whitewater has joined the 23 West Planning District which has hired a Land Use Planning consultant, the new Development Plan and Zoning By-laws are still in progress -- there is currently no municipal zoning which applies to the site.*
- *the lagoon site is located closer than 460 meters (1509 feet) from the Local Urban District of Elgin boundaries and is surrounded by non-residential land uses including a gravel pit, cemetery, and agricultural land.*
- *the closest dwelling in Elgin is more than 300 meters (984 feet) from the lagoon.*
- *the lagoon site is adjacent to a tributary of Elgin Creek into which the lagoon discharges treated effluent.*
- *the lagoon sits on land owned by the RM as shown on Plan 475 with the lagoon on Parcel A and the access road on Parcels B&C.*
- *Parcel A (about seven (7) acres in size) is not large enough to contain proposed improvements to the dikes around the lagoon and the consulting engineer has suggested that the RM purchase what they call a "buffer zone" of a little more than 100 feet around the lagoon to accommodate the required 30 meter (98 feet) setback from property lines.*
- *this "buffer zone" would require that the RM purchase from the neighbouring land owner about three (3) acres of land to be consolidated with Parcel A.*
- *acquiring this "buffer zone" will require the RM to make an offer to purchase and an application for subdivision.*

- *upgrading the existing lagoon site to better handle piped sewage from the L.U.D. of Elgin and to accept septage trucked in from rural residences is a reasonable municipal choice for an agricultural area with an aging and declining population.*
- *we have not identified any land use concerns with this proposal.*

Proponent Response (January 18, 2008):

- In response to item number #1 regarding the Land Use Designation/Zoning of the lagoon site our office has contacted the R.M. of Whitewater. Further discussion with the R. M. has confirmed that currently the land is not zoned as the Zoning By-Laws are yet in progress.
- No response is required for comments in items 2 - 9 as the comments are in agreement with what is proposed in the EAP.
- It was indicated that no concerns were identified by the Manitoba Intergovernmental Affairs regarding the proposal thus no further responses are provided.

Disposition:

After receiving the additional information from the proponent, no further comments were received from Intergovernmental Affairs. This was assumed to indicate that the original comments were satisfied.

Environmental Protection Operations Division

- *There are implications in flipping the order of primary and secondary cells in a lagoon. Normally a primary cell is designed to be shallower for "treatment" therefore a secondary cell depth may not be appropriate to use as a primary cell. Since the existing lagoon has been leaking, sizing should be confirmed to ensure that once the lagoon is lined that there is adequate room for the influent liquid.*
- *The report stated (Section 3.12, page 8; Water), that "...As wastewater is currently seeping out of the existing lagoon, the new geomembrane liner would be significant improvement to the existing wastewater treatment...". In addition,(section 3.4, page 9), "... as the existing lagoon does not hold liquid and untreated effluent has been seeping out of the lagoon and into the surrounding soils for many years.. "With the statements referred to above, it is obvious that a problem exists with the lagoon and or the site of the lagoon.*
- *EC recommends that the proponent conduct a detail geotechnical study on the location to determine its adequacy to host a wastewater lagoon. Implementation changes to a that may not be stable enough or geotechnically undesirable for a lagoon may not be the best option.*
- *Environment Canada does not promote the use of exfiltration cell unless it is located in a third cell(i.e used as a discharge option not a treatment option)*
- *EC also recommends that rigorous monitoring program be implemented. Installation of monitoring wells around the lagoon will serve as an early detection warning for possible groundwater contamination.*

Proponent Response (January 18, 2008):

- The lagoon upgrade has been designed so that adequate room for the influent liquid would be available in the new primary cell. Per current Manitoba Conservation

guidelines the primary cell can be designed to operate at the same liquid depth as the secondary cell, which is typically 1.5 m from the cell floor. Calculation of the Elgin lagoon sizing was based on 1.5 m liquid depth of operation in both the primary and secondary cells. It is confirmed that the lagoon would have sufficient capacity for the influent liquid if constructed as per plans showing the proposed details of construction.

- As stated in Section 2.6.4.2 of the EAP a geotechnical study on the lagoon site was conducted on October 24, 2005. A complete description and findings of the geotechnical study can be found in the "Community of Elgin Infrastructure Assessment Study Geotechnical Investigation for Elgin Wastewater Treatment Lagoon, November 2005" as reported by J. R. Cousin Consultants Ltd. The results of the geotechnical investigation indicated that clay soils suitable for a lagoon liner do not exist at the site. Consequently it was recommended that a clay borrow pit be located for reconstruction of the lagoon with a clay liner or alternatively a synthetic liner be used in the lagoon reconstruction. Hence the suitability of the site for reconstruction of the lagoon and the liner to be used in the reconstruction was determined based on the abovementioned geotechnical investigation.
- Plan L2: Overall lagoon layout and key plan in the EAP shows proposed locations for installation of monitoring wells. As stated in Section 3.4 of the EAP this would provide a means of assessing if the geomembrane liner would be leaking. In addition to installing the monitoring wells a monitoring program would be developed to be implemented upon approval by Manitoba Conservation. This will facilitate assessing future impact to the groundwater from the lagoon effluent, if any.

Disposition:

After receiving the additional information from the proponent, no further comments were received from Environmental Protection Operations Division. This was assumed to indicate that the original comments were satisfied.

Conservation - Sustainable Resource & Policy Management

- *This is a case of existing noncompliance with respect to the setback distance from the community, and as such Environmental Services has no objection to maintaining the existing setback for the upgrade lagoon.*
- *The municipality should be aware that the reduced setback distance may increase the likelihood of future odour complaints and also may limit the community's ability to expand in the direction of the lagoon.*

Proponent Response (January 18, 2008):

- As stated in Section 2.6.2 of the EAP the Municipality is aware of limitations of the lagoon siting and has accepted full responsibility for any consequences that may result.

Disposition:

After receiving the additional information from the proponent, no further comments were received from Environmental Protection Operations Division. This was assumed to indicate that the original comments were satisfied.

Health

- *The need for fencing, gates and warning signs has been identified in the proposal so as 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.*
- *Consideration of leachate monitoring.*

Disposition:

- The requirement for fencing has been included in the draft Licence.
- Operating the lagoon in a manner that minimizes offensive odours is required in the draft Licence.
- Effluent limits are consistent with the Manitoba Water Quality Standards, Objectives, and Guidelines.
- Groundwater monitoring is required in the draft Licence.

PUBLIC HEARING:

A public hearing is not recommended.

RECOMMENDATION:

The Proponent should be issued a Licence for the alteration, construction, and operation of the wastewater treatment lagoon in accordance with the specifications, terms and conditions of the attached draft Licence. Enforcement of the Licence should be assigned to the Environmental Assessment and Licensing Branch until the liner testing has been completed and the Development is commissioned.

PREPARED BY:

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March 6, 2008

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