

SUMMARY OF COMMENTS/RECOMMENDATIONS

PROPOSER: Village of Glenboro
PROPOSAL NAME: Village of Glenboro Biosolids Removal and Land Application
CLASS OF DEVELOPMENT: 2
TYPE OF DEVELOPMENT: Waste/Scrap Wastewater Treatment Lagoons
CLIENT FILE NO.: 5208.00

OVERVIEW:

On July 17, 2006, the Department received a Proposal from AXYS Agronomics on behalf of the Village of Glenboro for the removal of biosolids from the primary cell of the existing wastewater treatment lagoon located on the northwest quarter of Section 10-7-14 WPM. The biosolids will be removed from the primary cell of the wastewater treatment lagoon and injected into agricultural land. The parcel of land onto which the biosolids will be applied by injection is the northeast quarter of Section 9-7-14 WPM, owned by F. Jefferies and leased by T. Mowat.

The Department, on August 16, 2006, placed copies of the Proposal in the Public Registries located at 123 Main St. (Union Station), the Winnipeg Public Library, the Western Manitoba Regional Library, and the Manitoba Eco-Network. Copies of the Proposal were also provided to the Technical Advisory Committee (TAC) members. The Department placed public notification of the Proposal in the Baldur Glenboro Gazette on Tuesday, August 22, 2006. The newspaper and TAC notifications invited responses until September 20, 2006.

COMMENTS FROM THE PUBLIC:

No responses were received from the public notification.

COMMENTS FROM THE TECHNICAL ADVISORY COMMITTEE:

Agriculture, Food and Rural Initiatives

- *Table 3.1*
 - *Nutrient removal rates are more properly reported in lb/ac or kg/ha, not ppm. Although it appears that the figures for nutrient removal rates are in a reasonable range, the table does not clearly indicate the units, which makes interpretation less than straightforward. Interpretation of the results would be made easier for the reader if the table was set up to clearly indicate the units.*
 - *Phosphorus removal is more properly expressed using the fertilizer equivalent P₂O₅ as opposed to elemental P which is used when reporting soil test phosphorus. Similarly, potassium removal should be on a K₂O basis rather than elemental K. Interpretation of the results would be made*

easier for the reader if the table was set up to clearly indicate the nutrient forms.

- *Table 3.2*
 - *What exactly is the surface water that was sampled?*
- *Sampling strategy:*
 - *What is the rationale behind separate sampling for agronomic purposes (the “farm soil nutrient samples”) and environmental (“environmental samples”)? Were different sampling patterns employed or were cores taken at the same locations throughout the field?*
- *Further analysis:*
 - *Autumn soil sampling of the candidate field should be conducted to confirm that nutrient levels have declined accordingly with the production of the 2006 crop. The level of production achieved during this growing season should also be reported (i.e. at the very least, general assessment of yield and quality).*

Proponent Response (September 29, 2006):

- Table 3.1 does indicate in the header (ppm) which is equivalent to mg/kg. It does convert these ppm readings to lb/ac on the third line of the table by a conversion factor that takes into account the bulk density of the soil down to 60 cm in depth. Removal rates are given as P2O5 equivalent but this is not indicated the Table. The final report submission for the project will clearly indicate all units.
- The surface water sampled was the surface water of the lagoon. This was sampled in a column of water taken by a one metre long bailer to provide an indication of the salinity and sodium adsorption ratio of the lagoon water that is mixed with the biosolids. On a one-time application rate basis, the electrical conductivity has no significant impact on the agricultural capability of the receiving soil.
- The environmental soil samples taken are intended to provide the required information to Manitoba Conservation, and the farm soil samples are intended to provide agronomic information to the farmer whose soil is receiving the biosolids.
- The “farm soil” report provides nutrient analysis in mg/kg converts this to lb/ac using a soil bulk density approximation, and provides fertilizer recommendations for the type of crop and yield goals that the farmer has for this particular field.
- The Environment Act Proposal requirements are that nutrient and metal analysis have to take place prior to submission of the EAP, even if the growing crop is still removing nutrients from the soil. An estimate is then made as to the crop removal for the remainder of the growing season in order to indicate the acceptability of this field for biosolids application. Prior to the application of biosolids in late October the field will be sampled from 0-60 cm in order to supply the farmer with the actual residual nutrient concentrations in the fall, along with the available nitrogen that biosolids will supply for the 2007 crop. The producer requires this information to ensure that the appropriate amount of inorganic fertilizer is applied in the spring in order to ensure the crop yield indicated by the farmer can be attained.

Disposition:

After receiving the additional information from the proponent, no further comments were received from Agriculture, Food and Rural Initiatives. This was assumed to indicate that the original comments were satisfied.

Conservation - Sustainable Resource & Policy Management

- *The proposal does not appear to address the potential for the release of odours and what mitigative measures might be undertaken to reduce any such impacts. Through the project is stated to occur over a 3 year period, there is no mention of the anticipated number of days per year that the dredging, pumping and injection will occur. One might anticipate that odours would be created from a dredging operation and also potentially from injection, unless application was undertaken in a way to minimize such releases.*

Proponent Response (September 29, 2006):

- The project will take place over a three to four day period in later October. The dredging equipment floating on the surface of the primary lagoon will pump the biosolids (approximately 6-8% solids) via a pipeline across the road to the adjacent agricultural field (100 yards) where it is connected to a nurse tank. The nurse tank provides the Terragators (application equipment) with an overhead hose to fill their tanks. The nurse tank is equipped with a shut-off mechanism to the dredging equipment that prevents overfilling the nurse tank. The Terragators are fitted with shanks spaced two feet apart that inject the biosolids to a depth of 15-18 cm. The biosolids are applied such that there is no ponding of biosolids on the soil surface. There is virtually no odour associated with this application method.

Disposition:

After receiving the additional information from the proponent, no further comments were received from Sustainable Resource & Policy Management. This was assumed to indicate that the original comments were satisfied.

Water Stewardship

- *Locations of any potable water sources within the vicinity of the proposed project were not mentioned. It is not clear whether the local residents have access to treated water supply.*
- *Section 4.3 and 4.5 discussed the impacts on surface water and groundwater. It is unclear whether the consultant is proposing any monitoring methods to ensure that the risks are minimal.*
- *The proposed activities should not degrade the groundwater and surface water qualities on adjacent properties and make these unsuitable for use as drinking water sources. The consultant should identify such activities and recommend appropriate mitigation measures if required.*
- *Fisheries Branch has reviewed the application for dredging the lagoon and injecting the biosolids into NW 10-7-14 W and has no fisheries concerns given the distance to the nearest surface water (Cypress River), the fact the biosolids will*

- be injected (15 cm) and not broadcasted, the field has minimal tillage and there will be a 15m set back distance from two low lying wetlands in the field.*
- *The calculations used in Table 3.3 needs to be clarified. The background soil analysis data is reported to be in mg/kg although the data used in the table refers to the N soil fertility of 75 lbs/acre. Is this correct?*
 - *In Table 3.3 the cumulative soil and biosolids loading is calculated as the addition of the biosolids loading rate (kg/ha) and background soil analysis (mg/kg). Are these units correct?*
 - *In Table 3.3 it is also indicated that the cumulative weight of phosphorus allowed by the licence is 108 kg/ha. It should be noted that the applicant should have sufficient land so that application of biosolids can be applied at one times crop removal rate to remain within the 60 ppm soil phosphorus threshold.*
 - *The proposed injection land overlies a portion of the Assiniboine Delta aquifer. Based on the water well logs the aquifer is locally overlain by up to a few meters of low permeability materials. This setting would indicate that there is a significant vulnerability for nutrients applied at the land surface to migrate into the underlying aquifer. That being said, the proposed N application rates are quite low and there is an expectation that N release may be quite slow, related to breakdown of organic matter in the biosolids. Consequently, it would seem that there should not be a significant concern regarding nitrate loading to the underlying groundwaters from biosolids application and annual crop growth on the land.*
 - *The proponent does not appear to have addressed the issue of the land owner where the biosolids will be applied incorporating the N generated from biosolids application in his nutrient application planning. If this is not done, N may be over-applied leading to increased N leaching.*
 - *There was no discussion of the microbial aspects of biosolids application, particularly the expected life of various bacteria, protozoa, and viruses that may be in this material. Is there a risk from microbial runoff or leaching?*
 - *My understanding is that some jurisdictions will not allow subsequent re-application of biosolids to a receiving field for a period of some years after the initial application. I see no mention of this in the proposal.*

Proponent Response (September 29, 2006):

- The town of Glenboro uses individual wells for domestic water consumption.
- Many mitigative measures are involved with this project:
 - The dominant soil series is a Wellwood sandy clay loam to clay loam;
 - Application is in the late fall, which prevents the conversion of ammonium to nitrate;
 - The biosolids are mainly organic nitrogen that will nitrify over the next three years;
 - The biosolids are injected; and
 - Microbial activity on these Class 1 Agricultural Capability soils provides for enhanced consumption of pathogens would indicate that no follow up monitoring is required.

- The proposal outlines that minimal setback distances are part of the mitigative measures in place for this project.
- An example of the calculations used to determine loading rates is found below. The sample calculations for both biosolids and cumulative loading rates are found below:

Biosolids Loading Rate of Copper

* assumes a liquid density of 1kg/liter

Biosolids loading rate (Copper) = application rate x concentration
190,910 liters/hectare applied x 5.21 mg/L Copper / 1,000,000 mg/kg
= 0.995 kg/ha Copper applied.

Cumulative Loading Rate for Copper

* assumes a soil density of 1200 kg/m³

Cumulative Loading rate (Copper) = biosolids loading rate + soil loading rate
= 0.995 kg/ha + (9.0 mg Copper/kg x 1200 kg/m³ x 10,000 m²/ha x 0.15 m / 1,000,000 mg/kg)
= 0.995 kg/ha + 16.2 kg/ha = 17.2 kg/ha total Copper (Licence limit is 113.4 kg/ha)

- The cumulative weight of phosphorus in the Licence (108 kg/ha) is a combination of soil plant available biosolids phosphorus. Whereas the Licence limit is 108 kg/ha, the actual value for this land is 28.7 kg/ha.
- The mitigative measures for this project are multiple and include but are not limited to:
 - Application onto a soil ranging from sandy clay loam to clay loam;
 - Late fall application; and
 - Application of only a partial nitrogen requirement for the 2007 crop.
- Also included is a final summary to the farmer to ensure knowledge of the value of the biosolids that have been applied to the land.
- The soil will be resampled prior to the biosolids application to determine the final residual nutrients. The farmer will be given a report that indicates the residual nutrients on the field and the anticipated available nitrogen from the biosolids. In this way the farmer can determine the fertilizer requirements for a particular yield goal.
- Soil bacteria in a nitrogen rich environment routinely consume carbonaceous material to support growth. These robust indigenous microbial populations routinely attack and degrade pesticides as well as pathogens and other recalcitrant materials as part of their metabolism. Fine grained soils hold both nutrients and bacteria due to their exposed clay surfaces and large surface areas. There is little risk of either runoff or leaching on this Class 1 Agricultural Capability land.
- The Town of Glenboro lagoon has not had the biosolids removed since it was built. Thus, if this removal occurs once every 25 years, the same Licence conditions would apply in order for the same land to have biosolids applied again.

Disposition:

- The proponent response was reviewed and the Department has no concerns or comments.
- 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 Assiniboine River and/or associated waterways and watersheds.

Culture, Heritage and Tourism - Historic Resources

- *No concerns*

Health

Please ensure:

- *Prevention of pollutants or contaminated wastewater from entering sewage disposal, municipal ditch systems, adjacent yard site and wetland areas.*
- *odor control and monitoring*
- *gasoline and diesel regulations if applicable.*

Disposition:

- 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.

Transportation and Government Services

- *No concerns*

Intergovernmental Affairs

- *No concerns.*

Canadian Environmental Assessment Agency

- *Following a review by all federal departments with a potential interest in the proposed development, the application of the CEAA will not be required.*
- *Health Canada possesses expert knowledge that could assist in the environmental review of the project.*

PUBLIC HEARING:

A public hearing is not recommended.

RECOMMENDATION:

The Proponent should be issued a Licence for the remediation, expansion 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

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to the Environmental Assessment and Licensing Branch until the liner testing has been completed and the Development is commissioned.

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