

MMM Group Limited  
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**Via Email**

November 17, 2015

Ref.: 3315438-000\_BMO.710

Ms. Tracy Braun  
Director  
Manitoba Conservation and Water Stewardship  
Environmental Approval  
123 Main Street, Suite 160  
Winnipeg MB R3C 1A5

Dear Ms. Braun:

**RE: Year End Report on City of Steinbach Land Application of Sludge – Aerated  
Wastewater Treatment Lagoon License #3136**

**Introduction**

MMM Group Limited (MMM) has been retained by the City of Steinbach (Steinbach) to complete a biosolid land application program for Cell 2 of its wastewater lagoon. Assiniboine Injections Limited was contracted by Steinbach to complete the application program. On October 2, 2015, MMM submitted, application prescription rates, background soil parameters and cumulative heavy metal weights as per Schedule A of the EAL #3136 to Manitoba Conservation and Water Stewardship (MCWS) and are also appended to this letter. Approval to proceed was received October 23, 2015.

**Field Program**

MMM conducted sludge sampling of Cell 2 on July 22, 2015, for analysis by ALS Laboratories. Soil sampling was conducted on September 23, 2015, on four agricultural fields located at SE08-7-6EPM, SE09-7-6EPM, NW10-7-6EPM and NW11-7-6EPM. Soil testing was conducted at a Global Position System (GPS) referenced waypoint at two locations for fields SE08-7-6EPM and SE09-7-6EPM and at one location for fields NW10-7-6EPM and NW11-7-6EPM. A Dutch auger was used to sample eight locations in an approximate 10 m circle around the GPS waypoint. Samples were taken at soil depth of zero to 15 cm for nutrients and metals, and 15 to 60 cm was sampled for nitrogen and sulfate-sulphur only. The eight samples taken at each waypoint were placed in a plastic pail and mixed to provide a composite sample. The georeferenced location was marked using a Garmin GPSmap 62st for annual follow-up sampling for the next three consecutive years. Soil samples were placed in a cooler with ice and submitted to ALS Laboratories on the same day.

MMM staff hosted a project kick-off meeting with MCWS Environment Officer - Curt Bueckert, Assiniboine Injections – Noel Boisvert and City of Steinbach Water and Waste Department staff. MMM staff conducted three site visits on October 25, 27 and 29 for monitoring. The land application of Cell 2 biosolids were applied to the field SE09-7-6EPM from October 23 to October 30, 2015. The field applied had recently been harvested of a soybean crop. Assiniboine Injections used a floating dredge on Cell 2 and pumped the biosolids material to a holding tank located at the field site. A tracked tractor then injected the biosolids approximately 20 cm below ground surface. MMM was present to evaluate licenced parameters such as setback distances, excessive puddling and compaction; daily monitoring logs are attached.

During the site visits, MMM staff observed that setback distances were being followed, some minor puddling occurred, immediately after application and when the hose was being dragged over the soil, compacting it. No odour was observed during the application process. Assiniboine Injections reported a daily average application rate between 288,000 and 335,000 litre per ha with a daily average percent solids between 2.5 and 3.55%.

Attached are the daily application parameters as per Assiniboine Injection, as well as a field sketch of the daily application locations.

### **Future Monitoring**

Steinbach is committed to annual post-harvest soil testing for SE09-7-6EPM in 2016, 2017 and 2018 for Nitrate-N (0-60cm) and phosphorous using Olsen-P test (0-15cm). Using the GPS coordinates taken in 2015 (1. 664961.00 m E, 5490892.00 m N and 2. 665426.00 m E, 5491081.00 m N), soil samples will be conducted at the same location after the farm producer has harvested their crop. The same procedure will be followed as was undertaken during the initial background soil testing described above. Supplemental information such as supplemental fertilizer sources and rates, crop rotation and yields will be included in the monitoring program.

### **Conclusions**

MMM was retained by Steinbach to complete a biosolid land application program for Cell 2 of their wastewater lagoon. The land application was completed on October 30, 2015, and required 46 ha of land, all located on field SE09-7-6EPM, with an average daily application rate of 305,126 litre per hectare with average percent solids of 3.20%. MMM will continue to monitor the land applied field (SE09-7-6EPM) annually and report results to MCWS.

EAL #3136 permits the land application of biosolids from aeration Cell 1 along with Cell 2 and it is likely that the City of Steinbach will proceed with this land application at an appropriate time prior to the licence expiration.

Should you have any questions please feel free to contact me at 204.943-3178 or via email at [moonsb@mmm.ca](mailto:moonsb@mmm.ca).

Yours truly,

**MMM Group Limited**



Brian Moons, B.Sc.  
Biologist  
Dated: November 17, 2015

BM/tc

Reviewed by:



Darren Keam, M.Sc., P.Ag.  
Project Manager  
Dated: November 17, 2015



Photo 1. Assiniboine Injections dredge on Cell 2.



Photo 2. Post application on field. Note setback distance of residential property line.



Date Taken: October 25, 2015

Client: City of Steinbach

Taken by: BMoons

Location: Steinbach, MB

Project No.: 3315438



Photo 3. Holding tank and pump for application.



Photo 4. Hose carrying sludge from Cell 2 to field holding tank.



Date Taken: October 27, 2015

Client: City of Steinbach

Taken by: BMoons

Location: Steinbach, MB

Project No.: 3315438

Table 1. Daily application values as per Assiniboine Injections.

Daily application parameters	Application Dates								Totals
	23-Oct-15	24-Oct-15	25-Oct-15	26-Oct-15	27-Oct-15	28-Oct-15	29-Oct-15	30-Oct-15	
Volume applied (m <sup>3</sup> )	528	1,878	2,055	2,169	2,230	2,248	2,274	879	14,260
Volume applied (gallons)	116,279	413,131	452,062	477,088	490,568	494,650	500,186	193,271	3,137,235
Area applied (acres)	4.5	16.1	16.9	16.0	18.2	18.2	17.7	7.2	114.8
Rate (gallons/acre)	25,955	25,644	26,765	29,837	26,925	27,253	28,291	26,695	-
Area applied (hectares)	1.8	6.5	6.8	6.5	7.4	7.3	7.2	2.9	46.4
Rate (liters/hectare)	290,696	287,213	299,768	334,174	301,560	305,234	316,859	298,984	-
Average Solids (%)	3.5	3.5	3.1	3.2	3.6	3.2	3.0	2.5	-

# ASSINIBOINE INJECTIONS LTD

BOX 160 126 NOTRE DAME AVE E NOTRE DAME, MANITOBA ROG 1M0

PH: 204-248-2559 FAX: 204-248-2799 SHOP: 204-749-2123 CEL: 204-745-7235, 204-745-8310

## DAILY APPLICATION PLAN

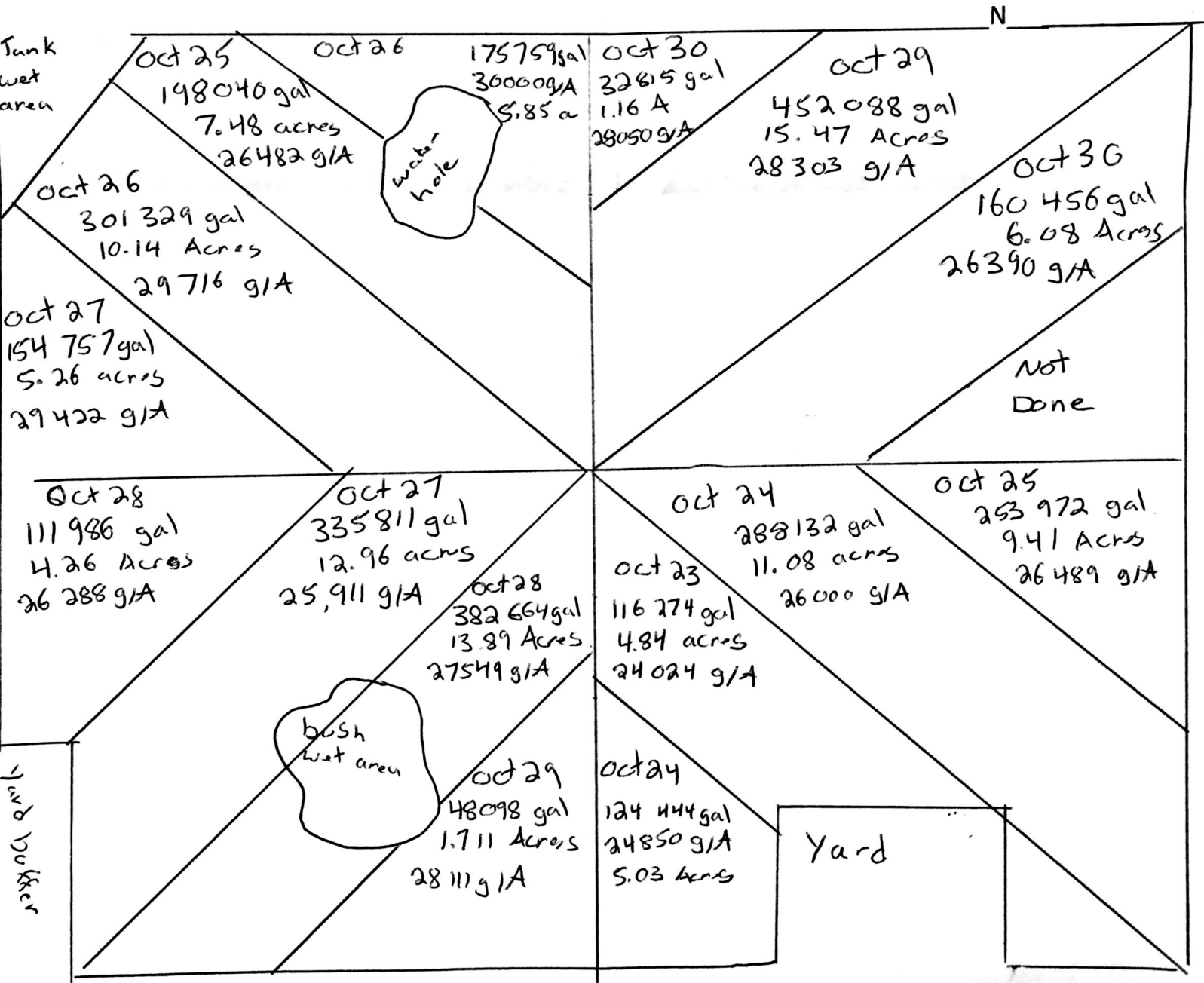
FARMER: \_\_\_\_\_

FIELD: \_\_\_\_\_

APPLICATION TYPE: LAND INJECTION

DEPTH: \_\_\_\_\_ HA: \_\_\_\_\_ CUBIC METERS: \_\_\_\_\_

DATE: \_\_\_\_\_





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# Biosolid Land Application Report

Project Name: Steinbach Biosolids.

Project No: 3315438

Field Location: SE-9

Client: City of Steinbach

Site Visit Date: 2015-10-25

Field Staff: B. Moons

Contractor: Assiniboine Injections.

Weather: sunny, 0°C

Rates (as per Contractor):

Igal/acre: 27,000

% Solids: 3.5-3.8

Setback (Buffer) Distances:

- 75 m from any occupied residence  Yes  No  N/A
- 400 metres from a residential area  Yes  No  N/A
- 8 metres from a major wetland, bog, marsh or swamp  Yes  No  N/A **BM**
- 15 metres from a first order waterway  Yes  No  N/A
- 30 metres from a second order or higher order waterway  Yes  No  N/A
- 50 meters from a groundwater well  Yes  No  N/A
- Other:

Observations:

Excessive compaction? No.

Pipe blowouts? No.

Puddling? No.

Comments:

No odour.  
Tracked tractor injecting @ ~8" deep.





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# Biosolid Land Application Report

Project Name: *Stenbach Biosolids*

Project No: *3315438*

Field Location: *SE-9*

Client: *Stenbach*

Site Visit Date: *2015-10-27*

Field Staff: *BMoons*

Contractor: *Assiniboia Injections*

Weather: *Cloudy, 5°C, windy*

Rates (as per Contractor):

Igal/acre: *27,000.*

% Solids: *3.0-3.2.*

Setback (Buffer) Distances:

- 75 m from any occupied residence  Yes  No  N/A
- 400 metres from a residential area  Yes  No  N/A
- 8 metres from a major wetland, bog, marsh or swamp  Yes  No  N/A *BM*
- 15 metres from a first order waterway  Yes  No  N/A
- 30 metres from a second order or higher order waterway  Yes  No  N/A
- 50 meters from a groundwater well  Yes  No  N/A
- Other:

Observations:

Excessive compaction? *No, some compaction at field approach. L Noel spoke to farmer who was not concerned w/ compaction.*

Pipe blowouts? *None*

Puddling? *Not excessive.*

Comments:

*No odour; lagoon 1/2 dredged, field < 1/2 applied.*



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# Biosolid Land Application Report

Project Name: *Steinbach Biosolids*  
 Field Location: *SE-9*  
 Client: *City of Steinbach*  
 Site Visit Date: *2015-10-29*  
 Contractor: *Assiniboine Injection*  
 Weather: *Cloudy, 5°C, windy*

Project No: *3315438*  
 Field Staff: *Bonners*

Rates (as per Contractor):  
 lgal/acre: *27,000*  
 % Solids: *3.0-3.5*

Setback (Buffer) Distances:

- 75 m from any occupied residence  Yes  No  N/A
- 400 metres from a residential area  Yes  No  N/A
- 8 metres from a major wetland, bog, marsh or swamp  Yes  No  N/A
- 15 metres from a first order waterway  Yes  No  N/A
- 30 metres from a second order or higher order waterway  Yes  No  N/A
- 50 meters from a groundwater well  Yes  No  N/A
- Other:

Observations:

Excessive compaction?  
*Some compaction @ field approach.*

Pipe blowouts?  
*None.*

Puddling?  
*Some puddling after pipe travels across recently injected soil.*

Comments: