



BEAVER REGIONAL WASTE MANAGEMENT SERVICES COMMISSION

Innovative Solutions
for a Changing World

BEAVER MUNICIPAL SOLUTIONS COPPICE WILLOW SYSTEM USING LAND APPLICATION OF CITY OF EDMONTON BIOSOLIDS GENERATED BY MUNICIPAL WASTEWATER TREATMENT PLANTS

Remediation Technologies Symposium 2014 –
October 16, 2014 – Environmental Services
Association of Alberta, Banff AB

PROJECT OVERVIEW

- Dewatered biosolids from Goldbar plant
- Transport to Beaver County – 1 hr from Edmonton
 - Winter stockpile 2013
 - Spring land application 2014
- Coppice willows and agricultural crops

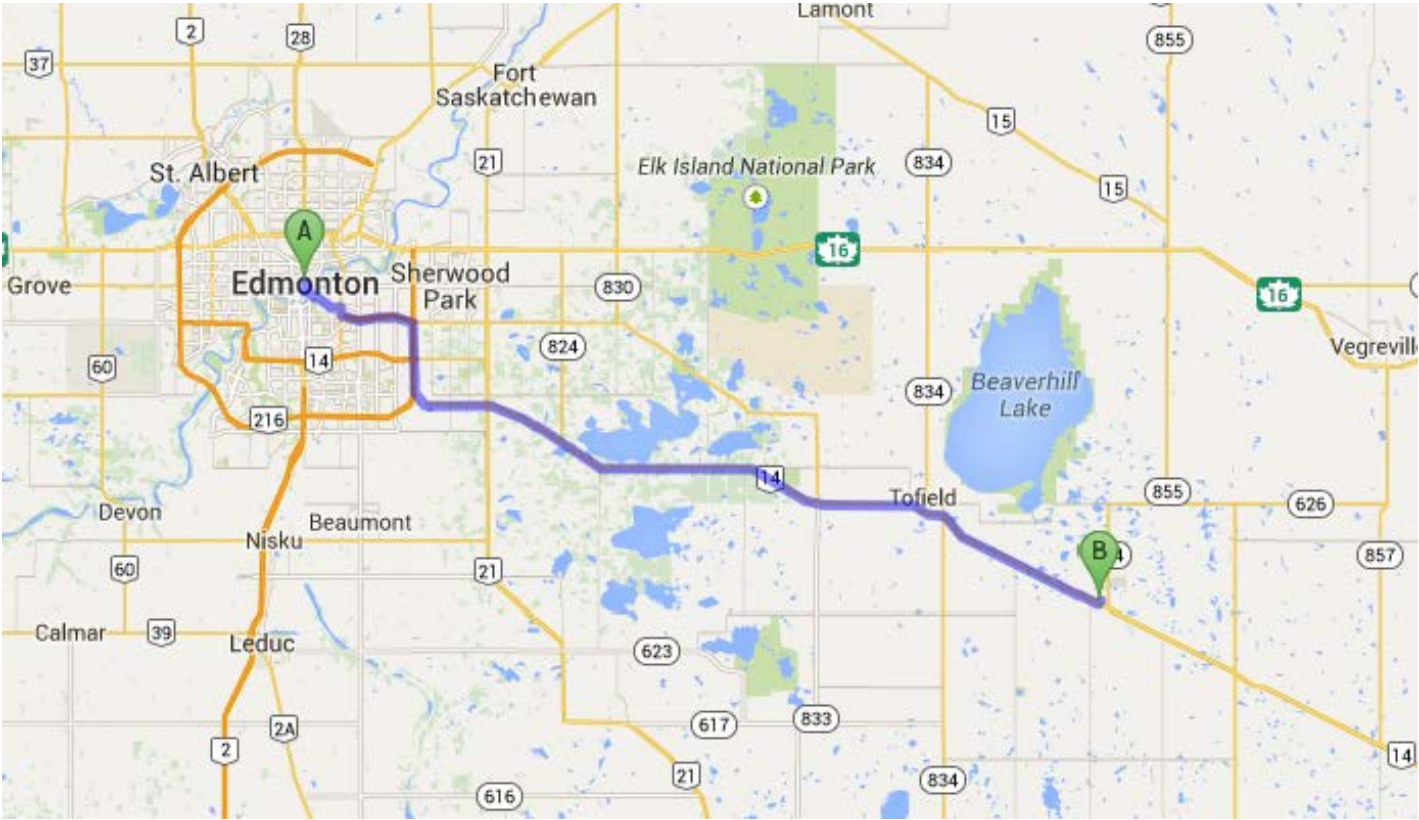
BIOSOLIDS

- Treated and stabilized solids from municipal wastewater treatment
 - Treatment to capitalize on beneficial properties (*not sludge or septage*)
- Benefits include nutrients and organic matter
 - Intensively researched with respect to environmental protection and human health

PROJECT RATIONALE

- Increase application rates – 25, 45 and 64 dry tonnes per hectare, gypsum addition
 - Improve solonetzic soils for agriculture
- Introduce short-rotation coppice willow as bio-crop
- Partners: Edmonton, EPCOR, Sylvis Environmental

PROJECT LOCATION



PROJECT LOCATION



SITE SELECTION

15 APPENDIX FOUR – PHOTOGRAPHS



Photograph 1: A portion of the southern half of 4-51-17-W4M (May 2013).



Photograph 2: A portion of the southern half of 4-51-17-W4M (May 2013).



Photograph 3: A portion of NW21-50-17-W4M (May 2013).

SITE SELECTION

Figure 3: Site overview for the southern half of section 4-51-17-W4M.



SITE SELECTION

Figure 4: Treatment layout for the southern portion of the southern half of section 4-51-17-W4M.



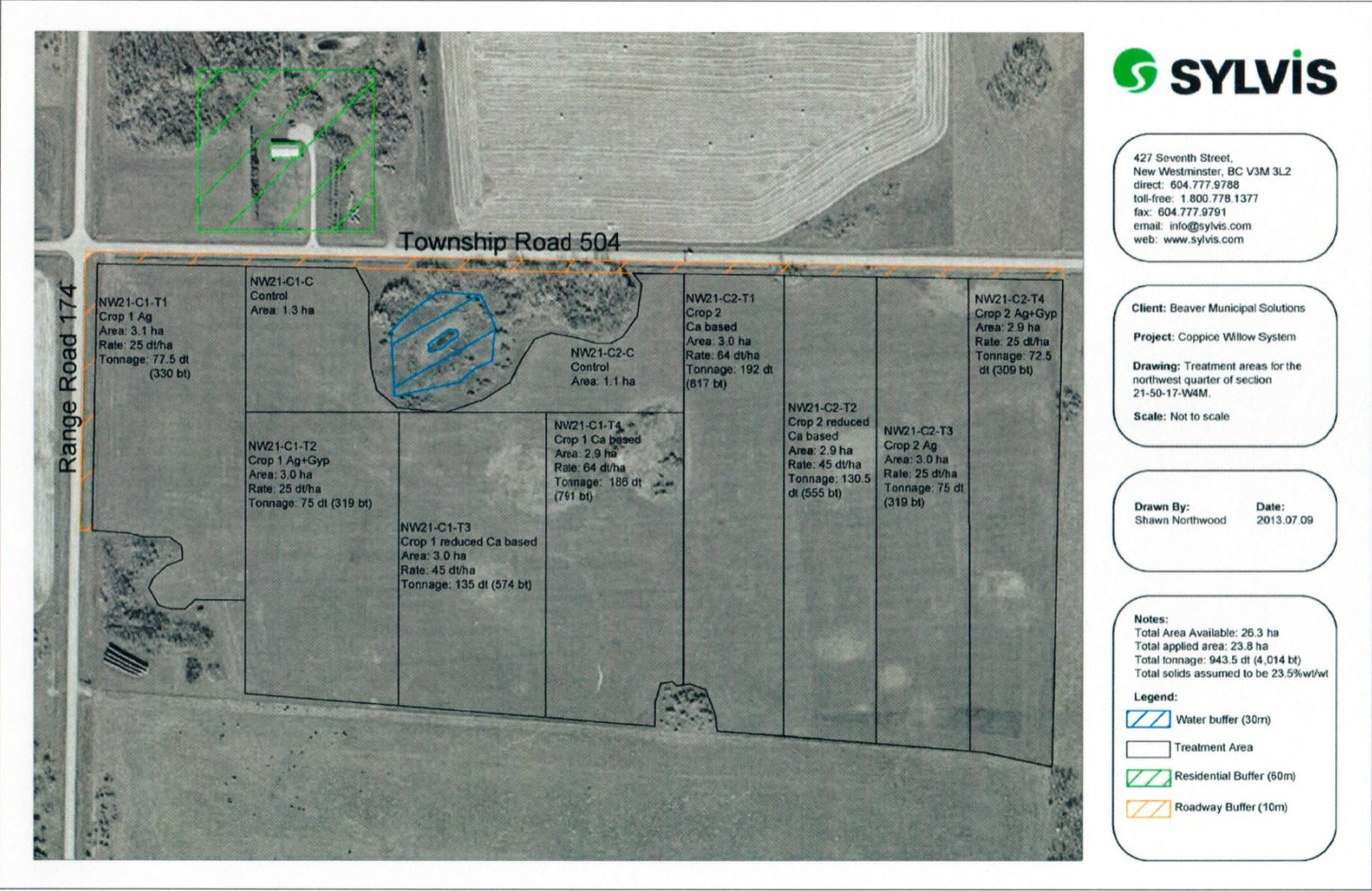
SITE SELECTION

Figure 5: Site overview for the northwestern quarter of section 21-50-17-W4M.



SITE SELECTION

Figure 6: Treatment layout for NW-21-50-17-W4M.



March 8, 2013

Fernando Sacluti
General Supervisor, Technical Services
City of Edmonton
Century Place
9803 102A Avenue
Edmonton, AB T5J 3A3

Dear Mr. Sacluti:

Re: Biosolids Demonstration Project: Beaver Municipal Solutions Site Pilot

The proposal of January 18, 2013 regarding the biosolids application pilot project at the Beaver Municipal Solutions site has been reviewed relative to the requirements of the *Environmental Protection and Enhancement Act* and the terms and conditions of your current approval.

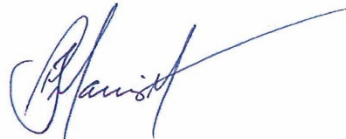
Based on the information provided, the activity proposed is considered to fall into the category pursuant to Section 67(3)(c) of the *Environmental Protection and Enhancement Act*:

c. *short-term testing or temporary modifications to machinery, equipment or processes that do not cause an adverse effect.*

We, therefore, have no objection to you proceeding with the project as described in your proposal, but remind you of your obligation to comply with the existing approval.

Please continue to keep Alberta Environment and Sustainable Resource Development informed on the progress and ultimate outcome of your study. If you have any questions on the above matter, please contact David Curran at (780) 415-9680.

Yours truly,



Patrick Marriott, P. Eng.
District Approvals Manager
Northern Region
(Designated Director under the Act)

cc: Allan Yee, City of Edmonton
Allan Mumby, EPCOR
Mark Teshima, Sylvis Environmental
Harshan Radhakrishnan, ESRD
David Curran, ESRD

PUBLIC CONSULTATION

171043008, 171043017, 171044016, 171044,089

BEAVER COUNTY DEVELOPMENT PERMIT

PERMIT NO.: 020020-13-D0087
PROPOSED USE: Intensive Agricultural - Growing Opportunities with Biosolids – A demonstration Project: Proposed Land Application of Biosolids for Trial Establishment of Short-rotation Willow Plantation
APPLICANT: Beaver Regional Waste Management Services Commission
OWNER: Lyons, Brian and Convey-Lyons, Loretta
LOCATION: S ½ of 4-51-17-W4

A development involving Application No. 020020-13-D0087 has been Approved With the following Conditions:

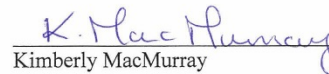
1. Developer will enter and comply with a road use agreement yearly.
2. Development permit is valid from October 9, 2013 to March 31, 2015. Upon the expiration of the development permit an extension may be granted. The County is not liable for any cost involved in the cessation or removal of the development upon the expiration of the time limit, if an extension or new permit is not granted.

You are hereby authorized to proceed with the development specified, provided that any stated conditions are complied with, that development is in accordance with the application and attached site plan, that all other applicable permits are obtained, and that the appropriate appeal period has been exhausted. Should an appeal be made against this decision to the Subdivision and Development Appeal Board, this Development Permit shall not come into effect until the appeal has been determined and the Permit upheld, modified or nullified.

DATE OF DECISION: September 17, 2013

DATE OF ISSUE OF DEVELOPMENT PERMIT: **September 17, 2013**

SIGNATURE OF DEVELOPMENT OFFICER:


Kimberly MacMurray

ENVIRONMENTAL CONTROLS



TRANSPORT



STOCKPILING



LAND APPLICATION



TILLING



SPREADING



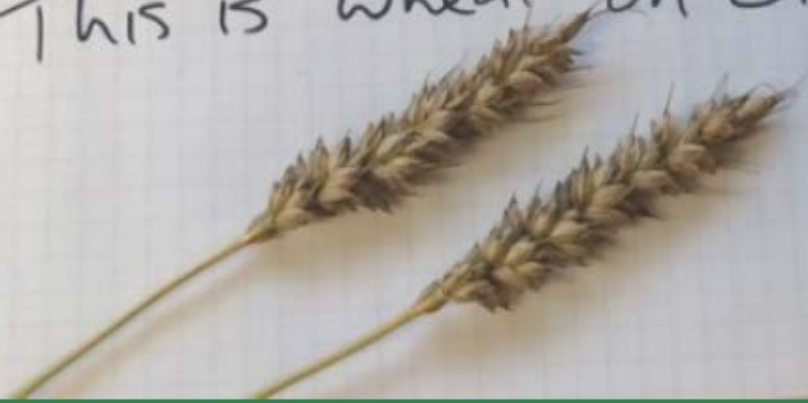
WHEAT CROP



This is wheat :



This is wheat on biosolids



any
questions?

Average crop measurements by treatment type

Treatment	Dry Yield (kg/ha)	Protein (%)	Protein Yield (kg/ha)
Control	3244	18.4%	594
25 dt/ha + Gypsum	4333	19.4%	772
25 dt/ha	4533	19.7%	864
45 dt/ha	4733	20.1%	922
64 dt/ha	4967	19.5%	966

These are averages based on four samples from each treatment. Each sample was composed of three 50 cm x 50 cm clip plots.

Biosolids applications significantly increased dry yield when compared to control at all treatment levels. Biosolids applications demonstrated marginally higher (not statistically significant) protein when compared to control at all treatment levels. The total protein yield is significantly higher at all treatment levels versus control.

FUTURE PLANTING
WILLOW BIOMASS



CONCLUSION

