



**CONESTOGA-ROVERS  
& ASSOCIATES**

651 Colby Drive, Waterloo, Ontario, Canada N2V 1C2  
Telephone: (519) 884-0510 Facsimile: (519) 884-0525  
[www.CRAworld.com](http://www.CRAworld.com)

December 9, 2011

Reference No. 046254

Director  
Ontario Ministry of the Environment  
Environmental Assessment and Approvals Branch  
2 St. Clair Avenue West  
Floor 12A  
Toronto, ON M4V 1L5

Dear Sir or Madam:

Re: Effluent Management Plan Report  
Woolwich Bio-En Inc., Elmira, Ontario

## 1.0 INTRODUCTION

Conestoga-Rovers & Associates (CRA) provides this letter, on behalf of Woolwich Bio-En Inc. (Bio-En), to meet the requirements of the Effluent Management Plan Report as outlined the Ontario Ministry of the Environment's (MOE's) Ontario Renewable Energy Approval (REA) Regulation (O.Reg. 359/09). This Effluent Management Plan Report supports Bio-En's Application for REA for the proposed Anaerobic Digestion (AD) facility (Facility) to be located at 40 Martin's Lane in Elmira, Ontario.

## 2.0 DESCRIPTION OF SEWAGE EXPECTED FROM THE FACILITY

### 2.1 Storm Water

A complete Surface Water Assessment (SWA) Report was prepared by The WalterFedy Partnership (TWFP) for the storm water requirements of the Facility. Storm water discussions in this report are excerpts from the SWA Report prepared by TWFP. The SWA Report has been submitted under a separate cover in support of the Application for REA.

Computer modelling was used to generate hydrographs and calculate peak flow rates and runoff volumes for the 5, 25, and 100-year Chicago design storms. The site is characterized by a single catchment under both existing and proposed conditions. The calculated runoff volumes and peak flows for each design storm under existing and proposed conditions are summarized in the SWA report. The storm water management facility is designed to provide normal



(70 percent long-term suspended solids removal) quality control, in accordance with MOE guidelines, and to reduce the peak flow rate after development to less than pre-development levels for the 5-year and 100-year rainfall events.

## 2.2 Process Effluent

The AD process has one main product, biogas, and one by-product, digestate. Digestate is the nutrient rich solid and liquid by-product of the AD process. Bio-En intends to separate the digestate into liquid (approximately 4 percent dry weight) and solid fractions (approximately 27 percent dry weight) prior to being shipped off-site or reused in the process.

As material is dosed into the digestion tanks an equal volume of digested substrate, or digestate, overflows to the secondary digester and repository tank. The secondary digester and repository tank have a total available volume of 4,310 m<sup>3</sup>. It is anticipated that the secondary digester and repository tank will have approximately 30 days storage capacity.

The digestate will be pumped from the digestion tanks through a solids separator. The liquid portion of the digestate will be recirculated back into the AD process through the process water tank as an inoculant or will be pumped to the secondary digester and repository tank to await off-site transport by a third-party hauler, and eventual land application. The solid portion of the digestate will be stored in a bin in the process building and transported off site by a third-party hauler and will be applied to land as a nutrient source and soil conditioning agent (soil amendment), or sold as a Canadian Food Inspection Agency (CFIA) approved fertilizer. The third-party hauler will assume all liability for the final use and disposal of the digestate material as part of its contract with Bio-En and will provide additional off-site storage as required.

The digestate will be evaluated and monitored regularly in accordance with the sampling program designed by Bio-En or a third-party hauler in cooperation with the CFIA. The monitoring program will ensure that the digestate is acceptable for land application or as a CFIA approved fertilizer material.

## 2.3 Sanitary Sewer

The proposed Facility will be serviced by the Town of Elmira's sanitary services. The sanitary services need to be extended with the extension of Martin's Lane. The only discharge to the sanitary service will be from the toilet, shower, and sink in the Operations Building.



### 3.0 METHODS OF SEWAGE TREATMENT AND DISPOSAL

The only sewage that will be treated at the Facility will be storm water runoff, as noted above. Any discharge to the sanitary sewer will be from sources related to personal hygiene and the process liquids will be transported off-site by a third-party hauler.

#### 3.1 Storm water Management Facility

##### 3.1.1 Site Level and Conveyance Controls

Site grading drains from north to south, which is consistent with the existing topography. Surface sheet flow is proposed from all paved surfaces given the generous amount of topographic fall on the site. This runoff is captured by on-site swales and directed to the on-site storm water management pond. Swales are grass lined in upland areas where limited surface runoff is conveyed by the swales. The primary swale draining to the storm water management pond is proposed to be armoured with riprap. No infiltration measures are proposed due to the clay soils present on site.

##### 3.1.2 End of Pipe Facility

The storm water management wet pond was designed to provide both quality and quantity control. The pond is designed to provide normal (70 percent long-term suspended solids removal) quality control, in accordance with MOE guidelines, and to reduce the peak flow rate after development to less than pre-development levels for the 5-year and 100-year rainfall events.

While a "normal" level of treatment is appropriate considering the length of urban swale that the discharge will be conveyed through prior to discharge to Canagagigue Creek, it is noted that the proposed pond exceeds the requirements for an "enhanced" level of protection as described in the MOE SWMPD Manual.

##### 3.1.3 Storm water Quantity Control

The storm water pond is designed to provide quantity control for the 5 through 100-year storm events via a staged pond outlet structure. Low flows are released from the pond via a 200 mm diameter outlet pipe. High flows are released from the pond via a 1.4 m wide emergency overflow weir. This overflow weir will release water during the 25 year and larger storm events. This control is designed to reduce the peak flow rate from land north of Martin's Lane (at the pond outlet) so that the peak flow combined with flow from Elmira Machine Industries, to the west at the culvert under Martin's Lane and the industrial building south of Martin's Lane, is less than the peak flow under existing conditions.



### 3.1.4 Storm Water Quality Control

Quality control is required for the proposed site. Quality treatment requirements shall be met through provision of an appropriate permanent pool volume in the wet pond sized in accordance with Table 3.2 of the MOE SMM PD Manual.

The low flow pond outlet is equipped with a sluice gate that may be closed in the event of a spill on the property. In the closed position, the pond will provide a minimum capture volume of 300 cubic metres prior to discharge occurring via the emergency overflow weir. In the case of an on-site spill, a pumper truck will be called to empty the pond and remove its contents from the site for treatment if required.

### 3.1.5 Erosion and Sediment Control During Construction

Sediment and erosion controls to be implemented during construction shall include a perimeter silt fence, coir log check dams, rock check dams, intermediate silt fence, temporary vegetation, rock rip rap channel linings and geotextile erosion control matting in accordance with the Sediment and Erosion Control Plan. Sediment traps shall be inspected to ensure that they have been properly installed and continue to function as designed. The controls shall be maintained and accumulated sediments removed once their capture capacity has been decreased by one-third. The outlets shall also be inspected for signs of sediment migration off site. In the event that sediments have migrated off site, additional sediment controls shall be implemented as necessary to ensure that no additional sediment escapes from the site and any sediment that has migrated off-site shall be removed.

The permanent sediment basin shall be constructed initially and dredged prior to commissioning of the site to ensure optimal operational efficiency. It is proposed that during construction activities, visual monitoring will be conducted bi-weekly and within 24 hours of any rainfall event of 12 mm or greater. During the construction period, monitoring shall consist of visual observation for the effectiveness of the sediment and erosion controls and sediment migration off-site. The monitoring program conducted during construction shall consist of visual inspections and a written log. Construction inspections shall be conducted until such time as the construction activities are complete and vegetation has established itself to a density equivalent to 70 percent of the background native vegetation density.



#### 4.0 MITIGATION MEASURES

##### 4.1 Storm water

The site SWA Report provided with the REA Application describes how site conveyance controls are designed to minimize the impact of the proposed development on the municipal and private storm water collection system and receiving waters. An end of pipe storm water management wet pond is designed to provide Normal quality control and to reduce peak flow rates post-development to pre-development levels for events up to, and including, the 100-year storm event.

##### 4.2 Process Effluent

Process effluent will be transported off-site by a third-party hauler. Liquid digestate will be transported in well-maintained tanker trucks and all drivers will be trained in spill clean-up protocols. The process effluent is not expected to result in any negative environmental effects on the quality of any water. The process effluent will be stored in a reinforced concrete tank that has been designed with a live load factor of 1.5 until transported off-site. The process effluent is expected to be land-applied as a soil amendment or fertilizer in the agricultural industry as noted above.

The liquid feedstock receiving tanks and the transformer are equipped with secondary containment in the event of a spill. This containment complies with the "Guidelines for Environmental Protection Measures at Chemical and Waste Storage Sites - May 2007".

##### 4.3 Sanitary Sewer

The effluent being discharged to the sanitary sewer will result from personal hygiene activities. The effluent will not be treated prior to discharge to the sanitary sewer; however, the effluent will be treated by the Municipality via their treatment facilities. An existing 150 mm diameter sanitary sewer is located in Martin's Lane that terminates at a manhole along the frontage of the existing industrial and commercial buildings along Martin's Lane. A 150 mm sanitary sewer service will be constructed from the site to this manhole within the traveled portion of the private road.

#### 5.0 CONCLUSIONS

The Bio-En Facility will be implementing a SWA report that meets the requirements of the governing regulatory agencies. Bio-En has conducted pre-consultation with the Township, the GRCA and the MOE regarding the storm water management requirements. The storm water



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from the site will be discharged into the municipal storm water collection system or used in the process. The effluent from the process will be handled by a third party hauler and will be used as a soil amendment or a fertilizer in the agricultural industry. The effluent discharged to the sanitary sewer is a result of personal hygiene activities at the Facility.

Should you have any questions please do not hesitate to contact us.

Yours truly,

CONESTOGA-ROVERS & ASSOCIATES

John Ferguson, P. Eng.

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