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Ministry of the Environment and Climate Change
Ministère de l'Environnement et de l'Action en matière de changement
climatique

AMENDMENT TO RENEWABLE ENERGY APPROVAL

NUMBER 6428-8LGLBH
Issue Date: December 7, 2015

Woolwich Bio-En Inc.
4 Arthur St N
Elmira, Ontario
N3B 3A2

Site Location: Woolwich Bio-En Inc.
50 Martin's Lane Lot 18 and 89, Part 9, Ref. Plan 58R-14363, Elmira
Woolwich Township, Regional Municipality of Waterloo
N3B 3A2

You are hereby notified that I have amended Approval No. 6428-8LGLBH issued on March 26, 2012 for a Class 3 anaerobic digestion facility, as follows:

A. Section (a) of the description of the Facility in the preamble on page 1 of the Approval has been deleted and replaced with:

(a) a 1.55-hectare Class 3 anaerobic digestion facility, to process 70,000 tonnes of Biomass per year to generate 2,852 kilowatts of electricity (kW el), 3,020 kilowatts (kW therm) of thermal power, and approximately 127 normal cubic metres of biomethane per hour (produced from the biogas upgrading system), consisting of the following processes and support units:

- (i) receipt, mixing, pre-treatment and storage in storage tanks of Biomass;
- (ii) anaerobic treatment of the pre-treated and mixed Biomass;
- (iii) electricity and thermal energy generation from the combustion of biogas produced by the anaerobic treatment of the Biomass;
- (iv) production of fertilizers from the digestate produced by the anaerobic treatment of the Biomass;
- (v) production of biomethane from biogas produced by the anaerobic treatment of the Biomass; and
- (vi) underground piping to supply thermal energy generation from the combustion of biogas to an adjacent property;

B. Section (c) of the description of the Facility in the preamble on page 2 of the Approval and on page 1 of the Amended Approval (dated June 20, 2013) has been deleted and replaced with:

(c) one (1) flare, to be used as backup for the biogas fired reciprocating engine generators and/or during periods when biogas production exceeds the capacity of the reciprocating engine generators and/or during the operation of the biogas upgrading system for treating the exhaust gas from the multi-stage polymer membrane system. The flare operates at a maximum biogas firing rate of 1500 cubic metres of biogas per hour, discharging to the air at a maximum volumetric flow rate of 6.92 cubic metres per second, through a stack with an exit diameter of 0.76 metre, extending 8 metres above grade;

C. Section (d) of the description of the Facility in the preamble on page 2 of the Approval has

been deleted and replaced with:

(d) one (1) Biofilter, consisting of two integrated modular tanks operating in parallel, to treat air from the processing building (including the biomass receiving area, solid digestate loading, processing area and contraries storage), local fume hoods in the processing areas (including the separator, digestate storage, kitchen waste hopper, grinder, contraries and truck loading area), and storage tanks. Each modular biofilter tank has dimensions of 15.2 metres by 3.4 metres with a depth of 1.83 metres of inorganic media, complete with humidification system and media surface irrigation system. The Biofilter operates with an empty bed residence time of 49 seconds and discharges to the air at a total volumetric flow rate of 3.86 cubic metres per second through a common stack, having an exit diameter of 0.54 metre, extending 14 metres above the roof and 28 metres above grade;

D. The description below Section (e) of the description of the Facility in the preamble on page 2 has been deleted and replaced with the following:

all in accordance with the application for a Renewable Energy Approval dated February 3, 2011, and signed by D. Charles Martin, President, Woolwich Bio-En Inc., and all supporting documentation including amended documentation submitted with the Application.

E. The following equipment has been added to the Approval and Section (f) has been added to the description of the Facility:

(f) one (1) biogas upgrading system, to be used for the production of biomethane from biogas, equipped with an activated carbon unit for pre-treatment and removal of hydrogen sulphide from biogas, a condenser and filtration section for preconditioning and removal of water and particles from biogas, a drying system and a multi-stage polymer membrane system for permeability separation and removal of impurities from biogas. The carbon dioxide-rich stream from the biogas upgrading system is directed to the existing flare;

F. The definitions of "Application", "Noise Report", and "Publication NPC-205" in the Approval are deleted and replaced by the following:

7. "Application" means the application for a Renewable Energy Approval dated February 3, 2011, and signed by D. Charles Martin, President, Woolwich Bio-En Inc., and all supporting documentation submitted with the application, including amended documentation submitted up to February 27, 2012; and as further amended by the amendment application dated March 1, 2013 and signed by D. Charles Martin, President, Woolwich Bio-En Inc., and all supporting documentation submitted with the Application, including amended documentation submitted up to June 20, 2013; and as further amended by the amendment application dated February 6, 2015 and signed by D. Charles Martin, President, Woolwich Bio-En Inc., and all supporting documentation submitted with the application, including amended documentation submitted up to December 7, 2015;

30. "Acoustic Assessment Report" means the report included in the amendment Application and entitled "Acoustic Assessment Report" prepared by GDH Limited, dated September 10, 2015 and signed by John Ferguson and D. Charles Martin;

43. "Publication NPC-300" means the Ministry Publication NPC-300, "Environmental Noise Guideline, Stationary and Transportation Sources – Approval and Planning, Publication NPC-300", August, 2013, as amended.

G. The definition of "Untreated Cereal Grain Seed" and "Dioxin(s) and Furan(s)" are added to the definitions section of the Approval:

57. "Untreated Cereal Grain Seed" means cereal grain seed which has not been treated with Thiamethoxam and Imidacloprid-1, and may include cereal grain seed that is not treated with other pesticides and/or fungicides;

58. "Dioxin(s) and Furan(s)" means TCDD Toxicity Equivalents (TEQ), calculated according to Schedule "D", which is attached to and forms part of this Approval and is based on high resolution and analysis of the tetrachlorinated through octachlorinated isomers of Dioxins and Furans.

H. Conditions 32, 33, 34, 35, 36, and 37 have been deleted.

I. Condition 38 of the Approval has been deleted and replaced with the following:

38. The Company shall ensure that the noise emissions from the Facility comply with the sound level limits set in Publication NPC-300.

J. Condition 41 of the Approval has been deleted and replaced with the following:

41. The Company shall carry out an Acoustic Audit in accordance with the procedures set out in Publication NPC-103, and shall submit to the District Manager and the Director an Acoustic Audit Report prepared by an Independent Acoustical Consultant in accordance with the requirements of Publication NPC-233, no later than three (3) months after the date of this amendment.

K. Condition 44(1) of the Approval has been deleted and replaced with the following:

44. (1) Within thirty (30) days after the date of this Approval, the Company shall submit to the Director, a Financial Assurance, as defined in Section 131 of the Act, for the amount of \$256,289.00. This financial assurance shall be in a form acceptable to the Director and shall provide sufficient funds for the transportation, Facility clean-up, and disposal, of all quantities of waste at the Facility at any one time. No Biomass shall be received at the Facility unless the Financial Assurance has been submitted to the Ministry and accepted by the Director.

L. Condition 46 (2) of the Approval has been deleted and replaced with the following:

46. (2) The operation of this Facility is limited to receipt and processing of the following types of Biomass:

Organic waste from food processing facilities, grocery stores, food distribution companies, bakeries, confectionary processing facilities, dairies and facilities that process dairy products, fruit and vegetable processing facilities, cereal and grain processing facilities, oil seed processing facilities, snack food processing facilities, snack food manufacturing facilities, breweries and distillers grain, wineries, alcoholic and non-alcoholic beverage manufacturing facilities, fruit and vegetable packing facilities, milling facilities, kitchen organic material, livestock, aquaculture, and paunch manure, glycerol and by-products from ethanol, biodiesel, breweries and distillery plants, FOG, renewable energy crops (i.e., corn silage), herbaceous plant material from greenhouse, nurseries, garden centers & flower shops, and aquatic plants, DAF, spent grain soluble (SGS) from ethanol, breweries and distillers plant, SSO, pulp and paper industry waste, pet food waste, compost material and uncured compost, mushroom farming waste, grain elevator, grain storage, flour and feed milling waste, algae, crop residue, Untreated Cereal Grain Seed, root crop, organic by-products of medical marijuana plant growth, and biomass as defined in Ontario Regulation 160/99, including sewage biosolids and hauled sewage.

The Biomass may be received in liquid state or solid state of varying composition of the following categories:

(a) Category "A" Biomass - comprised of mainly lipids and proteins that have an acidic pH and a complex molecular structure;

(b) Category "B" Biomass - comprised of heterogeneous organic waste that typically have an acidic pH and a simple molecular structure;

(c) Category "C" Biomass - comprised of organic wastes that typically have a neutral to slightly alkaline pH.

M. Condition 51 (1) of the Approval has been amended by adding the following:

51. (1) (c) Isomers of Dioxins and Furans of concern:

In addition to the requirements of Condition 51(1)(b) in the Approval, pulp and paper industry waste shall not be accepted at the Facility, if the analysis of the pulp and paper industry waste as required in Condition 51(2), determines that the concentration of Dioxins and/or Furans content exceeds 100 pg/g, dry weight (TEQ), as determined by analysis consistent with Schedule D.

(d) The Company shall provide any laboratory analyzing for Dioxins/Furans with a copy of Schedule "D" and specify in their contract, agreement or work order with that laboratory that the analysis must comply with Schedule "D".

N. Condition 51 (3) of the Approval has been deleted and replaced with the following:

51. (3) (a) The Company shall ensure that:

- i. each sample of the Biomass obtained under Condition 51(2) has been analysed for metals identified in Column 1 of Table 1, and/or isomers of Dioxins and Furans in Column 1 of Table 2 in Schedule D, of this Approval, as applicable, in accordance with the methods and frequencies specified in Condition 51(2); and
- ii. sampling and analysis of Biomass for metals is conducted in accordance with the methods specified in the Sampling and Analysis Protocol for O. Reg. 267/03.

(b) The Company shall ensure a copy of the analysis sets out the concentration of metals in each sample of the Biomass in:

- i. milligrams of metal per kilogram of total solids, dry weight, in case of the analysis of metals in materials that have a concentration of total solids of 10,000 milligrams or more per litre;
- ii. milligrams of metal per litre, in the case of the analysis of regulated metals in materials that have a concentration of total solids of less than 10,000 milligrams per litre.

(c) The Company shall ensure a copy of the analysis sets out the concentration of Dioxins and Furans in each sample of the Biomass in picogram per gram (pg/g), dry weight Toxic Equivalent Quantity (TEQ).

O. Schedule D has been added to the Approval as follows:

SCHEDULE "D"

Calculation of TCDD Toxicity Equivalents

In order to calculate the 2, 3, 7, 8 - tetrachlorodibenzo-p-dioxin Toxicity Equivalents (TCDD TEQ) values the following assumptions are made:

1. The concentration of 2, 3, 7, 8 - substituted isomers in each isomer group is obtained by GC HR/MS or in the absence of isomer - specific analytical data, it is assumed that all isomers in the total isomer group data as reported are all 2, 3, 7, 8-substituted. This recommendation is made since paper mill Biosolids are predominantly TCDD and TCDF;
2. The resulting data is multiplied by the appropriate international toxicity equivalency (I-TEF) (column 4 in Table 2 below) to give the appropriate TEQ, and,
3. The detection limit must be < 5 ppt.
4. When an analytical result is reported as below the detection limit, one half of the detection limit is used as the basis of the TEQ calculation.
5. Method E3151B or USEPA1613, or an equivalent approved by the Director, must be used.

Example of Toxic Equivalence Calculation:

TABLE 2

Column 1	Column 2	Column 3	Column 4	Column 5
Compound	Conc.	EDL	TEF	TE /cong
	pg/L	pg/L	pg/L	pg/L
2,3,7,8-TCDD	ND	1.1	1	0.55
1,2,3,7,8-PeCDD	ND	1	0.5	0.25
1,2,3,4,7,8-HxCDD	ND	1.2	0.1	0.06
1,2,3,6,7,8-HxCDD	ND	0.89	0.1	0.045
1,2,3,7,8,9-HxCDD	ND	1	0.1	0.05
1,2,3,4,6,7,8-HpCDD	ND	1.1	0.01	0.005
OCDD	3.4		0.001	0.003
2,3,7,8-TCDF	ND	1	0.1	0.05

1,2,3,7,8-PeCDF	ND	1	0.05	0.025
2,3,4,7,8-PeCDF	ND	1	0.5	0.25
1,2,3,4,7,8-HxCDF	ND	0.82	0.1	0.041
1,2,3,6,7,8-HxCDF	ND	1.1	0.1	0.055
2,3,4,6,7,8-HxCDF	ND	1.1	0.1	0.055
1,2,3,7,8,9-HxCDF	ND	1.2	0.1	0.06
1,2,3,4,6,7,8-HpCDF	ND	0.95	0.01	0.004
1,2,3,4,7,8,9-HpCDF	ND	1	0.01	0.005
OCDF	1.8		0.001	0.0018
	TOTAL TEQ	2,3,7,8-TCDD	(0.5 DL)	= 1.5 pg/L

TEQ = Toxic Equivalent Quantity = sum of individual TE/congener
EDL = Estimated Detection Limit
TEF = Toxic Equivalent Factor
TE/congener = Toxic Equivalence / congener

The reason(s) for this amendment to the Approval conditions are as follows:

1. Conditions 32, 33, 34, 35, 36, and 37 have been deleted from the Approval as these source testing conditions have been fulfilled.
- 2.
3. Condition 44(1) has been deleted and replaced to reflect changes to the Financial Assurance in accordance with Condition 44(2) .

This Notice shall constitute part of the approval issued under Approval No. 6428-8LGLBH dated March 26, 2012

In accordance with Section 139 of the Environmental Protection Act , within 15 days after the service of this notice, you may by further written notice served upon the Director, the Environmental Review Tribunal and the Environmental Commissioner, require a hearing by the Tribunal.

In accordance with Section 47 of the Environmental Bill of Rights, 1993 , the Environmental Commissioner will place notice of your request for a hearing on the Environmental Registry.

Section 142 of the Environmental Protection Act provides that the notice requiring the hearing shall state:

1. The portions of the renewable energy approval or each term or condition in the renewable energy approval in respect of which the hearing is required, and;
2. The grounds on which you intend to rely at the hearing in relation to each portion appealed.

The signed and dated notice requiring the hearing should also include:

3. The name of the appellant;
4. The address of the appellant;
5. The renewable energy approval number;
6. The date of the renewable energy approval;
7. The name of the Director;
8. The municipality or municipalities within which the project is to be engaged in;

This notice must be served upon:

The Secretary* Environmental Review Tribunal 655 Bay Street, 15th Floor Toronto, Ontario M5G 1E5	AND	The Environmental Commissioner 1075 Bay Street, 6th Floor Suite 605 Toronto, Ontario M5S 2B1	AND	The Director Section 47.5, <i>Environmental Protection Act</i> Ministry of the Environment and Climate Change 135 St. Clair Avenue West, 1st Floor Toronto, Ontario M4V 1P5
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*** Further information on the Environmental Review Tribunal's requirements for an appeal can be obtained directly from the Tribunal at: Tel: (416) 212-6349, Fax: (416) 326-5370 or www.ert.gov.on.ca**

Under Section 142.1 of the Environmental Protection Act , residents of Ontario may require a hearing by the Environmental Review Tribunal within 15 days after the day on which notice of this decision is published in the Environmental Registry. By accessing the Environmental Registry at www.ebr.gov.on.ca , you can determine when this period ends.

Approval for the above noted renewable energy project is issued to you under Section 47.5 of the Environmental Protection Act subject to the terms and conditions outlined above.

DATED AT TORONTO this 7th day of December,
2015

Mohsen Keyvani, P.Eng.
Director
Section 47.5, *Environmental Protection
Act*

RA/
c: District Manager, MOECC Guelph
John Ferguson, Conestoga-Rovers and Associates