Commonwealth of Massachusetts
Executive Office of Energy & Environmental Affairs

# Department of Environmental Protection

DEVAL L. PATRICK
Governor

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Secretary

KENNETH L. KIMMELL
Commissioner

Date Stamped January 13, 2014

Mr. Louis Aragi, Jr.
Pine Island Farm
1474 Hewins Street
Sheffield, MA 02157

**RE: SHEFFIELD**
Transmittal No.: X255959
Application No.: NE-13-019
Class: *SM-25*
FMF No.: 512696
**AIR QUALITY PLAN APPROVAL**

Dear Mr. Aragi, Jr.:

The Massachusetts Department of Environmental Protection ("MassDEP"), Bureau of Waste Prevention, has reviewed your Non-major Comprehensive Plan Application ("Application") listed above. This Application concerns the proposed installation of a second 225 kilowatt (kw) engine/generator set at Pine Island Farm located at 1474 Hewins Street, Sheffield, Massachusetts ("Facility"). The Application bears the seal and signature of Mr. James Gagnon, Massachusetts Registered Professional Engineer number 29550.

This Application was submitted in accordance with 310 CMR 7.02 Plan Approval and Emission Limitations as contained in 310 CMR 7.00 "Air Pollution Control," regulations adopted by MassDEP pursuant to the authority granted by Massachusetts General Laws, Chapter 111, Section 142 A-J, Chapter 21C, Section 4 and 6, and Chapter 21E, Section 6. MassDEP's review of your Application has been limited to air pollution control regulation compliance and does not relieve you of the obligation to comply with any other regulatory requirements.

MassDEP has determined that the Application is administratively and technically complete and that the Application is in conformance with the Air Pollution Control regulations and current air pollution control engineering practice, and hereby grants this **Plan Approval** for said Application, as submitted, subject to the conditions listed below.

Please review the entire Plan Approval, as it stipulates the conditions with which the Facility owner/operator ("Permittee") must comply in order for the Facility to be operated in compliance with this Plan Approval.

# 1. DESCRIPTION OF FACILITY AND APPLICATION

Pine Island Farm is located in Sheffield, Massachusetts. The farm has approximately 700 milking cows which produce raw milk for wholesale distribution. The farm also includes 134 acres of land which produces corn crops. These fields are currently fertilized with the liquid digestate that is produced by the on-site anaerobic digestion system and that is stored in an open top SlurryStone storage tank.

The owner/operator of Pine Island Farm ("Permittee") has installed an anaerobic digestion/biogas-to-energy system that generates biogas which in turn is used to produce electricity and heat via a combined heat and power lean burn engine/generator set. The heat is used by Pine Island Farm while the electricity is used by the farm as well as provided to the electric grid.

The anaerobic digestion/biogas-to-energy system consists of the following process equipment: a Reception Pit, two 20,000 gallon enclosed, above ground storage tanks, a Digester Tank, a Dewatering System, an open top SlurryStone Liquid Fertilizer Storage Tank, a 225 kilowatt (kw) lean burn engine/generator set, and a back-up utility flare. The system utilizes in-house cow manure, as well as occasional shipments of off-site generated cow manure, and dairy products from off-site sources, such as off-specification milk and cheese whey, to produce the biogas.

All of this equipment was approved by MassDEP via Air Quality Plan Approval, MBR-10-COM-005, dated October 14, 2010. The Permittee is proposing to install an additional 225 kw engine/generator set and a new hydrogen sulfide scrubber. The Permittee is also proposing to use Source Separated Organic (SSO) materials that will be delivered to Pine Island Farm as liquid slurry in the anaerobic digestion system.

## Reception Pit

Unprocessed in-house cow manure from approximately 700 milking cows will continue to be collected from the dairy barns and milking parlor holding area and will continue to be deposited in an existing, 32,000 gallon concrete reception pit, which is designated as Emission Unit No. 3 (EU3). Several times per day, manure will pushed from the barns and holding area into the reception pit using a small "bob-cat" like mechanical device. Milking parlor wastewater will also discharge through piping into this reception pit.

The existing reception pit is an open-top, subsurface concrete structure with dimensions of 20-feet by 27-feet by 6-feet (32,200 gallon storage capacity, or approximately 2-days manure storage). The manure in the reception pit is maintained in uniform consistency using an existing 20 horsepower (hp) mixer.

The manure will continue to be pumped from the reception pit to the digester using an existing piston pump. The pump is located below ground in a concrete pump room.

**Above Ground Storage Tanks**

The Permittee currently uses two 20,000 gallon, enclosed, above ground storage tanks (EU4A and EU4B) to store deliveries of off-specification dairy products. This material is discharged to EU3 through a dip pipe. In the future, EU4A and EU4B may contain SSO material which will also be delivered to the facility as liquid slurry. Air in the headspace of EU4A and EU4B shall pass through two (2) activated carbon drums in series to remove potential odors as the headspace air is displaced during filling operations. Sniff tube sampling ports shall be located at the inlet and outlet of each carbon drum. Initially, when the carbon media in both drums is brand new, the two drums will have similar odorous compounds concentrations. After the first drum has become saturated, it is removed and the second drum becomes the primary odor control device; a fresh second activated carbon drum is then added, and the odor monitoring process is repeated. (See Special Terms and Conditions No. 8.)

**Digester Tank**

The anaerobic digester vessel (EU5) is a concrete structure with approximate dimensions of 75-feet by 76-feet by 16-feet high and will have a working volume of approximately 600,000 gallons. EU5 has approximately 22- to 27-days hydraulic retention time. It has a concrete cover and is partially below-ground with an above ground exposure of approximately 10-feet. During the first phase of digestion, the raw manure is heated to a temperature of 100 degrees Fahrenheit ($^{o}$F) using reclaimed waste heat from the electrical co-generation system. This temperature is the optimum growth temperature of the methanogenic bacteria. The first section of EU5 is designed to facilitate the growth of acid forming bacteria. These acid forming bacteria break down the complex organic waste material found in the raw manure into simpler volatile fatty acids and acetic acid. The material flows by gravity into the second stage of EU5.

The second stage of the digester vessel is the largest stage, due to the slower growth rate of the methanogenic bacteria. The methanogenic bacteria convert the volatile fatty acids and acetic acid produced in the first stage into biogas, which consists primarily of methane and carbon dioxide. Reclaimed waste heat from the electrical co-generation system is used to maintain the optimum 100 $^{o}$F temperature.

The methane rich (approximately 58 percent (%)) biogas will be collected from the first two stages of the digester vessel and is utilized for fuel in the existing and proposed combined heat and power engine/generator sets (gensets). The expected generation rate for bio-gas is approximately 180,000 cubic feet per day, which will be sufficient to fuel both engines at approximately 80% load. The gensets will be located in a closed building with approximate dimensions of 100 feet (') x 50' x 28' high. A portion of this building will continue to be used for solids processing and storage. Each 338 horsepower engine is capable of producing 225 kw of electricity per hour. The electricity will be sold to the electric grid and utilized on the farm. Hot water recovered from the engine cooling systems and exhausts will be utilized to heat the digester and for other farm heating needs.

The Permittee will install a new BioScrub packed bed scrubber, hydrogen sulfide ($H_2S$) removal system to condition the biogas prior to combustion in either of the two engines. The BioScrub system utilizes oxygen (from introduced air) and a nutrient rich recirculating liquid in a counter current packed bed scrubber. The scrubber liquid, now containing sulfur, will be transferred to the 4,000,000 gallon Slurrystone storage tank (EU6) where it will be added to digester liquids and other liquid streams from dairy operations.

The BioScrub media consists of low pressure drop, "Hiflow-Rings" plastic packing that will be supported by a fiberglass floor. Recirculation pumps periodically recycle nutrient containing fluid from the scrubber base to spray over the media pack. Pressure drop through the scrubber tank will be 2 – 3 inches of water column. Water is used to buffer recycle fluid and wash out sulfur and sulfuric acid produced by the bacteria. Average make-up water use is 1 – 2 gallons per minute. Outlet $H_2S$ concentrations will be monitored and recorded twice per hour at the outlet of the scrubber along with the biogas parameters of carbon dioxide, oxygen, and methane content.

Demonstrated BioScrub removal efficiency for $H_2S$ is typically in the range of 94 – 99 percent by weight/volume. The anticipated maximum, uncontrolled $H_2S$ concentration entering the BioScrub scrubber is 2,000 parts per million by volume ($ppm_v$). To achieve the required maximum 200 $ppm_v$ inlet concentration to the engine, a minimum $H_2S$ removal efficiency of 90% will be required, which is consistent with the removal efficiency achieved in practice.

**De-watering System and SlurryStone Liquid Storage Tank**

After the second stage of the anaerobic digester (EU5), the treated waste is gravity fed into an effluent collection pit during which the materials are further processed. Approximately 10% of the solids, rich in methanogenic bacteria, are recycled from the end of the second stage to the beginning of the second stage of EU5 as seed stock for the methanogenic bacteria process. The remaining 90% of the solids is pumped from the effluent pit to the manure solids separator (screw press) for dewatering. Solids exit the screw press with a solids content of approximately 35%. At this water content, the material is suitable for use as animal bedding.

The separated solids digestate is stored in the new building and is used on Pine Island Farm as bedding, or is utilized offsite as bedding or as a soil enhancer. Liquid digestate exiting the digester and the screw press is pumped to and stored in EU6; where it will be used as fertilizer on fields in the spring and fall.

**Engines and Back-up Utility Flare**

Biogas from EU5 will continue to serve as fuel for the existing (EU1A) as well as the new Guascor Model No. SFGLD 180 engine genset (EU1B). The biogas contains approximately 580 British thermal units per standard cubic foot (Btu/scf) of gas. The methane concentration in the biogas is expected to be approximately 58% by volume. An on-site shrouded utility flare will combust the biogas whenever necessary, such as when an engine is down due to maintenance or repairs.

Each Guascor Model No. SFGLD 180 engine will have a maximum heat input capacity of 2,180,000 British thermal units per hour (Btu/hr). Each engine is capable of combusting up to 62 standard cubic feet per minute (scfm) of digester gas at 100% load. Each engine will be equipped with an 8-inch diameter, vertical stack. The opening of each vertical stack shall be situated 5 feet above the building roof and 33 feet above ground level. The exhaust gas exit velocity from each engine will range from 23 to 53 feet per second at a stack gas temperature of approximately 350 degrees Fahrenheit ($^{o}$F).

The existing LFG Specialties, LLC Model CFT32013 utility flare with shroud (EU2), has a maximum heat input capacity of 7,000,000 Btu/hr. This back-up flare is capable of combusting up to 200 scfm of digester gas with a turndown ration of 10:1. The flare is equipped with a 10-inch diameter vertical exhaust, the top of which is situated 33 feet above ground level. The exhaust gas exit velocity from the flare will range from 7 to 68 feet per second at a stack gas temperature of approximately 1,500 $^{o}$F.

## 2. EMISSION UNIT (EU) IDENTIFICATION

Each Emission Unit (EU) identified in Table 1 is subject to and regulated by this Plan Approval:

**Table 1**

| EU# | Description | Design Capacity | Pollution Control Device (PCD) |
|---|---|---|---|
| EU1A | Existing Guascor Model No. SFGLD-180 engine | 2.18 MMBtu/hr<br>225 kw max output | Fuel Injection modification; turbocharging |
| EU1B | New Guascor Model No. SFGLD-180 engine | 2.18 MMBtu/hr<br>225 kw max output | Fuel Injection modification; turbocharging |

| Table 1 | | | |
|---|---|---|---|
| **EU#** | **Description** | **Design Capacity** | **Pollution Control Device (PCD)** |
| EU2 | Existing LFG Specialties Model CFT32013 utility flare with shroud | 7.0 MMBtu/hr | None |
| EU3 | Existing Open Reception Pit | 32,000 gallons | |
| EU4A<br>EU4B | Two Existing Above Ground Storage Tanks | 20,000 gallons each | Two Activated Carbon drums in series |
| EU5 | Existing GHD Digester Tank | 600,000 gallons | BioScrub $H_2S$ Scrubber |
| EU6 | Existing SlurryStone Storage Tank | 4,000,000 gallons | None |

**Table 1 Key:**
EU# = Emission Unit Number
max = maximum
$H_2S$ = Hydrogen Sulfide
MMBtu/hr = million British thermal units per hour
kw = kilowatt

# 3. APPLICABLE REQUIREMENTS

## A. OPERATIONAL, PRODUCTION and EMISSION LIMITS

The Permittee is subject to, and shall not exceed the Operational, Production, and Emission Limits as contained in Table 2 below:

| Table 2 | | | |
|---|---|---|---|
| **EU#** | **Operational / Production Limit** | **Air Contaminant** | **Emission Limit** |
| EU1A & EU1B[a] | NA | $NO_x$ | 2.0 lbs/MW-hr; 0.34 TPM; 4.0 TPY |
| | | CO | 6.0 lbs/MW-hr; 1.0 TPM; 11.8 TPY |
| | | VOC | 2.4 lbs/MW-hr; 0.4 TPM; 4.6 TPY |
| | | $PM/PM_{10}/PM_{2.5}$ | 0.3 lb/MW-hr; 0.05 TPM; 0.6 TPY |
| | | $SO_2$ [b] | 0.6 lb/MW-hr; 0.1 TPM; 1.2 TPY |
| | Daily average of $H_2S$ shall be less than or equal to 200 $ppm_v$ [b] | $H_2S$ [b] | NA |
| | NA | $CO_2$ | 2110 lbs/MW-hr; 345 TPM; 4141 TPY |
| | | Opacity | <5%, except 5 to <10% for ≤2 minutes during any one hour |
| | | Smoke | 310 CMR 7.06(1)(a) |

| Table 2 | | | |
|---|---|---|---|
| **EU#** | **Operational / Production Limit** | **Air Contaminant** | **Emission Limit** |
| EU2 | Maximum consumption of 10,512,000 cubic feet of digester gas over any consecutive twelve month rolling period and 3,504,000 cubic feet of digester gas per month | $NO_x$ | 0.48 lb/hr; 0.07 TPM; 0.21 TPY |
| | | CO | 2.6 lbs/hr; 0.38 TPM; 1.13 TPY |
| | | VOC | 1.0 lbs/hr; 0.14 TPM; 0.43 TPY |
| | | $PM/PM_{10}/PM_{2.5}$ | 0.07 lb/hr; 0.01 TPM; 0.03 TPY |
| | | $SO_2$ [c] | 4.0 lb/hr; 0.59 TPM; 1.75 TPY |
| | | $CO_2$ | 1515 lbs/hr; 221 TPM; 664 TPY |
| | Maximum $H_2S$ concentration of digester gas from EU5 to EU2 shall be less than or equal to 2000 $ppm_v$ [c] | $H_2S$ [c] | NA |
| | NA | Opacity | <5%, except 5 to <10% for ≤2 minutes during any one hour |
| | | Smoke | 310 CMR 7.06(1)(a) |
| Facility-wide | NA | $NO_x$ | 0.41 TPM; 4.21 TPY |
| | | CO | 1.1 TPM; 12.93 TPY |
| | | VOC | 0.54 TPM; 5.03 TPY |
| | | $PM/PM_{10}/PM_{2.5}$ | 0.06 TPM; 0.63 TPY |
| | | $SO_2$ | 0.69 TPM; 2.95 TPY |
| | | $H_2S$ | NA |
| | | $CO_2$ | 566 TPM; 4805 TPY |

**Table 2 Key:**
EU# = Emission Unit Number
NA = not applicable
$NO_x$ = Nitrogen Oxides
CO = Carbon Monoxide
$SO_2$ = Sulfur Dioxide
PM = Total Particulate Matter
$PM_{10}$ = Particulate Matter less than or equal to 10 microns in diameter
$PM_{2.5}$ = Particulate Matter less than or equal to 2.5 microns in diameter
VOC = Volatile Organic Compounds
$H_2S$ = Hydrogen Sulfide
Single HAP = maximum single Hazardous Air Pollutant
Total HAPs = total Hazardous Air Pollutants.
$CO_2$ = Carbon Dioxide
$ppm_v$ = part per million by volume
lbs/hr = pounds per hour
lbs/MW-hr = pounds per megawatt hour output
TPM = tons per month

TPY = tons per consecutive12-month period

[a] = These emission limitations shall apply at all engine/generator loads. Hourly emission limits are per engine while monthly and twelve month rolling emission limits are totals for both engines.

Compliance with these emission limitations shall be determined based on hourly averages

These emission limits are based upon biogas containing 580 British thermal units per standard cubic foot.

[b] = $H_2S$ emissions are regulated by restricting the inlet $H_2S$ concentrations to the engine to less than or equal to 200 $ppm_v$. $SO_2$ emissions are based upon 99.5 percent oxidation of the inlet $H_2S$ concentrations to the engine.

[c] = maximum uncontrolled, daily $H_2S$ concentration from the digester to the flare will be less than or equal to 2000 $ppm_v$. $SO_2$ emissions are based upon 99.5 percent oxidation of the inlet $H_2S$ concentrations to the flare.

## B. COMPLIANCE DEMONSTRATION

The Permittee is subject to, and shall comply with, the monitoring, testing, record keeping, and reporting requirements as contained in Tables 3, 4, and 5 below:

**Table 3**

| EU# | Monitoring and Testing Requirements |
|---|---|
| EU1A<br>EU1B | 1. The Permittee shall conduct a noise survey (during daytime and nighttime operation), which is in accordance with MassDEP guidelines, to demonstrate that the noise impacts from the operation of EU1A and EU1B are in compliance with Regulation 310 CMR 7.10 and the Bureau of Waste Prevention's Noise Policy No. 90-001 (copy attached). This survey shall be conducted within 45 days of the commencement of continuous operation of these EUs. The noise survey results shall be submitted to MassDEP's Northeast Regional Office (NERO), in writing, attention BWP Permit Chief, within 75 days of the commencement of continuous operation of these EUs. |
| EU1B | 2. The Permittee shall conduct emissions testing for $NO_x$, CO, $H_2S$, VOC, $SO_2$, and $CO_2$ on this EU within 90 days of the commencement of its continuous operation. All compliance testing shall be conducted in accordance with the test methods and procedures set forth in 40 CFR 60, Appendix A. All compliance testing shall be witnessed by MassDEP personnel at a mutually agreeable date and time. The Permittee shall submit a test protocol for the required emission test for review and MassDEP approval at least 60 days prior to the anticipated date of testing. The Permittee shall submit the emission test results report to MassDEP's NERO within 60 days of completion of the compliance stack testing. |
| | 3. For compliance testing purposes, this EU shall be constructed so as to accommodate the emissions testing requirements as stipulated in 40 CFR Part 60, Appendix A. The two (2) inlet and two (2) outlet sampling ports should ideally be located at two duct diameters upstream and eight duct diameters downstream of any flow disturbance. The corresponding sampling ports should be 90 degrees apart from each other. |
| EU1A<br>EU1B<br>EU2 | 4. The Permittee shall monitor the daily, monthly, and twelve month rolling biogas consumption and/or electrical output for each EU to document compliance status with the emission limitations contained in Table 2 above. |
| EU1A<br>EU1B<br>EU5 | 5. The Permittee shall monitor daily the maximum and minimum hydrogen sulfide concentrations (in ppm by volume) exiting EU5 before the biogas is combusted in either EU1A or EU1B to document compliance status with the emission limitations contained in Table 2 above. |

| Table 3 | |
|---|---|
| **EU#** | **Monitoring and Testing Requirements** |
| EU2 | 6. The Permittee shall monitor weekly the hydrogen sulfide concentrations (in ppm by volume) exiting EU5 before the biogas is combusted in EU2 to document compliance status with the emission limitations contained in Table 2 above. |
| EU4A<br>EU4B | 7. The Permittee shall monitor daily the amount of SSO that EU4A and EU4B receives. |
| | 8. The Permittee personnel shall be trained in the proper operation of the activated carbon system for EU4A and EU4B. |
| | 9. The Permittee shall monitor the two activated carbon drums in series for breakthrough weekly. When breakthrough has occurred, the Permittee shall install a new activated carbon drum with the remaining secondary drum becoming the primary drum in the control train to ensure proper odor control. |
| EU5 | 10. The Permittee shall monitor the oxygen ($O_2$) content weekly in EU5 to document compliance status with Special Terms and Conditions No. 3. |
| Facility-wide | 11. The Permittee shall conduct additional emissions testing on the subject units if and when MassDEP deems it necessary as per 310 CMR 7.13 – Stack Testing. All emissions testing shall be performed in accordance with USEPA Reference Test Methods and regulation 310 CMR 7.13. |

**Table 3 Key:**
EU# = Emission Unit Number
SSO = source separated organics (i.e. food waste)
$O_2$ = Oxygen
$NO_x$ = Nitrogen Oxides
CO = Carbon Monoxide
$SO_2$ = Sulfur Dioxide
VOC = Volatile Organic Compounds
$H_2S$ = Hydrogen Sulfide
$CO_2$ = Carbon Dioxide

| Table 4 | |
|---|---|
| **EU#** | **Record Keeping Requirements** |
| EU1A<br>EU1B<br>EU2<br>EU3<br>EU4A<br>EU4B<br>EU5 | 1. The Permittee shall quantify all periods of excess emissions, even if attributable to an emergency/malfunction, startup/shutdown or equipment cleaning in the determination of annual emissions and compliance with the emission limits as stated in Table 2. |
| | 2. The Permittee shall maintain a record keeping system for these EUs to be established on-site. All such records shall be maintained up-to-date such that year-to-date information is readily available for MassDEP examination upon request and shall be kept on site for a minimum of five (5) years. Record keeping shall, at a minimum, include:<br>a) Compliance records sufficient to document that the actual monthly and twelve month rolling emission rates of $NO_x$, CO, VOC, total PM, $SO_2$, $H_2S$, and $CO_2$ from each EU are in compliance with the emission limitations contained in Table 2 above. Such records shall include, but are not limited to, the daily, monthly, and twelve month rolling biogas consumption rates for each applicable EU, emissions test results, monitoring equipment data and reports, and hours of operation.<br>b) Maintenance: A record of routine maintenance activities performed on these EUs and their monitoring equipment including, at a minimum, the type or a description of the maintenance performed and the date and time the work was completed.<br>c) Malfunctions: A record of all malfunctions of these EUs and their monitoring equipment including, at a minimum: the date and time the malfunction occurred; a description of the malfunction and the corrective action taken; the date and time corrective actions were initiated; and the date and time corrective actions were completed and the equipment was returned to compliance. |
| | 3. The Permittee shall maintain a copy of all noise survey results on-site. |
| EU1A<br>EU1B<br>EU5 | 4. The Permittee shall maintain daily on-site records of the maximum, minimum, and average hydrogen sulfide concentrations (in ppm by volume) exiting EU5 before the biogas is combusted in either EU1A or EU1B to document compliance with the emission limitations contained in Table 2 above. |
| EU2 | 5. The Permittee shall maintain weekly on-site records of the hydrogen sulfide concentrations (in ppm by volume) exiting EU5 before the biogas is combusted in EU2 to document compliance with the emission limitations contained in Table 2 above. |
| EU4A<br>EU4B | 6. The Permittee shall maintain daily records on-site of the amount of SSO that EU4A and EU4B receives. |
| | 7. The Permittee personnel shall record the date, time, and delivery amount of SSO as well as sign off that the activated carbon system for EU4A and EU4B was utilized properly prior to feeding the SSO to EU4A or EU4B. This information shall be recorded in a logbook, or similar record keeping system, that shall be maintained near EU4A and EU4B. |
| | 8. The Permittee shall maintain weekly records on-site on the condition of the activated carbon system and replace the activated carbon when breakthrough has occurred. |
| EU5 | 9. The Permittee shall maintain weekly records on-site on the oxygen ($O_2$) content in EU5. |

| Table 4 | |
|---|---|
| **EU#** | **Record Keeping Requirements** |
| Facility-wide | 10. The Permittee shall maintain adequate records on-site to demonstrate compliance status with all operational, production, and emission limits contained in Table 2 above. Records shall also include the actual emissions of air contaminant(s) emitted for each calendar month and for each consecutive twelve month period (current month plus prior eleven months). These records shall be compiled no later than the 15th day following each month. An electronic version of the MassDEP approved record keeping form, in Microsoft Excel format, can be downloaded at http://www.mass.gov/dep/air/approvals/aqforms.htm#report . |
| | 11. The Permittee shall maintain records of monitoring and testing as required by Table 3. |
| | 12. The Permittee shall maintain a copy of this Plan Approval, underlying Application and the most up-to-date SOMP for the EU(s) and PCDs approved herein on-site. |
| | 13. The Permittee shall maintain records required by this Plan Approval on-site for a minimum of five (5) years. |
| | 14. The Permittee shall make records required by this Plan Approval available to MassDEP and USEPA personnel upon request. |

**Table 4 Key:**
EU# = Emission Unit Number
PCDs = Pollution Control Devices
SOMP = Standard Operating and Maintenance Procedure
USEPA = United States Environmental Protection Agency

| Table 5 | |
|---|---|
| **EU#** | **Reporting Requirements** |
| EU1B | 1. The Permittee shall submit a compliance test protocol for the required initial compliance test to MassDEP's Northeast Regional Office (NERO) for review and approval at least 30 days prior to the scheduled commencement of said testing. Test protocols for any subsequent required emissions testing shall be submitted to MassDEP's Western Regional Office (WERO) for review and approval at least 30 days prior to the scheduled commencement of said testing. |
| | 2. The Permittee shall submit the initial emission test results report to NERO for review within 60 days of the completion of any required compliance stack testing. All subsequent emission test results reports shall be submitted to WERO. |
| | 3. The Permittee shall notify both NERO and WERO, in writing, within 14 days of commencement of continuous operation of this EU. |

| Table 5 | |
|---|---|
| **EU#** | **Reporting Requirements** |
| EU1A<br>EU1B<br>EU2<br>EU3<br>EU4A<br>EU4B<br>EU5 | 4. The noise survey results shall be submitted to NERO, in writing, attention BWP Permit Chief, within 75 days of the commencement of continuous operation of these EUs. |
| | 5. The Permittee shall submit the Final Standard Operating and Maintenance Procedures (SOMP) for these EUs to NERO within 60 days of completion of their required initial compliance testing. Any subsequent changes to the SOMP shall be submitted to WERO, within 15 days of said revision(s). |
| | 6. The Permittee shall notify MassDEP's WERO by telephone, fax, or email as soon as possible, but in any case no later than one business day, and subsequently in writing within seven days, after the occurrence of any upsets or malfunctions to these EUs and related equipment which results in an excess emission to the air and/or a condition of air pollution. |
| | 7. All notifications and reporting required and not specified by this Approval shall be made to:<br>Department of Environmental Protection/Bureau of Waste Prevention<br>436 Dwight Street<br>Springfield, Massachusetts 01103<br>ATTN: BWP Permit Chief<br>Phone: 413-784-1100<br>Fax: 413-784-1149 |
| EU1A<br>EU1B<br>EU2<br>EU5 | 8. The Permittee shall notify MassDEP's WERO, ATTN: BWP Permit Chief, within three (3) business days by fax at (413) 784-1149 of any exceedances of the $H_2S$ emission limit found in Tables 2 above. In the same manner, the Permittee shall notify MassDEP whenever the $H_2S$ gas monitoring probe is offline and again when it is back on-line. |
| Facility-wide | 9. The Permittee shall submit to MassDEP all information required by this Plan Approval over the signature of a "Responsible Official" as defined in 310 CMR 7.00 and shall include the Certification statement as provided in 310 CMR 7.01(2)(c). |
| | 10. The Permittee shall notify the Western Regional Office of MassDEP, BWP Permit Chief by telephone (413-784-1100), email, Marc.simpson@state.ma.us, or fax (413-784-1149), as soon as possible, but no later than one (1) business day after discovery of an exceedance(s) of Table 2 requirements. A written report shall be submitted to Permit Chief at MassDEP within three (3) business days thereafter and shall include: identification of exceedance(s), duration of exceedance(s), reason for the exceedance(s), corrective actions taken, and action plan to prevent future exceedance(s). |
| | 11. The Permittee shall provide a copy to MassDEP of any record required to be maintained by this Plan Approval within 30-days from MassDEP's written request. |

**Table 5 Key:**
EU# = Emission Unit Number

# 4. SPECIAL TERMS AND CONDITIONS

The Permittee is subject to, and shall comply with, the following special terms and conditions:

A. The Permittee shall comply with the Special Terms and Conditions as contained in Table 6 below:

**Table 6**

| EU# | Special Terms and Conditions |
|---|---|
| EU1A<br>EU1B | 1. Each EU shall be equipped with a critical grade silencer. In addition, the Permittee shall install acoustic noise suppression for the air intake louvers to minimize the potential of a puretone condition. |
| EU2 | 2. The Permittee shall equip the back-up flare with a shield such that there is no exposed flame as well as provide raptor protection. |
| EU5 | 3. The $O_2$ content in the cleaned biogas shall average between 0.2 and 4% by volume. |
| Facility-wide | 4. The Permittee shall operate the subject EUs consistent with the Final SOMP and the conditions/parameters established during the initial compliance test. |
| | 5. The Permittee shall perform the following actions for the purpose of controlling odors from material handling and processing:<br>i. Install and operate an activated carbon system involving two activated carbon drums in series to control emissions of odors from filtered SSO receiving operations;<br>ii. Minimize receiving Tank openings during the loading of SSO. |
| | 6. A full inventory of spare parts for the entire anaerobic digestion facility shall be kept at an offsite location for use within two hours of the facility. |
| | 7. This Plan Approval, NE-13-019, supersedes the Conditional Approval, MBR-10-COM-005, issued to the Permittee on October 14, 2010, in its entirety, with the exception that all plan application materials submitted as part of Approval MBR-10-COM-005 become part of Plan Approval No. NE-13-019. |

| Table 6 | |
|---|---|
| **EU#** | **Special Terms and Conditions** |
| Facility-wide | 8. The Permittee shall submit a standard operating and maintenance procedure for the activated carbon system as well as the BioScrub hydrogen scrubber system to MassDEP's NERO, ATTN: BWP Permit Chief within ninety (90) days of startup of EU1B. This plan shall be implemented and followed immediately upon startup of the facility and, at a minimum, include the following information:<br>i. A description of each system, including materials of construction and key operating parameter value(s) or range(s);<br>ii. A description of how each said system will be operated and maintained, including a schedule for routine maintenance and material replacement, equipment specifications of the system's odorous air blower, and dimensions and location of each system;<br>iii. A description of how each system's key operating parameters will be monitored and corrective actions performed if any key operating parameter(s) fall outside its (their) expected value(s) or range(s);<br>iv. A description of any periodic sampling or testing performed on each system and emissions exiting it for odor-causing compounds;<br>v. A description of how any system malfunctions will be reported to the MassDEP. |
| | 9. This facility may be subject to the Federal New Source Performance Standards (NSPS) for Stationary Spark Ignition Internal Combustion Engines (40 CFR Part 60 Subpart JJJJ). Since MassDEP has not accepted delegation for Subpart JJJJ, you are advised to consult with the EPA for additional information. There may be additional notification, record keeping and reporting requirements. Their address is US EPA Region 1, 5 Post Office Square – Suite 100, Boston, MA 02109-3912. |
| | 10. This facility may be subject to the Federal National Emissions Standards for Hazardous Air Pollutants (NESHAPs) for Stationary Reciprocating Internal Combustion Engines (RICE) under 40 CFR Part 63 Subpart ZZZZ. This regulation includes stationary RICE units at an area source. Since MassDEP has not accepted delegation for Subpart ZZZZ, you are advised to consult with the United States Environmental Protection Agency (USEPA) for additional information. There may be additional notification, record keeping and reporting requirements. Their address is US EPA Region 1, 5 Post Office Square – Suite 100, Boston, MA 02109-3912. |

**Table 6 Key:**
EU# = Emission Unit Number

B. The Permittee shall install and use an exhaust stack, as required in Table 7, on each of the Emission Units that is consistent with good air pollution control engineering practice and that discharges so as to not cause or contribute to a condition of air pollution. Each exhaust stack shall be configured to discharge the gases vertically and shall not be equipped with any part or device that restricts the vertical exhaust flow of the emitted gases, including but not limited to rain protection devices known as "shanty caps" and "egg beaters." The Permittee shall install and utilize exhaust stacks with the following parameters, as contained in Table 7 below, for the Emission Units that are regulated by this Plan Approval:

**Table 7**

| EU# | Stack Height Above Ground (feet) | Stack Inside Exit Dimensions (inches) | Stack Gas Exit Velocity Range (feet per second) | Stack Gas Exit Temperature Range ($^{o}$F) |
|---|---|---|---|---|
| EU1A | 33 | 8 | 22 - 53 | 350 |
| EU1B | 33 | 8 | 22 - 53 | 350 |
| EU2 | 33 | 10 | 7 - 68 | 1500 |

**Table 7 Key:**
EU# = Emission Unit Number
$^{o}$F = Degree Fahrenheit

## 5. GENERAL CONDITIONS

The Permittee is subject to, and shall comply with, the following general conditions:

A. Pursuant to 310 CMR 7.01, 7.02, 7.09 and 7.10, should any nuisance condition(s), including but not limited to smoke, dust, odor or noise, occur as the result of the operation of the Facility, then the Permittee shall immediately take appropriate steps including shutdown, if necessary, to abate said nuisance condition(s).

B. If asbestos remediation/removal will occur as a result of the approved construction, reconstruction, or alteration of this Facility, the Permittee shall ensure that all removal/remediation of asbestos shall be done in accordance with 310 CMR 7.15 in its entirety and 310 CMR 4.00.

C. If construction or demolition of an industrial, commercial or institutional building will occur as a result of the approved construction, reconstruction, or alteration of this Facility, the Permittee shall ensure that said construction or demolition shall be done in accordance with 310 CMR 7.09(2) and 310 CMR 4.00.

D. Pursuant to 310 CMR 7.01(2)(b) and 7.02(7)(b), the Permittee shall allow MassDEP and / or USEPA personnel access to the Facility, buildings, and all pertinent records for the purpose of making inspections and surveys, collecting samples, obtaining data, and reviewing records.

E. This Plan Approval does not negate the responsibility of the Permittee to comply with any other applicable Federal, State, or local regulations now or in the future.

F. Should there be any differences between the Application and this Plan Approval, the Plan Approval shall govern.

G. Pursuant to 310 CMR 7.02(3)(k), MassDEP may revoke this Plan Approval if the construction work is not commenced within two years from the date of issuance of this Plan Approval, or if the construction work is suspended for one year or more.

H. This Plan Approval may be suspended, modified, or revoked by MassDEP if MassDEP determines that any condition or part of this Plan Approval is being violated.

I. This Plan Approval may be modified or amended when in the opinion of MassDEP such is necessary or appropriate to clarify the Plan Approval conditions or after consideration of a written request by the Permittee to amend the Plan Approval conditions.

J. The Permittee shall conduct emission testing, if requested by MassDEP, in accordance with USEPA Reference Test Methods and regulation 310 CMR 7.13. If required, a pretest protocol report shall be submitted to MassDEP at least 30 days prior to emission testing and the final test results report shall be submitted within 45 days after emission testing.

K. Pursuant to 310 CMR 7.01(3) and 7.02(3)(f), the Permittee shall comply with all conditions contained in this Plan Approval. Should there be any differences between provisions contained in the General Conditions and provisions contained elsewhere in the Plan Approval, the latter shall govern.

## 6. MASSACHUSETTS ENVIRONMENTAL POLICY ACT

MassDEP has determined that the filing of an Environmental Notification Form (ENF) with the Secretary of Energy & Environmental Affairs, for air quality control purposes, was not required prior to this action by MassDEP. Notwithstanding this determination, the Massachusetts Environmental Policy Act (MEPA) and 301 CMR 11.00, Section 11.04, provide certain "Fail-Safe Provisions," which allow the Secretary to require the filing of an ENF and/or an Environmental Impact Report (EIR) at a later time.

## 7. APPEAL PROCESS

This Plan Approval is an action of MassDEP. If you are aggrieved by this action, you may request an adjudicatory hearing. A request for a hearing must be made in writing and postmarked within twenty-one (21) days of the date of issuance of this Plan Approval.

Under 310 CMR 1.01(6)(b), the request must state clearly and concisely the facts, which are the grounds for the request, and the relief sought. Additionally, the request must state why the Plan Approval is not consistent with applicable laws and regulations.

The hearing request along with a valid check payable to the Commonwealth of Massachusetts in the amount of one hundred dollars ($100.00) must be mailed to:

Commonwealth of Massachusetts
Department of Environmental Protection
P.O. Box 4062
Boston, MA 02211

This request will be dismissed if the filing fee is not paid, unless the appellant is exempt or granted a waiver as described below. The filing fee is not required if the appellant is a city or town (or municipal agency), county, or district of the Commonwealth of Massachusetts, or a municipal housing authority.
MassDEP may waive the adjudicatory hearing-filing fee for a person who shows that paying the fee will create an undue financial hardship. A person seeking a waiver must file, together with the hearing request as provided above, an affidavit setting forth the facts believed to support the claim of undue financial hardship.

Enclosed is a stamped approved copy of the application submittal.

Should you have any questions concerning this Plan Approval, please contact Mr. Mun Wong by telephone at 978-694-3286, or in writing at the letterhead address.

Sincerely,

This final document copy is being provided to you electronically by the Department of Environmental Protection. A signed copy of this document is on file at the DEP office listed on the letterhead.

Mun S. Wong
Environmental Engineer

This final document copy is being provided to you electronically by the Department of Environmental Protection. A signed copy of this document is on file at the DEP office listed on the letterhead.

James E. Belsky
Permit Chief
Bureau of Waste Prevention

cc: Board of Health, Town hall, 21 Depot Square, Sheffield, MA 02157
Fire Headquarters, PO Box 860, 65 Depot Square, Sheffield, MA 02157
MassDEP/Boston - Yi. Tian (E-Copy)
MassDEP/NERO – M. Wong, M. Altobelli, M. Persky
MassDEP/WERO – M. Simpson
O'Reilly, Talbot & Okum Associates, 293 Bridge Street, Suite 500, Springfield, MA 01103 ATTN: Mr. James Gagnon