

**MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY
AIR QUALITY DIVISION**

July 3, 2013

PERMIT TO INSTALL
163-08B

ISSUED TO
Sietsema Farms Feeds, LLC

LOCATED AT
19117 Lake Montcalm Road
Howard City, Michigan

IN THE COUNTY OF
Montcalm

STATE REGISTRATION NUMBER
N8057

The Air Quality Division has approved this Permit to Install, pursuant to the delegation of authority from the Michigan Department of Environmental Quality. This permit is hereby issued in accordance with and subject to Section 5505(1) of Article II, Chapter I, Part 55, Air Pollution Control, of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended. Pursuant to Air Pollution Control Rule 336.1201(1), this permit constitutes the permittee's authority to install the identified emission unit(s) in accordance with all administrative rules of the Department and the attached conditions. Operation of the emission unit(s) identified in this Permit to Install is allowed pursuant to Rule 336.1201(6).

DATE OF RECEIPT OF ALL INFORMATION REQUIRED BY RULE 203:

March 21, 2013

DATE PERMIT TO INSTALL APPROVED:

July 3, 2013

SIGNATURE:

DATE PERMIT VOIDED:

SIGNATURE:

DATE PERMIT REVOKED:

SIGNATURE:

PERMIT TO INSTALL

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Common Abbreviations / Acronyms

Common Acronyms		Pollutant/Measurement Abbreviations	
AQD	Air Quality Division	BTU	British Thermal Unit
ANSI	American National Standards Institute	°C	Degrees Celsius
BACT	Best Available Control Technology	CO	Carbon Monoxide
CAA	Clean Air Act	dscf	Dry standard cubic foot
CEM	Continuous Emission Monitoring	dscm	Dry standard cubic meter
CFR	Code of Federal Regulations	°F	Degrees Fahrenheit
COM	Continuous Opacity Monitoring	gr	Grains
EPA	Environmental Protection Agency	Hg	Mercury
EU	Emission Unit	hr	Hour
FG	Flexible Group	H ₂ S	Hydrogen Sulfide
GACS	Gallon of Applied Coating Solids	hp	Horsepower
GC	General Condition	lb	Pound
HAP	Hazardous Air Pollutant	m	Meter
HVLP	High Volume Low Pressure *	mg	Milligram
ID	Identification	mm	Millimeter
LAER	Lowest Achievable Emission Rate	MM	Million
MACT	Maximum Achievable Control Technology	MW	Megawatts
MAERS	Michigan Air Emissions Reporting System	ng	Nanogram
MAP	Malfunction Abatement Plan	NO _x	Oxides of Nitrogen
MDEQ	Michigan Department of Environmental Quality	PM	Particulate Matter
MIOSHA	Michigan Occupational Safety & Health Administration	PM10	PM less than 10 microns diameter
MSDS	Material Safety Data Sheet	PM2.5	PM less than 2.5 microns diameter
NESHAP	National Emission Standard for Hazardous Air Pollutants	pph	Pound per hour
NSPS	New Source Performance Standards	ppm	Parts per million
NSR	New Source Review	ppmv	Parts per million by volume
PS	Performance Specification	ppmw	Parts per million by weight
PSD	Prevention of Significant Deterioration	psia	Pounds per square inch absolute
PTE	Permanent Total Enclosure	psig	Pounds per square inch gauge
PTI	Permit to Install	scf	Standard cubic feet
RACT	Reasonably Available Control Technology	sec	Seconds
ROP	Renewable Operating Permit	SO ₂	Sulfur Dioxide
SC	Special Condition	THC	Total Hydrocarbons
SCR	Selective Catalytic Reduction	tpy	Tons per year
SRN	State Registration Number	µg	Microgram
TAC	Toxic Air Contaminant	VOC	Volatile Organic Compounds
TEQ	Toxicity Equivalence Quotient	yr	Year
VE	Visible Emissions		

* For High Volume Low Pressure (HVLP) applicators, the pressure measured at the HVLP gun air cap shall not exceed ten (10) pounds per square inch gauge (psig).

GENERAL CONDITIONS

1. The process or process equipment covered by this permit shall not be reconstructed, relocated, or modified, unless a Permit to Install authorizing such action is issued by the Department, except to the extent such action is exempt from the Permit to Install requirements by any applicable rule. **(R 336.1201(1))**
2. If the installation, construction, reconstruction, relocation, or modification of the equipment for which this permit has been approved has not commenced within 18 months, or has been interrupted for 18 months, this permit shall become void unless otherwise authorized by the Department. Furthermore, the permittee or the designated authorized agent shall notify the Department via the Supervisor, Permit Section, Air Quality Division, Michigan Department of Environmental Quality, P.O. Box 30260, Lansing, Michigan 48909, if it is decided not to pursue the installation, construction, reconstruction, relocation, or modification of the equipment allowed by this Permit to Install. **(R 336.1201(4))**
3. If this Permit to Install is issued for a process or process equipment located at a stationary source that is not subject to the Renewable Operating Permit program requirements pursuant to R 336.1210, operation of the process or process equipment is allowed by this permit if the equipment performs in accordance with the terms and conditions of this Permit to Install. **(R 336.1201(6)(b))**
4. The Department may, after notice and opportunity for a hearing, revoke this Permit to Install if evidence indicates the process or process equipment is not performing in accordance with the terms and conditions of this permit or is violating the Department's rules or the Clean Air Act. **(R 336.1201(8), Section 5510 of Act 451, PA 1994)**
5. The terms and conditions of this Permit to Install shall apply to any person or legal entity that now or hereafter owns or operates the process or process equipment at the location authorized by this Permit to Install. If the new owner or operator submits a written request to the Department pursuant to R 336.1219 and the Department approves the request, this permit will be amended to reflect the change of ownership or operational control. The request must include all of the information required by subrules (1)(a), (b), and (c) of R 336.1219 and shall be sent to the District Supervisor, Air Quality Division, Michigan Department of Environmental Quality. **(R 336.1219)**
6. Operation of this equipment shall not result in the emission of an air contaminant which causes injurious effects to human health or safety, animal life, plant life of significant economic value, or property, or which causes unreasonable interference with the comfortable enjoyment of life and property. **(R 336.1901)**
7. The permittee shall provide notice of an abnormal condition, start-up, shutdown, or malfunction that results in emissions of a hazardous or toxic air pollutant which continue for more than one hour in excess of any applicable standard or limitation, or emissions of any air contaminant continuing for more than two hours in excess of an applicable standard or limitation, as required in Rule 912, to the Department. The notice shall be provided not later than two business days after start-up, shutdown, or discovery of the abnormal condition or malfunction. Written reports, if required, must be filed with the Department within 10 days after the start-up or shutdown occurred, within 10 days after the abnormal conditions or malfunction has been corrected, or within 30 days of discovery of the abnormal condition or malfunction, whichever is first. The written reports shall include all of the information required in Rule 912(5). **(R 336.1912)**
8. Approval of this permit does not exempt the permittee from complying with any future applicable requirements which may be promulgated under Part 55 of 1994 PA 451, as amended or the Federal Clean Air Act.
9. Approval of this permit does not obviate the necessity of obtaining such permits or approvals from other units of government as required by law.
10. Operation of this equipment may be subject to other requirements of Part 55 of 1994 PA 451, as amended and the rules promulgated thereunder.

11. Except as provided in subrules (2) and (3) or unless the special conditions of the Permit to Install include an alternate opacity limit established pursuant to subrule (4) of R 336.1301, the permittee shall not cause or permit to be discharged into the outer air from a process or process equipment a visible emission of density greater than the most stringent of the following. The grading of visible emissions shall be determined in accordance with R 336.1303. **(R 336.1301)**
 - a) A six-minute average of 20 percent opacity, except for one six-minute average per hour of not more than 27 percent opacity.
 - b) A visible emission limit specified by an applicable federal new source performance standard.
 - c) A visible emission limit specified as a condition of this Permit to Install.

12. Collected air contaminants shall be removed as necessary to maintain the equipment at the required operating efficiency. The collection and disposal of air contaminants shall be performed in a manner so as to minimize the introduction of contaminants to the outer air. Transport of collected air contaminants in Priority I and II areas requires the use of material handling methods specified in R 336.1370(2). **(R 336.1370)**

13. The Department may require the permittee to conduct acceptable performance tests, at the permittee's expense, in accordance with R 336.2001 and R 336.2003, under any of the conditions listed in R 336.2001. **(R 336.2001)**

SPECIAL CONDITIONS

EMISSION UNIT SUMMARY TABLE

The descriptions provided below are for informational purposes and do not constitute enforceable conditions.

Emission Unit ID	Emission Unit Description (Process Equipment & Control Devices)	Flexible Group ID
EUGASIFY	Gasification unit for animal litter/manure and associated animal bedding, capable of generating electricity and steam. The gasification unit consists of a rotary gasifier, high efficiency cyclone and a staged-combustion oxidizer, followed by a waste heat boiler, and a wet electrostatic precipitator (WESP). The process includes a steam turbine and an electric generator. Total maximum heat input for the gasification unit is 25.5 MMBTU/hr.	NA
Changes to the equipment described in this table are subject to the requirements of R 336.1201, except as allowed by R 336.1278 to R 336.1290.		

The following conditions apply to: EUGASIFY

DESCRIPTION: Gasification unit for animal litter/manure and associated animal bedding, capable of generating electricity and steam. The gasification unit consists of a rotary gasifier, high efficiency cyclone and a staged-combustion oxidizer, followed by a waste heat boiler, and a WESP. The process includes a steam turbine and an electric generator. Total maximum heat input for the gasification unit is 25.5 MMBTU/hr.

POLLUTION CONTROL EQUIPMENT: High efficiency cyclone, WESP

I. EMISSION LIMITS

Pollutant	Limit	Time Period / Operating Scenario	Equipment	Testing / Monitoring Method	Underlying Applicable Requirements
1. NO _x	7.8 lb/hr	Test Protocol	EUGASIFY	GC 13, SC V.1	40 CFR 52.21(c) and (d)
2. CO	100 ppm	Test Protocol	EUGASIFY	GC 13, SC V.1	40 CFR 52.21(d)
3. Filterable PM	5.0 lb/hr	Test Protocol	EUGASIFY	GC 13, SC V.1	R 336.1331
4. PM ₁₀	3.4 lb/hr	Test Protocol	EUGASIFY	GC 13, SC V.1	40 CFR 52.21(c) and (d)
5. PM _{2.5}	2.1 lb/hr	Test Protocol	EUGASIFY	GC 13, SC V.1	40 CFR 52.21(c) and (d)
6. SO ₂	2.4 lb/hr	Test Protocol	EUGASIFY	GC 13, SC V.1	40 CFR 52.21(c) and (d)
7. HCl	0.80 lb/hr	Test Protocol	EUGASIFY	GC 13, SC V.1	R 336.1224, R 336.1225

II. MATERIAL LIMITS

Material	Limit	Time Period / Operating Scenario	Equipment	Testing / Monitoring Method	Underlying Applicable Requirements
1. Total feed rate	180,000 lb per calendar day	Daily	EUGASIFY	SC VI.5	R 336.1224, R 336.1225, 40 CFR 52.21(c) and (d)

2. The permittee shall feed only the following materials to EUGASIFY. **(R 336.1224, R 336.1225, 40 CFR 52.21(c) and (d), 40 CFR Part 60 Subpart Dc)**
- a. Animal manure including litter and other bedding material (including but not limited to, wood chips, millings, and shavings, straw, and crop bi-products such as stovers, stalks, and cobs).
 - b. Fuel to the burners: sweet natural gas.

III. PROCESS/OPERATIONAL RESTRICTIONS

1. The permittee shall comply with all provisions of the federal Standards of Performance for New Stationary Sources as specified in 40 CFR Part 60 Subparts A and Dc, as they apply to EUGASIFY. **(40 CFR Part 60 Subparts A & Dc)**
2. The heat input of material fed to and fuel burned in EUGASIFY shall not exceed a maximum of 25.5 MMBTU per hour. **(R 336.1225, 40 CFR 52.21(c) and (d), 40 CFR Part 60 Subpart Dc)**
3. The permittee shall only feed material to the rotary gasifier when the minimum temperature in the oxidizer portion of EUGASIFY is 1,400 degrees F during startup, 1,450 degrees during normal operations, and a minimum retention time in the oxidizer portion of EUGASIFY of 1.5 seconds is maintained. "Startup" is defined as those periods of time when natural gas is being combusted to assist in synthetic gas production in the gasifier. "Normal operation" is defined as those periods of time when natural gas is not being used to develop synthetic gas in the gasifier for combustion in the oxidizer. **(R 336.1224, R 336.1225, R 336.1702)**
4. The permittee shall immediately cease the input feed to the rotary gasifier, consistent with safe operating procedures, upon opening of the emergency relief stack (ERS). Input feed to the rotary gasifier shall not restart until the oxidizer is back on-line and operating in a satisfactory manner. **(R 336.1224, R 336.1225, 40 CFR 52.21(c) and (d))**
5. The permittee shall not operate EUGASIFY unless a malfunction abatement plan (MAP) as described in Rule 911(2), for all operations in EUGASIFY, has been submitted. The permittee shall submit the MAP and any amendments to the MAP to the AQD Grand Rapids District Supervisor for review and approval. Within 180 days after the MAP has been approved, the MAP shall be implemented and maintained. If at any time the MAP fails to address or inadequately addresses an event that meets the characteristics of a malfunction, the permittee shall amend the MAP within 45 days after such an event occurs. The permittee shall also amend the MAP within 45 days, if new equipment is installed or upon request from the AQD Grand Rapids District Supervisor. If the AQD does not notify the permittee within 90 days of submittal, the MAP or amended MAP shall be considered approved. Until the MAP or an amended plan is approved, the permittee shall implement corrective procedures or operational changes to achieve compliance with all applicable emission limits. **(R 336.1225, R 336.1331, R 336.1910, R 336.1911, R 336.1915)**
6. The permittee shall collect, handle, store, and transport solids discharged from the rotary gasifier portion of EUGASIFY in a manner so as to minimize the introduction of contaminants to the outer air. **(R 336.1370(1))**
7. The permittee shall operate the WESP with inlet water flow rate, and secondary voltage and current, in accordance with the manufacturers recommended operating parameters. **(R 336.1225, R 336.1331)**

8. Upon completion of the installation of the WESP and the high efficiency cyclone, the permittee shall not operate EUGASIFY unless the WESP and the high efficiency cyclone have been installed, maintained, and are operating in a satisfactory manner. **(R 336.1910)**

IV. DESIGN/EQUIPMENT PARAMETERS

1. The permittee shall equip and maintain equipment to monitor the feed rate to the rotary gasifier. **(R 336.1224, R 336.1225, 40 CFR 52.21(c) and (d))**
2. The permittee shall equip and maintain the oxidizer with equipment to indicate the minimum combustion temperature in the oxidizer. **(R 336.1225, R 336.1702)**

V. TESTING/SAMPLING

Records shall be maintained on file for a period of five years. **(R 336.1201(3))**

1. Within 120 days of commencement of trial operations, the permittee shall verify NO_x, CO, filterable PM, PM₁₀, PM_{2.5}, SO₂, visible emissions, and HCl emission rates from EUGASIFY by testing at owner's expense, in accordance with Department requirements. No less than 30 days prior to testing, the permittee shall submit a complete test plan to the AQD. The AQD must approve the final plan prior to testing. Verification of emission rates includes the submittal of a complete report of the test results to the AQD within 60 days following the last date of the test. **(R 336.1224, R 336.1225, R 336.1331, R 336.2001, R 336.2003, R 336.2004)**

VI. MONITORING/RECORDKEEPING

Records shall be maintained on file for a period of five years. **(R 336.1201(3))**

1. The permittee shall monitor emissions and operating information for EUGASIFY in accordance with the federal Standards of Performance for New Stationary Sources as specified in 40 CFR Part 60 Subparts A and Dc. The permittee shall keep records of all source emissions data and operating information on file at the facility and make them available upon request. **(40 CFR Part 60 Subparts A & Dc)**
2. The permittee shall monitor, in a satisfactory manner, the minimum temperature in the oxidizer portion of EUGASIFY on a continuous basis. For purposes of this requirement, measurement and recording of the integrated temperature at intervals of six (6) seconds or less shall be considered continuous. **(R 336.1224, R 336.1225)**
3. The permittee shall keep on file at the facility, in a satisfactory manner, temperature in the thermal oxidizer and make the records available to the Department upon request. **(R 336.1224, R 336.1225)**
4. The permittee shall monitor and record, in a satisfactory manner, the time and duration of each ERS opening. The permittee shall keep all records on file at the facility and make them available to the Department upon request. **(R 336.1224, R 336.1225)**
5. The permittee shall monitor and record, in a satisfactory manner, the amount of material fed to the rotary gasifier on a daily basis. **(R 336.1224, R 336.1225)**

VII. REPORTING

1. The permittee shall provide written notification of construction and operation to comply with the federal Standards of Performance for New Stationary Sources, 40 CFR 60.7. The permittee shall submit this notification to the AQD District Supervisor within the time frames specified in 40 CFR 60.7. **(40 CFR 60.7)**

VIII. STACK/VENT RESTRICTIONS

The exhaust gases from the stacks listed in the table below shall be discharged unobstructed vertically upwards to the ambient air unless otherwise noted:

Stack & Vent ID	Maximum Exhaust Dimensions (inches)	Minimum Height Above Ground (feet)	Underlying Applicable Requirements
1. SVGASIFY	34	43	R 336.1225, 52.21(c) and (d)

IX. OTHER REQUIREMENTS

1. Within 30 days of written notification from Michigan Department of Agriculture and Rural Development to Sietsema Farms Feeds, LLC, of nonconformance with Generally Accepted Agricultural Management Practices (GAAMPs) developed pursuant to Act 93, the permittee shall submit to the AQD Grand Rapids District Supervisor, for review and approval, a Nuisance Minimization Plan which addresses the issues of GAAMPs nonconformance. Upon approval of the Nuisance Minimization Plan by the AQD Grand Rapids District Supervisor, the Nuisance Minimization Plan and any subsequent revisions shall be implemented for the duration of the permitted activities at this site. The Nuisance Minimization Plan shall be reviewed by Sietsema Farms Feeds, LLC annually, updated where appropriate, and any updates submitted to the AQD Grand Rapids District Supervisor for review and approval. **(R 336.1901)**