

217/782-2113

CONSTRUCTION PERMIT -- REVISED
NSPS/NESHAP SOURCE

PERMITTEE

Winnebago Energy Center, LLC.
c/o: Integrys Energy Services
Attn: Scott E. Johnson
1716 Lawrence Drive
De Pere, Wisconsin 54115

Application No.: 07030094

I.D. No.: 201801AAN

Applicant's Designation:

Date Received: August 10, 2009

Subject: Landfill Gas to Energy Facility

Date Issued:

Location: Winnebago Landfill, 8403 Lindenwood Road, Rockford

Permit is hereby granted to the above-designated Permittee to CONSTRUCT emission source(s) and/or air pollution control equipment consisting of a landfill gas-to-energy facility, including four landfill gas (LFG) fired reciprocating internal combustion engines (the affected engines), as described in the above-referenced application. This Permit is subject to standard conditions attached hereto and the following special conditions:

1. Introduction

- a. This permit authorizes construction of four LFG fired internal combustion engines (Caterpillar Model 3520C) for a new gas-to-energy facility that will utilize LFG collected from the North and South Units of the Winnebago Landfill to generate electricity. The Winnebago Landfill (formerly the Pagel Landfill) is owned and operated by Winnebago Reclamation Services (I.D. No. 201801AAF). The affected facility and the associated landfill are considered to be a single source pursuant to 40 CFR 52.21(b)(6), 35 IAC 211.6130, and Section 39.5(1) of the Illinois Environmental Protection Act.
- b. This revised permit increases the permitted emissions of SO₂ from the affected facility addressing recent data for the sulfur content of the LFG collected at the affected landfill, which is higher than the value provided in the original application in 2007.
- c. For the purpose of this permit, the "affected facility" is the new gas-to-energy facility." The "affected engines" are the four engines at the affected facility. The "associated landfill" is the associated Winnebago Landfill. The combination of the affected facility and the North and South Units of the associated landfill is referred as "the existing source."
- d. This permit is issued based on the flares at the associated landfill remaining in service as a backup to the affected facility, to control LFG when the facility is not in service or the flow of LFG is more than the facility can handle.

2. Applicable State Emission Standards

- a. The affected facility is subject to 35 IAC 212.301, which provides that no person shall cause or allow the emission of fugitive particulate matter from any process, including any material handling or storage activity, that is visible by an observer looking generally toward the zenith (i.e., overhead) overhead at a point beyond the property line of the source unless the wind speed is greater than 40.2 kilometers per hour (25 miles per hour), as provided by 35 IAC 212.314.
- b. The affected engines are subject to 35 IAC 212.123(a), which provides that no person shall cause or allow emissions of smoke or other particulate matter (PM) from an emission unit to exceed 30 percent opacity.
- c. The affected engines are subject to 35 IAC 214.301, which provides that no person shall cause or allow the emissions of sulfur dioxide (SO₂) into the atmosphere from any process emission unit to exceed 2000 ppm.

3. Applicable Federal Emission Standards for MSW Landfills

- a.
 - i. The affected facility is subject to the New Source Performance Standards (NSPS) for Municipal Solid Waste Landfills, 40 CFR 60 Subpart WWW and related requirements in 40 CFR 60 Subpart A, General Provisions (the Landfill NSPS). Pursuant to the Landfill NSPS, emissions from any atmospheric vent from a LFG treatment system at the facility, including any compressor, are subject to the requirements of 40 CFR 60.752(b)(2)(iii)(A) and (B).

Note: The affected facility is subject to the Landfill NSPS because the associated landfill is subject to this NSPS and the facility receives untreated LFG collected from the landfill. For the purpose of the Landfill NSPS, this permit is issued based on the Permittee treating the LFG that is combusted at the affected facility (i.e., processing the LFG with compression, de-watering and filtration, with a system designed and operated to remove nonmethane organic compounds (NMOC) from the collected LFG in accordance with 40 CFR 60.752(b)(iii)(C)). As a consequence, the affected engines are not subject to the emission standards of the Landfill NSPS, pursuant to a determination for the affected facility made by the USEPA in a letter dated April 30, 2007. Compliance with the Landfill NSPS is not dependent upon the control efficiency for NMOC achieved by the engines and emission testing of the engines is not required pursuant to this NSPS.

- ii. If affected engine(s) are relied upon to comply with the emission standards of the Landfill NSPS (e.g., the LFG

treatment system is removed), the Permittee shall comply with the applicable requirements of the Landfill NSPS for the engine(s), including having timely performance tests conducted for the engine(s) as required pursuant to this NSPS.

- b. The affected facility is subject to the National Emission Standards for Hazardous Air Pollutants (NESHAP) for Municipal Solid Waste Landfills, 40 CFR 63, Subpart AAAA and related requirements in 40 CFR 63 Subpart A, General Provisions (the Landfill NESHAP). Pursuant to this NESHAP, 40 CFR 63.1960, the Permittee must develop and implement a written Startup, Shutdown, and Malfunction Plan for the facility in accordance with 40 CFR 63.6(e)(3).

Note: The affected facility is subject to the Landfill NSPS, it is also subject to the Landfill NESHAP.

- c. As the affected facility is subject to the Landfill NSPS and Landfill NESHAP, the Permittee shall at all times, to the extent practicable, maintain and operate the affected facility, including LFG treatment systems, in a manner consistent with good air pollution control practice for minimizing emissions, as required pursuant to 40 CFR 60.11(d) and 63.6(e)(3).

4. Applicable Federal Emission Standards for Internal Combustion Engines

- a. The Permittee shall comply with the applicable requirements of the NESHAP for Stationary Reciprocating Internal Combustion Engines, 40 CFR 63 Subpart ZZZZ, for each affected engine that meets the applicability provisions of this NESHAP, e.g., the engine is manufactured after June 11, 2006. In particular, pursuant to this NESHAP, 40 CFR 63.6590(c), each such subject engine shall comply with the applicable requirements of the NSPS for Stationary Spark Ignition Internal Combustion Engines, 40 CFR 60 Subpart JJJJ (the Engine NSPS).

Note: This permit is issued based on the source, i.e., the combination of the affected facility and the associated landfill, being an "area source" for emissions of hazardous air pollutants (HAPs), as defined by 40 CFR 63.6585(c), as it is not a major source for emissions of HAPs. As such, no further requirements apply for subject engines under the NESHAP, 40 CFR 63 Subpart ZZZZ than to comply with the Engine NSPS.

5. Other Applicable Requirements

- a. i. This permit does not relieve the Permittee of the responsibility to comply with all Local, State and Federal Regulations which are part of the applicable Illinois State Implementation Plan, as well as all other applicable Federal, State and Local requirements.

- ii. In particular, this permit does not excuse the Permittee from the obligation to undertake further actions for the affected facility as may be needed to eliminate air pollution, including nuisance due to odors, such as implementation of additional measures to assure that the operation of the facility does not interfere with effective capture and control of LFG at the associated landfill.

6. Nonapplicability Provisions

- a. This permit is issued based on this project not constituting a major modification for the purpose of the federal rules for Prevention of Significant Deterioration (PSD), 40 CFR 52.21. This is because the existing source, as limited in Condition 8(b) of this permit, was not and will continue to not be a major source of emissions under the PSD rules.
- b. This permit is also issued based on the source not being a major source of emissions of hazardous air pollutants (HAPs).

Note: Condition 7(d) of Construction Permit 09080052 currently limits emissions from the source to no more than 8 tons per year for any individual HAP and to no more than 20 tons per year of any combination of HAPs.

7. General Design and Operating Requirements

- a.
 - i. LFG shall be the principle fuel fired in the affected engines.
 - ii. The rated heat input capacity of each affected engine shall not exceed 14.5 million Btu per hour.
- b. The affected facility shall be operated in a manner consistent with good air pollution control practice to minimize emissions. For this purpose, the Permittee shall operate and maintain both the gas treatment system(s) and the affected engines in accordance with the manufacturer's written instructions for operation and maintenance of this equipment.

8. Emission Limits

- a. The emissions from the affected engines and the affected facility shall not exceed the following limits. The hourly limits shall not apply during startup of an engine.

| Pollutant | Limits | | |
|------------------------------------|----------------------------|-------------|----------|
| | Pounds/Hour Each Engine | Tons/Year | |
| | | Each Engine | Facility |
| Nitrogen Oxides (NO _x) | 2.5 | 10.8 | 43.1 |
| Carbon Monoxide (CO) | 12.3 | 53.9 | 216.0 |

| Pollutant | Limits | | |
|---|----------------------------|-------------|----------|
| | Pounds/Hour Each Engine | Tons/Year | |
| | | Each Engine | Facility |
| Particulate Matter (PM/PM ₁₀) | 0.86 | 3.8 | 15.1 |
| Volatile Organic Material (VOM) Nonmethane Organic Compounds (NMOC) | 1.0 | 4.4 | 17.6 |
| Individual Hazardous Air Pollutant (HAP) | 0.2 | 1.0 | 4.0 |
| Total Hazardous Air Pollutants (HAPs) | 0.25 | 1.1 | 4.4 |

- b. Total emissions of the existing source, e.g., the combination of the affected facility and the North and South Units at the associated landfill, shall not exceed the following limits:

- i. Annual limits:

| Pollutant | Limits (Tons/Year) |
|-----------------------|-----------------------|
| NO _x | 225 |
| CO | 235 |
| SO ₂ | 245 |
| PM/PM ₁₀ * | 80* |
| VOM/NMOC | 80 |

* Excluding fugitive dust from roadways and open areas of the landfill.

- ii. Emissions of SO₂ shall not exceed 30 tons/month.
- c. i. Compliance with annual limits shall be determined from a running total of 12 months of data.
- ii. Emissions shall be determined using appropriate emission factors which in order of preference shall be factors from on-site emission testing, manufacturer's emission data, and emission factors from the most recent edition of USEPA's *Compilation of Air Pollutant Emission Factors*, AP-42.

9. Requirements for Observations of Opacity

- a. The Permittee shall promptly conduct observations of operation and opacity of the affected engines upon written request of the Illinois EPA. Opacity shall be determined in accordance with USEPA Method 9. 22, during representative operation of the engine.

10. Requirements for Emissions Testing

- a. The Permittee shall have emission tests conducted for affected engine(s) for NMOC/VOM, HAPs, NO_x, and CO by an approved independent testing service during conditions that are representative of maximum emissions:
 - i. Within 60 days of the date that engine(s) are first relied upon as a control system for compliance with the NSPS, 40 CFR 60 Subpart WWW, or if engine(s) are relied upon periodically for compliance with this NSPS, within 60 days of relying on engine(s) for compliance for more than 15 days in a calendar year.
 - ii. Within 90 days of a written request from the Illinois EPA or the date agreed upon by the Illinois EPA, whichever is later.
- b. For each affected engine that is subject to the NSPS, 40 CFR 60 Subpart JJJJ, if emission testing is required pursuant to the NSPS, (for example, the engine is not properly operated and maintained in accordance with the requirements of 40 CFR 60.4243(a)), the Permittee shall comply with the applicable testing requirements of the NSPS for such engine.

11. Sampling and Analysis for Sulfur Content of Landfill Gas (LFG)

- a. i. The Permittee shall conduct sampling and analysis of the LFG combusted in the affected engines on at least an annual basis. The samples shall be analyzed for sulfur content (ppm) and heat content (Btu/cubic foot) of the LFG. These analyses may be performed by the operator of the associated landfill or an independent company. Written notification of testing or submittal of a formal testing protocol is not required for this activity.
- ii. The Permittee shall keep records for this activity, including both collected data and documentation for the sampling and analysis.

12. Recordkeeping Requirements for the Affected Engines

- a. As related to the NSPS, 40 CFR 60 Subpart JJJJ, for each affected engine, the Permittee shall either:
 - i. Maintain a file demonstrating that the engine is not subject to this NSPS, if the Permittee considers that it is not subject to this NSPS and is not carrying out measures to comply with this NSPS, or
 - ii. Fulfill applicable recordkeeping requirements of this NSPS for the engine.

- b. The Permittee shall maintain a file for each affected engine containing the manufacturer's data for the engine, including emissions guarantees and rated heat input capacity (million Btu/hour), and operating and maintenance procedures recommended by the manufacturer.
- c. The Permittee shall keep a log or other records for the operation of each affected engine that includes the following information:
 - i. Information identifying periods when the engine was not in service.
 - ii. For periods when the engine is in service and operating normally, relevant process information to generally confirm normal operation.
 - iii. For periods when the engine is in service and is not operating normally, identification of each such period, with detailed information describing the operation of the engine, the potential consequences for additional emissions, the potential of any excess emissions, the actions taken to restore normal operation, and any actions taken to prevent similar events in the future.
 - iv. Other information as may be appropriate to show that the engine is operated in accordance with good air pollution control practices.
- d. The Permittee shall keep a log or other records for the inspection, maintenance and repair for each affected engine that, at a minimum, includes the dates and the nature of such activities.
- e. The Permittee shall maintain records for all opacity measurements made in accordance with USEPA Method 9 for the affected engines that the Permittee conducts or that are conducted on its behalf by individuals who are qualified to make such observations. For each occasion on which such observations are made, these records shall include the identity of the observer, a description of the various observations that were made, the observed opacity, and copies of the raw data sheets for the observations.

13. Recordkeeping Requirements for the Affected Facility

- a. The Permittee shall maintain operating records for the affected facility as necessary to:
 - i. Demonstrate compliance with the applicable emission standards of the Landfill NSPS, including actions taken by the Permittee to verify that the LFG supply to the affected engines has been properly treated and any period when

engines were relied upon or should have been relied upon for compliance, with explanation.

- ii. Determine emissions of the facility, including monthly LFG consumption by the engines and sulfur content of the LFG, based on representative sampling and analysis for its composition.
- b. The Permittee shall maintain a file of the written instructions being followed by the Permittee as good air pollution control practice for the facility to minimize emissions in accordance with Condition 3(c).
- c. The Permittee shall maintain the following records related to emissions of the affected facility:
 - i. A file identifying the maximum level(s) of sulfur in LFG combusted at the facility at which compliance with 35 IAC 214.301 is maintained, with supporting documentation and analysis.
 - ii. A file containing: 1) The emission factors or emission rates used by the Permittee for calculating emissions of NO_x, CO, PM, VOM, NMOC and HAPs, with supporting documentation; and 2) Engineering calculations for the maximum hourly emissions of NO_x, CO, PM, VOM, NMOC and HAPs from the flare.
 - iii. Records of the emissions of NO_x, CO, SO₂, PM, VOM, NMOC and HAPs from the facility (tons/month and tons/year), based on the operation of the facility, the composition of the LFG and the appropriate emission factors, with supporting data and calculations, which shall be compiled on at least a quarterly basis.
- d. The Permittee shall maintain records of the emissions of NO_x, CO and SO₂ from the source, i.e., the affected facility and the associated landfill (tons/month and tons/year), with supporting documentation and calculations. For this purpose, for the emissions from the associated landfill, the Permittee may on a routine basis obtain a copy of the emission data from the operator of the landfill, with supporting documentation and calculations.

14. Retention of Records

All records and logs required by this permit shall be retained at a readily accessible location at the source for at least five years from the date of entry and shall be made available for inspection and copying by the Illinois EPA or USEPA upon request. Any records retained in an electronic format (e.g., computer) shall be capable of being retrieved and printed on paper during normal source office hours

so as to be able to respond to an Illinois EPA or USEPA request for records during the course of a source inspection.

15. Notification and Reporting Requirements

- a. The Permittee shall fulfill applicable notification and reporting requirements of the NSPS, 40 CFR 60 Subpart JJJJ, for each affected engine that meets the applicability provisions of these rules.
- b. If there is any deviation from the requirements of this permit, the Permittee shall submit a report to the Illinois EPA as follows, unless otherwise specified in the CAAPP permit for the source. The report shall include the emissions released in accordance with the recordkeeping requirements, a copy of the relevant records, and a description of the deviation or violation and efforts to reduce emissions and future occurrences.
 - i. Deviations from annual emission limits shall be reported within 30 days.
 - ii. Deviations from other requirements shall be reported in a quarterly report unless more rapid reporting is required by other regulating agencies.
- c.
 - i. The Permittee shall notify the Illinois EPA with its semi-annual compliance reports if affected engine have been relied upon for compliance with NSPS, 40 CFR 60 Subpart WWW during outages of the LFG treatment system, with identification of each such outage and explanation.
 - ii. The Permittee shall notify the Illinois EPA within 10 days if affected engines are being relied upon for routine compliance with NSPS, 40 CFR 60 Subpart WWW (rather than treatment of LFG), with explanation.
- d. If affected engines are being relied upon for routine compliance with NSPS, 40 CFR 60 Subpart WWW, the Permittee shall notify the Permittee for the associated landfill (i.e., Winnebago Reclamation Services) and the Illinois EPA as soon as it becomes aware that the affected facility will not or is not controlling collected LFG so as to comply with requirements for control of LFG as applicable rather than treatment of LFG.
- e. The Permittee shall notify the Illinois EPA when an affected engine is permanently removed from service. This notification shall include, a demonstration that the remaining engine(s) and the flares at the associated landfills continue to be sufficient to control all LFG being generated from the landfills.

- f. Two copies of all reports, notifications, and correspondence required by this permit shall be sent to:

Illinois Environmental Protection Agency
Division of Air Pollution Control
Compliance Section (#40)
P.O. Box 19276
Springfield, Illinois 62794-9276

Tel: 217/782-5811

Fax: 217/782-6348

And one (1) copy shall be sent to:

Illinois Environmental Protection Agency
Division of Air Pollution Control
5407 North University
Peoria, Illinois 61614

Tel: 309-693-5461

Fax: 309-693-5467

16. Coordination with the Operation of the Associated Landfill

- a. The Permittee shall take appropriate measures to allow the Permittee for the associated landfill to assure applicable requirements of the Landfill NSPS and Landfill NESHAP related to control of LFG are being met, including:
- i. Keeping all applicable records and making all applicable notifications and reports required by these standards.
 - ii. Keeping copies of the applicable records, notifications and reports required by these standards and allowing access to this material by the Permittee for the landfill.

17. Future Changes to the Affected Engines

- a. i. This permit authorizes installation of manufacturer supplied replacement engine and engine components for the affected engines that takes place either as part of scheduled maintenance of the engines or in the event of malfunction or unscheduled outage and subsequent repairs. This authorization does not address activities for which a construction permit is not required, such as routine preventive maintenance, minor replacement of engine components or assemblies, or activities that do not involve, either directly or indirectly, emission-related components or activities that do not involve, either directly or indirectly, emission-related components or assemblies of the engines.
- ii. This authorization is limited to activities that can be accommodated by the original installation of the affected

engines and that are performed in conjunction with an ongoing program of maintenance, repair, and replacement, so as to not constitute a modification with respect to PSD. This authorization does not extend to installation of a replacement engine that is a different make and model than the original engine or to activities that are intended to, or would have the result of, increasing the design capacity of an engine.

- iii. This authorization also does not excuse the Permittee from any new regulatory requirements that are adopted and applicable to the engines.
- b. The Permittee shall expeditiously have performance testing conducted on an engine following replacement of components or assemblies, if requested by the Illinois EPA.
- c. The Permittee shall maintain following records at the affected facility for the replacement activities authorized by this permit. These records shall be retained for at least five years after the date that the engine is permanently removed from service:
 - i. A file containing the paperwork for original and replacement engine components or engines, including documentation for engine model numbers and serial numbers and copies of the specifications for the engines.
 - ii. Details of activities performed pursuant to this permit including the date that the engine is removed from the service and the date the engine is returned to service.
- d. The Permittee shall notify the Illinois EPA prior to carrying out activities pursuant to this condition. This notification shall be submitted at least 15 days in advance or as soon as it is practicable to do so, e.g., in the event of engine failure. This notification shall include:
 - i. The Permittee's determination whether the activities involve installation of a new or reconstructed engine, and identification of the current status of the source with respect to emissions of HAPs, i.e., major or non-major, with explanation.
 - ii. A description of the activities that are to be performed and the expected schedule for the activities.
 - iii. A confirmation that the activities fall within the authorization provided by this permit, the replacement is or will be in good operating conditions, and the outage of a engine will not prevent or interfere with compliance with

applicable requirements for control of emissions, with supporting information.

- iv. The Permittee's determination whether the activities involve installation of a new or reconstructed engine, and identification of the current status of the source with respect to emissions of HAPs, i.e., major or non-major, with explanation.
- e. The authorization provided by this condition for the affected engines will terminate for an engine when an engine is permanently removed from service or 30 days after notification from the Illinois EPA that this authorization is being terminated, whichever occurs first. As related to the replacement activities authorized by this permit, this condition supersedes Standard Condition 1.

18. Authorization to Operate

The Permittee may operate the affected facility pursuant to this construction permit until a CAAPP permit is issued for the facility provided that a complete and timely application for a CAAPP permit is submitted to the Illinois EPA. This condition supersedes Standard Condition 6.

Please note that this permit has been revised at the request of the Permittee to increase the permitted emissions of SO₂ and CO from the affected facility. This accommodates use of additional LFG by the facility. For SO₂, this also addresses recent data for the sulfur content of the LFG, which is higher than the value provided in the original application in 2007. The revised permit also makes related changes to requirements for sampling and analysis of LFG, and the recordkeeping and reporting requirements for the facility. In addition, the revised permit more clearly addresses the applicability of the regulatory requirements to the facility and the affected engines and better coordinates the requirements for the facility, as addressed in this permit, with other permits for the source.

If you have any questions on this, please call Kunj Patel at 217/782-2113

Edwin C. Bakowski, P.E.
Manager, Permit Section
Division of Air Pollution Control

Date Signed: _____

ECB:CPR:KMP:psj

cc: Region 2