



State of Ohio Environmental Protection Agency

Street Address:

Mailing Address:

TELE: (614) 644-3020 FAX: (614) 644-2329

08/13/01

CERTIFIED MAIL

RE: Final Chapter 3745-35 Permit To Operate

P004 (Flare Burner #3)

Waste Digester Gas Flare Burner

City of Dayton Wastewater Treatment Plant (08-57-10-0983)

Thomas Schommer

2800 Guthrie Road

Dayton, OH 45418

Dear Thomas Schommer:

The enclosed Permit(s) to Operate allow you to operate the described emissions unit(s) in the manner indicated in the Permit(s). Because each permit contains several terms and conditions, I urge you to read them carefully.

The Ohio EPA is urging companies to investigate pollution prevention and energy conservation. Not only will this reduce pollution and energy consumption, but it can also save you money. If you would like to learn ways you can save money while protecting the environment, please contact our Office of Pollution Prevention at (614) 644-3469.

You are hereby notified that this action of the Director is final and may be appealed to the Environmental Review Appeals Commission pursuant to Section 3745.04 of the Ohio Revised Code. The appeal must be in writing and set forth the action complained of and the grounds upon which the appeal is based. It must be filed with the Environmental Review Appeals Commission within thirty (30) days after notice of the Director's action. A copy of the appeal must be served on the Director of the Ohio Environmental Protection Agency within three (3) days of filing with the Commission. It is also requested by the Director that a copy of the appeal be served upon the Environmental Enforcement Section of the Office of the Attorney General. An appeal may be filed with the Environmental Review Appeals Commission at the following address:

Environmental Review Appeals Commission
236 East Town Street
Room 300
Columbus, Ohio 43215

If you have any questions, please contact the RAPCA at (937) 225-4435.

Very truly yours,

Thomas G. Rigo, Manager
Field Operations and Permit Section
Division of Air Pollution Control

cc: RAPCA



State of Ohio Environmental Protection Agency

Final Permit To Operate An Emissions Unit

Effective Date: 08/13/01

Expiration Date: 08/13/06

This document constitutes issuance to

Facility ID: 08-57-10-0983
City of Dayton Wastewater Treatment Plant
2800 Guthrie Rd.
Dayton, OH 45418

of a permit to operate for:

P004 (Flare Burner #3)
Waste Digester Gas Flare Burner

You will be contacted six months prior to the expiration date regarding the renewal of this permit. If you are not contacted, please contact the appropriate Ohio EPA District Office or local air agency identified below. This permit and the authorization to operate the air contaminant source (emissions unit) at this facility shall expire at midnight on the expiration date shown above. If a renewal permit is not issued prior to the expiration date, the permittee may continue to operate pursuant to OAC Chapter 3745-35 and in accordance with the terms of this permit beyond the expiration date, provided that a complete renewal application is submitted no earlier than eighteen (18) months and no later than one-hundred eighty (180) days prior to the expiration date.

Described below is the Ohio EPA District Office or local air agency that is responsible for processing and administering your Title V permit:

RAPCA
451 West Third Street
PO Box 972
Dayton, OH 45422
(937) 225-4435

This permit is granted subject to the conditions attached hereto.

OHIO ENVIRONMENTAL PROTECTION AGENCY

A handwritten signature in black ink, appearing to read "Christopher Jones", written over a horizontal line.

Christopher Jones
Director

Part I: General Terms and Conditions

1. Compliance Requirements

The above-described emissions unit is and shall remain in full compliance with all applicable State and federal laws and regulations and the terms and conditions of this permit.

2. Permit to Install Requirement

Prior to the "installation" or "modification" of any "air contaminant source," as those terms are defined in OAC rule 3745-31-01, a permit to install must be obtained from the Ohio EPA pursuant to OAC Chapter 3745-31.

3. Reporting Requirements Related to Monitoring and Recordkeeping Requirements

The permittee shall submit required reports in the following manner.

- a. Reports of any required monitoring and/or recordkeeping information shall be submitted to the appropriate Ohio EPA District Office or local air agency.
- b. Except as otherwise may be provided in the terms and conditions for a specific emissions unit, quarterly written reports of (a) any deviations (excursions) from emission limitations, operational restrictions, and control device operating parameter limitations that have been detected by the testing, monitoring, and recordkeeping requirements specified in this permit, (b) the probable cause of such deviations, and (c) any corrective actions or preventive measures which have been or will be taken, shall be submitted to the appropriate Ohio EPA District Office or local air agency. If no deviations occurred during a calendar quarter, the permittee shall submit a quarterly report, which states that no deviations occurred during that quarter. The reports shall be submitted quarterly, i.e., by January 31, April 30, July 31, and October 31 of each year and shall cover the previous calendar quarters. (These quarterly reports shall exclude deviations resulting from malfunctions reported in accordance with OAC rule 3745-15-06.)

4. Records Retention Requirements

Each record of any monitoring data, testing data, and support information required pursuant to this permit shall be retained for a period of five years from the date the record was created. Support information shall include, but not be limited to, all calibration and maintenance records and all original strip-chart recordings for continuous monitoring instrumentation, and copies of all reports required by the permit. Such records may be maintained in computerized form.

5. Inspections and Information Requests

The Director of the Ohio EPA, or an authorized representative of the Director, may, subject to the safety requirements of the permittee and without undue delay, enter upon the premises of this source at any reasonable time for purposes of making inspections, conducting tests, examining records or reports pertaining to any emission of air contaminants, and determining compliance with any applicable State and federal air pollution laws and regulations and the terms and conditions of this permit. The permittee shall furnish to the Director of the Ohio EPA, or an authorized representative of the Director, upon receipt of a written request and within a reasonable time, any information that may be requested to determine whether cause exists for modifying, reopening or revoking this permit or to determine compliance with this permit. Upon verbal or written request, the permittee shall also furnish to the Director of the Ohio EPA, or an

authorized representative of the Director, copies of records required to be kept by this permit

6. Scheduled Maintenance/Malfunction Reporting

Any scheduled maintenance of air pollution control equipment shall be performed in accordance with paragraph (A) of OAC rule 3745-15-06. The malfunction of any emissions unit or any associated air pollution control system(s) shall be reported to the appropriate Ohio EPA District Office or local air agency in accordance with paragraph (B) of OAC rule 3745-15-06. Except as provided in that rule, any scheduled maintenance or malfunction necessitating the shutdown or bypassing of any air pollution control system(s) shall be accompanied by the shutdown of this emissions unit(s) that is (are) served by such control system(s).

7. Permit Transfers

Any transferee of this permit shall assume the responsibilities of the prior permittee. The appropriate Ohio EPA District Office or local air agency must be notified in writing of any transfer of this permit.

8. Air Pollution Nuisance

The air contaminants emitted by the emissions units covered by this permit shall not cause a public nuisance, in violation of OAC rule 3745-15-07.

9. Permit Renewal

Approximately six months prior to the expiration date of this permit, a notice regarding the renewal of this permit will be sent to the permittee's designated facility contact. If you are not contacted, please contact the following Ohio EPA District Office or local air agency which has jurisdiction in the area in which the facility is located:

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It is the permittee's responsibility to renew this permit even if no notice of its expiration is received.

Part II: Special Terms and Conditions

A. Applicable Emissions Limitations and/or Control Requirements

1. The specific operation(s), property, and/or equipment which constitute this emissions unit are listed in the following table along with the applicable rules and/or requirements and with the applicable emissions limitations and/or control measures. Emissions from this unit shall not exceed the listed limitations, and the listed control measures shall be employed. Additional applicable emissions limitations and/or control measures (if any) may be specified in narrative form following the table.

<u>Operations, Property, and/or Equipment</u>	<u>Applicable Rules/ Requirements</u>	<u>Applicable Emissions Limitations/Control Measures</u>
Waste Digester Gas Flare Burner #3	OACrule 3745-31-05(A)(3)	Visible particulate emissions shall not exceed 5% opacity, as a six-minute average.
	OAC rule 3745-17-07(A)	The emission limitation specified by this rule is less stringent than the emission limitation established pursuant to OAC rule 3745-31-05(A)(3).
	OAC rule 3745-35-07(B)(2)	See A.2.a - A.2.d

2. Additional Terms and Conditions

- 2.a The emissions of sulfur dioxide (SO₂) from emissions units P002, P003, P004, B004, B005, B006, B007, B008, and B009, combined, shall not exceed 99.0 tons/year, based on a rolling, 365-day summation.
- 2.b The emissions of carbon monoxide (CO) from emissions units P002, P003, P004, B004, B005, B006, B007, B008, and B009, combined, shall not exceed 99.0 tons/year, based on a rolling, 365-day summation.
- 2.c The emissions of carbon monoxide (CO) from emissions units P002, P003, P004 combined, shall not exceed 84.0 tons/year, based on a rolling, 365-day summation.
- 2.d The emissions of nitrogen oxides (NO_x) from emissions units P002, P003, P004, B004, B005, B006, B007, B008, and B009, combined, shall not exceed 83.0 tons/year, based on a rolling, 365-day summation.

B. Operational Restrictions

1. The permittee shall burn only digester gas in this emissions unit
2. The maximum amount of digester gas burned in emissions units P002, P003, P004, B004, B005, B006, B007, B008, and B009, combined, shall not exceed 2,800,000 cubic feet/day.
3. The maximum amount of digester gas burned in emissions units P002, P003, and P004, combined, shall not exceed 730,000,000 cubic feet/year, based on a rolling 365-day summation.
4. The hydrogen sulfide content of the digester gas shall not exceed 1007 ppm, as fired. See Section C.2.

C. Monitoring and/or Record Keeping Requirements

1. The permittee shall determine daily the CO₂ content of the digester gas by the use of the Bacharach Fyrite Gas analyzer test method. The Btu/ft³ and density values shall be calculated daily by using the percentage of CO₂ in the digester gas and assuming the remainder of the digester gas is methane. The Btu/ft³ of CO₂ is zero, and the Btu/ft³ of methane is assumed to be 1000 Btu/ft³.

The Btu content of the digester gas shall be calculated by the following equation:

$$\text{Btu/ft}^3 \text{ digester gas} = (\% \text{ CO}_2 \text{ in digester gas})(0 \text{ Btu/ft}^3) + (1 - \% \text{ CO}_2 \text{ in digester gas})(1000 \text{ Btu/ft}^3)$$

The density of the digester gas shall be calculated by the following equation:

$$\text{Density of digester gas} = (\% \text{ CO}_2 \text{ in digester gas})(0.1225 \text{ lb/ft}^3) + (1 - \% \text{ CO}_2 \text{ in digester gas})(0.0446 \text{ lb/ft}^3)$$

*0.1225 lb/ft³ is the density of CO₂
0.0446 lb/ft³ is the density of methane

As a quality control check to determine the accuracy of the Bacharach Fyrite Gas analyzer test method, within 30 days of issuance of this permit and every six months thereafter, the permittee shall collect a grab sample of digester gas to be burned. The samples shall be analyzed in accordance with the appropriate ASTM methods to determine the heat content, in Btu per standard cubic foot, and the density, in lbs/standard cubic foot. If determined necessary by the RAPCA, more frequent testing in accordance with ASTM methods will be required.

2. The permittee shall monitor hydrogen sulfide, within 3 days of issuance of this permit and every 3 days thereafter, by using the Drager or Gastec tubes detection methods. The reliability rating of the Drager or Gastec tubes is +/- 25%. Therefore, to ensure compliance with a hydrogen sulfide concentration of 1007 ppm, hydrogen sulfide readings on the Drager or Gastec tube shall not exceed 806 ppm.

The permittee shall maintain records of all data obtained from the hydrogen sulfide monitoring including, but not limited to, parts per million hydrogen sulfide determined during each test and a record of the daily amount of metal salt added into the anaerobic digester system. The hydrogen sulfide concentrations shall be used to determine the decimal fractions of sulfur for determining compliance with the sulfur dioxide emission limitation. Each measured hydrogen sulfide concentration shall be considered to be the average hydrogen sulfide concentration for the measurement day and for each of the two days thereafter (if no additional measurements are taken during the following two days).

C. Monitoring and/or Record Keeping Requirements (continued)

3. The permittee shall collect and record the following information on a daily basis:
 - a. The total quantity of digester gas burned, in cubic feet in emissions units P002, P003, and P004, combined, as a 365-day summation.
 - b. The total quantity of digester gas burned, in cubic feet, in emissions units P002, P003, P004, B004, B005, B006, B007, B008, and B009, combined, as a 365-day summation.
 - c. The average decimal fraction of sulfur in the digester gas, by weight
 - d. The calculated heat content of the digester gas, in Btu per standard cubic foot
 - e. The calculated density of digester gas, in lb per standard cubic feet
 - f. The rolling, 365-day summation of the sulfur dioxide emission rate, in tons, for emissions units P002, P003, P004, B004, B005, B006, B007, B008, and B009, combined, calculated based upon the methodology specified in E.1.b.
 - g. The rolling, 365-day summation of the CO emission rate, in tons, from emissions units P002, P003, and P004 combined, based upon the methodology specified in Section E.1.d.
 - h. The rolling, 365-day summation of the CO emission rate, in tons, calculated based upon the methodology specified Section E.1.e, from emissions units P002, P003, P004, B004, B005, B006, B007, B008, and B009, combined.
 - i. The rolling 365-day summation of the NOx emission rate, in tons, calculated based upon the methodology outlined in Section E.1.c, from emissions units P002, P003, P004, B004, B005, B006, B007, B008, and B009, combined.
4. Within 180 days of the effective date of this permit, the permittee shall develop a written quality assurance/quality control plan for the continuous hydrogen sulfide monitoring system designed to ensure continuous valid and representative readings of hydrogen sulfide. The quality assurance/quality control plan and a logbook dedicated to the continuous hydrogen sulfide monitoring system must be kept on site and be available for inspection during regular office hours.

D. Reporting Requirements

1. The permittee shall submit deviation (excursion) reports that identify each day when a fuel other than digester gas was burned in this emissions unit.
2. The permittee shall submit quarterly deviation (excursion) reports which identify all exceedances of the following limitations:
 - a. The rolling, 365-day usage of digester gas, in cubic feet, in emissions units P002, P003, and P004, combined (reference B.3.).
 - b. The daily usage of digester gas, in cubic feet, in emissions units P002, P003, P004, B004, B005, B006, B007, B008, and B009, combined (reference B.2.).
 - c. The rolling, 365-day sulfur dioxide emissions (refer to Section A.2.a).
 - d. The rolling, 365-day CO emissions (refer to Section A.2.c).
 - e. The rolling, 365-day CO emissions for all emissions units, combined (refer to Section A.2.b).
 - f. The rolling, 365-day NOx emissions (refer to Section A.2.d).

These quarterly deviation (excursion) reports shall be submitted in accordance with paragraph (3) of the General Terms and Conditions.

3. The permittee shall submit annual reports which specify the total digester gas usage for emissions units P002, P003, and P004, combined, and the total digester gas usage and the total carbon monoxide, sulfur dioxide, and nitrogen oxides emissions for emissions units B004, B005, B006, B007, B008, B009, P002, P003, and P004, combined. These reports shall be submitted by January 31 of each year.

E. Testing Requirements

- 1.a** Emission Limitation-
5% opacity visible emission limitation, as a six-minute average

Applicable compliance Method-

Compliance shall be determined by visible emission evaluations performed in accordance with OAC rule 3745-17-03(B)(1) using the methods and procedures specified in USEPA Reference Method 9.

- 1.b** Emission Limitation-
99.0 tons/year SO₂ emissions for P002, P003, P004, B004, B005, B006, B007, B008, and B009, combined, as a rolling, 365-day summation

Applicable Compliance Method-

Compliance shall be determined by use of the formula for gaseous fuels in OAC rule 3745-18-04(F)(3)

$$ER = (1 \times 10^6) / H \times D \times S \times 1.998$$

where: ER = the emission rate, in pounds of sulfur dioxide per mmBtu;
H = the heat content of the gaseous fuel, in Btu per standard cubic foot;
D = the density of the gaseous fuel, in pounds per standard cubic foot; and
S = the decimal fraction of sulfur in the gaseous fuel, by weight.*

The daily SO₂ emissions are calculated using the following equation:

$$SO_2 \text{ (tons/day)} = ER \text{ (lbs/mmBtu)} \times \text{Gas Consumption (cu.ft/day)} \times (\text{Btu/cu.ft}) / 2000 \text{ lbs/ton}$$

The rolling, 365-day summation is the sum of the daily SO₂ emission rates for the 365-day period. (The SO₂ emissions from the combustion of natural gas is assumed to be negligible in comparison to the emissions from the digester gas.)

*The Dräger or Gastic tubes read in ppm, by volume. To convert to ppm by weight, multiply by the following ratio: density of H₂S/density of digester gas. The density of H₂S is equal to 0.08672 lb/ft³.

E. Testing Requirements (continued)

- 1.c** Emission Limitation-
83.0 tons/year NO_x for P002, P003, P004, B004, B005, B006, B007, B008, and B009 combined, as a rolling, 365-day summation

Applicable Compliance Method-

Compliance shall be determined by the calculation of the rolling 365-day emissions for all emissions units, as determined by the following methodology:

- i. multiply the cubic feet of digester gas burned (cubic feet/day) in emissions units P002, P003, and P004 by the heat value of digester gas as determined in C.1;
- ii. determine the NO_x emissions from P002, P003, and P004 by multiplying the product in (i) by the emission factor in AP-42 Chapter 13.5-1(9/91) of 0.068 lb NO_x/mmBtu.;
- iii. multiply the cubic feet of digester gas burned (cubic feet/day) in emissions units B004, B005, and B006 by the heat value of the digester gas as determined in C.1;
- iv. multiply the cubic feet of natural gas burned (cubic feet/day) in emissions units B004, B005, and B006 by the average heat value of natural gas (1000 Btu/cu.ft.);
- v. sum (iii) and (iv);
- vi. determine the NO_x emissions from B004, B005, and B006 by multiplying (v) by the emission factor in AP-42 Chapter 1.4-1(7/98) of 0.98 lb/mmBtu;
- vii. multiply the cubic feet of digester gas burned (cubic feet/day) in emissions units B007, B008, and B009 by the heat value of digester gas as determined in C.1;
- viii. multiply the cubic feet of natural gas burned (cubic feet/day) in emissions units B007, B008, and B009 by the average heat value of natural gas (1000 Btu/cu.ft.);
- ix. sum (vii) and (viii);
- x. determine the NO_x emissions from B007, B008, and B009 by multiplying (ix) by the emission factor in AP-42 Chapter 3.1-1(4/00) of 0.16 lb/mmBtu;
- xi. sum the results from (ii), (vi), and (x);
- xii. sum the results from (xi) for the 365-day period; and
- xiii. divide (xii) by 2000 lbs/ton.

- 1.d** Emission Limitation-
84.0 TPY CO, as a rolling 365-day summation, from emissions units P002, P003, and P004

Applicable Compliance Method-

Compliance shall be determined by the calculation of the rolling 365-day emissions for emissions units P002, P003, and P004 as determined by the following methodology:

- i. multiply the cubic feet of digester gas burned (cubic feet/day) in emissions units P002, P003, and P004 by the heat value of digester gas as determined in C.1;
- ii. multiply the product in (i) by the emission factor in AP-42 Chapter 13.5-1(9/91) of 0.37 lb CO/mmBtu.;
- iii. divide the product in (ii) by 2000 lbs/ton.

E. Testing Requirements (continued)

- 1.e** Emission Limitation-
99.0 tons/year CO for P002, P003, P004, B004, B005, B006, B007, B008, and B009, combined, as a rolling, 365-day summation

Applicable Compliance Method-

Compliance shall be determined by the calculation of the rolling 365-day emissions for all emissions units, as determined by the following methodology.

- i. multiply the cubic feet of digester gas burned (cubic feet/day) in emissions units P002, P003, and P004 by the heat value of digester gas as determined in C.1;
- ii. determine the CO emissions from P002, P003, and P004 by multiplying the product in (i) by the emission factor in AP-42 Chapter 13.5-1(9/91) of 0.37 lb CO/mmBtu.;
- iii. multiply the cubic feet of digester gas burned (cubic feet/day) in emissions units B004, B005, and B006 by the heat value of the digester gas as determined in C.1;
- iv. multiply the cubic feet of natural gas burned (cubic feet/day) in emissions units B004, B005, and B006 by the average heat value of natural gas (1000 Btu/cu.ft.);
- v. sum (iii) and (iv);
- vi. determine the CO emissions from B004, B005, and B006 by multiplying (v) by the emission factor in AP-42 Chapter 1.4-1(7/98) of 0.084 lb/mmBtu;
- vii. multiply the cubic feet of digester gas burned (cubic feet/day) in emissions units B007, B008, and B009 by the heat value of the digester gas as determined in C.1;
- viii. multiply the cubic feet of natural gas burned (cubic feet/day) in emissions units B007, B008, and B009 by the heat value of the natural gas (1000 Btu/cu.ft.);
- ix. sum (vii) and (viii);
- x. determine the CO emissions from B007, B008, and B009 by multiplying (ix) by the emission factor in AP-42 Chapter 3.1-1(4/00) of 0.017 lbmmBtu;
- xi. sum the results from (ii), (vi), and (x); and
- xii. sum the results from (xi) for the 365-day period; and
- xiii. divide (xii) by 2000 lbs/ton.

F. Miscellaneous Requirements

1. In accordance with OAC rule 3745-35-07, the following sections of this permit are federally enforceable: A - F.



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08/13/01

CERTIFIED MAIL

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Waste Digester Gas Flare Burner

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Division of Air Pollution Control

cc: RAPCA



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Dayton, OH 45418

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OHIO ENVIRONMENTAL PROTECTION AGENCY

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Christopher Jones
Director

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Part II: Special Terms and Conditions

A. Applicable Emissions Limitations and/or Control Requirements

1. The specific operation(s), property, and/or equipment which constitute this emissions unit are listed in the following table along with the applicable rules and/or requirements and with the applicable emissions limitations and/or control measures. Emissions from this unit shall not exceed the listed limitations, and the listed control measures shall be employed. Additional applicable emissions limitations and/or control measures (if any) may be specified in narrative form following the table.

<u>Operations, Property, and/or Equipment</u>	<u>Applicable Rules/ Requirements</u>	<u>Applicable Emissions Limitations/Control Measures</u>
Waste Digester Gas Flare Burner #2	OAC rule 3745-31-05(A)(3)	Visible particulate emissions shall not exceed 5% opacity, as a six-minute average.
	OAC rule 3745-17-07(A)	The emission limitation specified by this rule is less stringent than the emission limitation established pursuant to OAC rule 3745-31-05(A)(3).
	OAC rule 3745-35-07(B)(2)	See A.2.a - A.2.d

2. Additional Terms and Conditions

- 2.a The emissions of sulfur dioxide (SO₂) from emissions units P002, P003, P004, B004, B005, B006, B007, B008, and B009, combined, shall not exceed 99.0 tons/year, based on a rolling, 365 day summation.
- 2.b The emissions of carbon monoxide (CO) from emissions units P002, P003, P004, B004, B005, B006, B007, B008, and B009, combined, shall not exceed 99.0 tons/year, based on a rolling, 365-day summation.
- 2.c The emissions of carbon monoxide (CO) from emissions units P002, P003, P004, combined, shall not exceed 84.0 tons/year, based on a rolling, 365-day summation.
- 2.d The emissions of nitrogen oxides (NO_x) from emissions units P002, P003, P004, B004, B005, B006, B007, B008, and B009, combined, shall not exceed 83.0 tons/year, based on a rolling, 365-day summation.

B. Operational Restrictions

1. The permittee shall burn only digester gas in this emissions unit.
2. The maximum amount of digester gas burned in emissions units P002, P003, P004, B004, B005, B006, B007, B008, and B009, combined, shall not exceed 2,800,000 cubic feet/day.
3. The maximum amount of digester gas burned in emissions units P002, P003, and P004, combined, shall not exceed 730,000,000 cubic feet/year, based on a rolling 365-day summation.
4. The hydrogen sulfide content of the digester gas shall not exceed 1007 ppm, as fired. See Section C.2.

C. Monitoring and/or Record Keeping Requirements

1. The permittee shall determine daily the CO₂ content of the digester gas by the use of the Bacharach Fyrite Gas analyzer test method. The Btu/ft³ and density values shall be calculated daily by using the percentage of CO₂ in the digester gas and assuming the remainder of the digester gas is methane. The Btu/ft³ of CO₂ is zero, and the Btu/ft³ of methane is assumed to be 1000 Btu/ft³.

The Btu content of the digester gas shall be calculated by the following equation:

$$\text{Btu/ft}^3 \text{ digester gas} = (\% \text{ CO}_2 \text{ in digester gas})(0 \text{ Btu/ft}^3) + (1 - \% \text{ CO}_2 \text{ in digester gas})(1000 \text{ Btu/ft}^3)$$

The density of the digester gas shall be calculated by the following equation:

$$\text{Density of digester gas} = (\% \text{ CO}_2 \text{ in digester gas})(0.1225 \text{ lb/ft}^3) + (1 - \% \text{ CO}_2 \text{ in digester gas})(0.0446 \text{ lb/ft}^3)$$

*0.1225 lb/ft³ is the density of CO₂
0.0446 lb/ft³ is the density of methane

As a quality control check to determine the accuracy of the Bacharach Fyrite Gas analyzer test method, within 30 days of issuance of this permit and every six months thereafter, the permittee shall collect a grab sample of digester gas to be burned. The samples shall be analyzed in accordance with the appropriate ASTM methods to determine the heat content, in Btu per standard cubic foot, and the density, in lbs/standard cubic foot. If determined necessary by the RAPCA, more frequent testing in accordance with ASTM methods will be required.

2. The permittee shall monitor hydrogen sulfide, within 3 days of issuance of this permit and every 3 days thereafter, by using the Drager or Gastec tubes detection methods. The reliability rating of the Drager or Gastec tubes is +/- 25%. Therefore, to ensure compliance with a hydrogen sulfide concentration of 1007 ppm hydrogen sulfide readings on the Drager or Gastec tube shall not exceed 806 ppm.

The permittee shall maintain records of all data obtained from the hydrogen sulfide monitoring including, but not limited to, parts per million hydrogen sulfide determined during each test and a record of the daily amount of metal salt added into the anaerobic digester system. The hydrogen sulfide concentrations shall be used to determine the decimal fractions of sulfur for determining compliance with the sulfur dioxide emission limitation. Each measured hydrogen sulfide concentration shall be considered to be the average hydrogen sulfide concentration for the measurement day and for each of the two days thereafter (if no additional measurements are taken during the following two days).

C. Monitoring and/or Record Keeping Requirements (continued)

3. The permittee shall collect and record the following information on a daily basis:
 - a. The total quantity of digester gas burned, in cubic feet in emissions units P002, P003, and P004, combined as a 365-day summation.
 - b. The total quantity of digester gas burned, in cubic feet, in emissions units P002, P003, P004, B004, B005, B006, B007, B008, and B009, combined, as a 365-day summation.
 - c. The average decimal fraction of sulfur in the digester gas, by weight
 - d. The calculated heat content of the digester gas, in Btu per standard cubic foot
 - e. The calculated density of digester gas, in lb per standard cubic feet.
 - f. The rolling, 365-day summation of the sulfur dioxide emission rate, in tons, for emissions units P002, P003, P004, B004, B005, B006, B007, B008, and B009, combined, calculated based upon the methodology specified in E.1.b.
 - g. The rolling, 365-day summation of the CO emission rate, in tons, from emissions units P002, P003, and P004 combined, based upon the methodology specified in Section E.1.d.
 - h. The rolling, 365-day summation of the CO emission rate, in tons, calculated based upon the methodology specified Section E.1.e, from emissions units P002, P003, P004, B004, B005, B006, B007, B008, and B009, combined.
 - i. The rolling 365-day summation of the NOx emission rate, in tons, calculated based upon the methodology outlined in Section E.1.c, from emissions units P002, P003, P004, B004, B005, B006, B007, B008, and B009, combined.
4. Within 180 days of the effective date of this permit, the permittee shall develop a written quality assurance/quality control plan for the continuous hydrogen sulfide monitoring system designed to ensure continuous valid and representative readings of hydrogen sulfide. The quality assurance/quality control plan and a logbook dedicated to the continuous hydrogen sulfide monitoring system must be kept on site and be available for inspection during regular office hours.

D. Reporting Requirements

1. The permittee shall submit deviation (excursion) reports that identify each day when a fuel other than digester gas was burned in this emissions unit.
2. The permittee shall submit quarterly deviation (excursion) reports which identify all exceedances of the following limitations:
 - a. The rolling, 365-day usage of digester gas, in cubic feet, in emissions units P002, P003, and P004, combined (reference B.3.).
 - b. The daily usage of digester gas, in cubic feet, in emissions units P002, P003, P004, B004, B005, B006, B007, B008, and B009, combined (reference B.2.).
 - c. The rolling, 365-day sulfur dioxide emissions (refer to Section A.2.a).
 - d. The rolling, 365-day CO emissions (refer to Section A.2.c).
 - e. The rolling, 365-day CO emissions for all emissions units, combined (refer to Section A.2.b).
 - f. The rolling, 365-day NOx emissions (refer to Section A.2.d).

These quarterly deviation (excursion) reports shall be submitted in accordance with paragraph (3) of the General Terms and Conditions.

3. The permittee shall submit annual reports which specify the total digester gas usage for emissions units P002, P003, and P004, combined, and the total digester gas usage and the total carbon monoxide, sulfur dioxide, and nitrogen oxides emissions for emissions units B004, B005, B006, B007, B008, B009, P002, P003, and P004, combined. These reports shall be submitted by January 31 of each year.

E. Testing Requirements

- 1.a Emission Limitation-
5% opacity visible emission limitation, as a six-minute average

Applicable compliance Method-

Compliance shall be determined by visible emission evaluations performed in accordance with OAC rule 3745-17-03(B)(1) using the methods and procedures specified in USEPA Reference Method 9.

- 1.b Emission Limitation-
99.0 tons/year SO₂ emissions for P002, P003, P004, B004, B005, B006, B007, B008, and B009, combined, as a rolling, 365-day summation

Applicable Compliance Method-

Compliance shall be determined by use of the formula for gaseous fuels in OAC rule 3745-18-04(F)(3)

$$ER = (1 \times 10^6) / H \times D \times S \times 1.998$$

where: ER = the emission rate, in pounds of sulfur dioxide per mmBtu;
H = the heat content of the gaseous fuel, in Btu per standard cubic foot;
D = the density of the gaseous fuel, in pounds per standard cubic foot; and
S = the decimal fraction of sulfur in the gaseous fuel, by weight.*

The daily SO₂ emissions are calculated using the following equation.

$$SO_2 \text{ (tons/day)} = ER \text{ (lbs/mmBtu)} \times \text{Gas Consumption (cu.ft/day)} \times (\text{Btu/cu.ft}) / 2000 \text{ lbs/ton}$$

The rolling, 365-day summation is the sum of the daily SO₂ emission rates for the 365-day period. (The SO₂ emissions from the combustion of natural gas is assumed to be negligible in comparison to the emissions from the digester gas.)

*The Dräger or Gastic tubes read in ppm, by volume. To convert to ppm by weight, multiply by the following ratio: density of H₂S/density of digester gas. The density of H₂S is equal to 0.08674 lb/ft³.

E. Testing Requirements (continued)

- 1.c Emission Limitation-**
83.0 tons/year NO_x for P002, P003, P004, B004, B005, B006, B007, B008, and B009 combined, as a rolling, 365-day summation

Applicable Compliance Method-

Compliance shall be determined by the calculation of the rolling 365-day emissions for all emissions units, as determined by the following methodology:

- i. multiply the cubic feet of digester gas burned (cubic feet/day) in emissions units P002, P003, and P004 by the heat value of digester gas as determined in C.1;
- ii. determine the NO_x emissions from P002, P003, and P004 by multiplying the product in (i) by the emission factor in AP-42 Chapter 13.5-1(9/91) of 0.068 lb NO_x/mmBtu.;
- iii. multiply the cubic feet of digester gas burned (cubic feet/day) in emissions units B004, B005, and B006 by the heat value of the digester gas as determined in C.1;
- iv. multiply the cubic feet of natural gas burned (cubic feet/day) in emissions units B004, B005, and B006 by the average heat value of natural gas (1000 Btu/cu.ft.);
- v. sum (iii) and (iv);
- vi. determine the NO_x emissions from B004, B005, and B006 by multiplying (v) by the emission factor in AP-42 Chapter 1.4-1(7/98) of 0.98 lb/mmBtu;
- vii. multiply the cubic feet of digester gas burned (cubic feet/day) in emissions units B007, B008, and B009 by the heat value of digester gas as determined in C.1;
- viii. multiply the cubic feet of natural gas burned (cubic feet/day) in emissions units B007, B008, and B009 by the average heat value of natural gas (1000 mmBtu/cu.ft.);
- ix. sum (vii) and (viii);
- x. determine the NO_x emissions from B007, B008, and B009 by multiplying (ix) by the emission factor in AP-42 Chapter 3.1-1(4/00) of 0.16 lb/mmBtu;
- xi. sum the results from (ii), (vi), and (x);
- xii. sum the results from (xi) for the 365-day period; and
- xiii. divide (xii) by 2000 lbs/ton.

- 1.d Emission Limitation-**
84.0 TPY CO, as a rolling 365-day summation, from emissions units P002, P003, and P004

Applicable Compliance Method-

Compliance shall be determined by the calculation of the rolling 365-day emissions for emissions units P002, P003, and P004 as determined by the following methodology:

- i. multiply the cubic feet of digester gas burned (cubic feet/day) in emissions units P002, P003, and P004 by the heat value of digester gas as determined in C.1;
- ii. multiply the product in (i) by the emission factor in AP-42 Chapter 13.5-1(9/91) of 0.37 lb CO/mmBtu.;
- iii. divide the product in (ii) by 2000 lbs/ton.

E. Testing Requirements (continued)

- 1.e Emission Limitation-
99.0 tons/year CO for P002, P003, P004, B004, B005, B006, B007, B008, and B009, combined, as a rolling, 365-day summation

Applicable Compliance Method-

Compliance shall be determined by the calculation of the rolling 365-day emissions for all emissions units, as determined by the following methodology.

- i. multiply the cubic feet of digester gas burned (cubic feet/day) in emissions units P002, P003, and P004 by the heat value of digester gas as determined in C.1;
- ii. determine the CO emissions from P002, P003, and P004 by multiplying the product in (i) by the emission factor in AP-42 Chapter 13.5-1(9/91) of 0.37 lb CO/mmBtu.;
- iii. multiply the cubic feet of digester gas burned (cubic feet/day) in emissions units B004, B005, and B006 by the heat value of the digester gas as determined in C.1;
- iv. multiply the cubic feet of natural gas burned (cubic feet/day) in emissions units B004, B005, and B006 by the average heat value of natural gas (1000 Btu/cu.ft.);
- v. sum (iii) and (iv);
- vi. determine the CO emissions from B004, B005, and B006 by multiplying (v) by the emission factor in AP-42 Chapter 1.4-1(7/98) of 0.084 lb/mmBtu;
- vii. multiply the cubic feet of digester gas burned (cubic feet/day) in emissions units B007, B008, and B009 by the heat value of the digester gas as determined in C.1;
- viii. multiply the cubic feet of natural gas burned (cubic feet/day) in emissions units B007, B008, and B009 by the average heat value of the natural gas (1000 mmBtu/cu.ft.);
- ix. sum (vii) and (viii);
- x. determine the CO emissions from B007, B008, and B009 by multiplying (ix) by the emission factor in AP-42 Chapter 3.1-1(4/00) of 0.017 lbmmBtu;
- xi. sum the results from (ii), (vi), and (x); and
- xii. sum the results from (xi) for the 365-day period; and
- xiii. divide (xii) by 2000 lbs/ton.

F. Miscellaneous Requirements

1. In accordance with OAC rule 3745-35-07, the following sections of this permit are federally enforceable: A - F



State of Ohio Environmental Protection Agency

Street Address:

TELE: (614) 644-3020 FAX: (614) 644-2329

Mailing Address:

Lazarus Gov. Center
P.O. Box 1049
Columbus, OH 43216-1049

08/13/01

CERTIFIED MAIL

RE: Final Chapter 3745-35 Permit To Operate

P002 (Flare Burner #1)

Waste Digester Gas Flare Burner

City of Dayton Wastewater Treatment Plant (08-57-10-0983)

Thomas Schommer
2800 Guthrie Road
Dayton, OH 45418

Dear Thomas Schommer:

The enclosed Permit(s) to Operate allow you to operate the described emissions unit(s) in the manner indicated in the Permit(s). Because each permit contains several terms and conditions, I urge you to read them carefully.

The Ohio EPA is urging companies to investigate pollution prevention and energy conservation. Not only will this reduce pollution and energy consumption, but it can also save you money. If you would like to learn ways you can save money while protecting the environment, please contact our Office of Pollution Prevention at (614) 644-3469.

You are hereby notified that this action of the Director is final and may be appealed to the Environmental Review Appeals Commission pursuant to Section 3745.04 of the Ohio Revised Code. The appeal must be in writing and set forth the action complained of and the grounds upon which the appeal is based. It must be filed with the Environmental Review Appeals Commission within thirty (30) days after notice of the Director's action. A copy of the appeal must be served on the Director of the Ohio Environmental Protection Agency within three (3) days of filing with the Commission. It is also requested by the Director that a copy of the appeal be served upon the Environmental Enforcement Section of the Office of the Attorney General. An appeal may be filed with the Environmental Review Appeals Commission at the following address:

Environmental Review Appeals Commission
236 East Town Street
Room 300
Columbus, Ohio 43215

If you have any questions, please contact the RAPCA at (937) 225-4435.

Very truly yours,

Thomas G. Rigo, Manager
Field Operations and Permit Section
Division of Air Pollution Control

cc: RAPCA



State of Ohio Environmental Protection Agency

Final Permit To Operate An Emissions Unit

Effective Date: 08/13/01

Expiration Date: 08/13/06

This document constitutes issuance to:

Facility ID: 08-57-10-0983
City of Dayton Wastewater Treatment Plant
2800 Guthrie Rd.
Dayton, OH 45418

of a permit to operate for:

P002 (Flare Burner #1)
Waste Digester Gas Flare Burner

You will be contacted six months prior to the expiration date regarding the renewal of this permit. If you are not contacted, please contact the appropriate Ohio EPA District Office or local air agency identified below. This permit and the authorization to operate the air contaminant source (emissions unit) at this facility shall expire at midnight on the expiration date shown above. If a renewal permit is not issued prior to the expiration date, the permittee may continue to operate pursuant to OAC Chapter 3745-35 and in accordance with the terms of this permit beyond the expiration date, provided that a complete renewal application is submitted no earlier than eighteen (18) months and no later than one-hundred eighty (180) days prior to the expiration date.

Described below is the Ohio EPA District Office or local air agency that is responsible for processing and administering your Title V permit:

RAPCA
451 West Third Street
PO Box 972
Dayton, OH 45422
(937) 225-4435

This permit is granted subject to the conditions attached hereto.

OHIO ENVIRONMENTAL PROTECTION AGENCY

A handwritten signature in cursive script, appearing to read "Christopher Jones", written over a horizontal line.

Christopher Jones
Director

Part I: General Terms and Conditions

1. Compliance Requirements

The above-described emissions unit is and shall remain in full compliance with all applicable State and federal laws and regulations and the terms and conditions of this permit.

2. Permit to Install Requirement

Prior to the "installation" or "modification" of any "air contaminant source," as those terms are defined in OAC rule 3745-31-01, a permit to install must be obtained from the Ohio EPA pursuant to OAC Chapter 3745-31.

3. Reporting Requirements Related to Monitoring and Recordkeeping Requirements

The permittee shall submit required reports in the following manner:

- a. Reports of any required monitoring and/or recordkeeping information shall be submitted to the appropriate Ohio EPA District Office or local air agency.
- b. Except as otherwise may be provided in the terms and conditions for a specific emissions unit, quarterly written reports of (a) any deviations (excursions) from emission limitations, operational restrictions, and control device operating parameter limitations that have been detected by the testing, monitoring, and recordkeeping requirements specified in this permit, (b) the probable cause of such deviations, and (c) any corrective actions or preventive measures which have been or will be taken, shall be submitted to the appropriate Ohio EPA District Office or local air agency. If no deviations occurred during a calendar quarter, the permittee shall submit a quarterly report, which states that no deviations occurred during that quarter. The reports shall be submitted quarterly, i.e., by January 31, April 30, July 31, and October 31 of each year and shall cover the previous calendar quarters. (These quarterly reports shall exclude deviations resulting from malfunctions reported in accordance with OAC rule 3745-15-06.)

4. Records Retention Requirements

Each record of any monitoring data, testing data, and support information required pursuant to this permit shall be retained for a period of five years from the date the record was created. Support information shall include, but not be limited to, all calibration and maintenance records and all original strip-chart recordings for continuous monitoring instrumentation, and copies of all reports required by the permit. Such records may be maintained in computerized form.

5. Inspections and Information Requests

The Director of the Ohio EPA, or an authorized representative of the Director, may, subject to the safety requirements of the permittee and without undue delay, enter upon the premises of this source at any reasonable time for purposes of making inspections, conducting tests, examining records or reports pertaining to any emission of air contaminants, and determining compliance with any applicable State and federal air pollution laws and regulations and the terms and conditions of this permit. The permittee shall furnish to the Director of the Ohio EPA, or an authorized representative of the Director, upon receipt of a written request and within a reasonable time, any information that may be requested to determine whether cause exists for modifying, reopening or revoking this permit or to determine compliance with this permit. Upon verbal or written request, the permittee shall also furnish to the Director of the Ohio EPA, or an

authorized representative of the Director, copies of records required to be kept by this permit.

6. Scheduled Maintenance/Malfunction Reporting

Any scheduled maintenance of air pollution control equipment shall be performed in accordance with paragraph (A) of OAC rule 3745-15-06. The malfunction of any emissions unit or any associated air pollution control system(s) shall be reported to the appropriate Ohio EPA District Office or local air agency in accordance with paragraph (B) of OAC rule 3745-15-06. Except as provided in that rule, any scheduled maintenance or malfunction necessitating the shutdown or bypassing of any air pollution control system(s) shall be accompanied by the shutdown of this emissions unit(s) that is (are) served by such control system(s).

7 Permit Transfers

Any transferee of this permit shall assume the responsibilities of the prior permittee. The appropriate Ohio EPA District Office or local air agency must be notified in writing of any transfer of this permit.

8. Air Pollution Nuisance

The air contaminants emitted by the emissions units covered by this permit shall not cause a public nuisance, in violation of OAC rule 3745-15-07.

9. Permit Renewal

Approximately six months prior to the expiration date of this permit, a notice regarding the renewal of this permit will be sent to the permittee's designated facility contact. If you are not contacted, please contact the following Ohio EPA District Office or local air agency which has jurisdiction in the area in which the facility is located:

**RAPCA
451 West Third Street
PO Box 972
Dayton, OH 45422
(937) 225-4435**

It is the permittee's responsibility to renew this permit even if no notice of its expiration is received

Part II: Special Terms and Conditions

A. Applicable Emissions Limitations and/or Control Requirements

1. The specific operation(s), property, and/or equipment which constitute this emissions unit are listed in the following table along with the applicable rules and/or requirements and with the applicable emissions limitations and/or control measures. Emissions from this unit shall not exceed the listed limitations, and the listed control measures shall be employed. Additional applicable emissions limitations and/or control measures (if any) may be specified in narrative form following the table.

<u>Operations, Property, and/or Equipment</u>	<u>Applicable Rules/ Requirements</u>	<u>Applicable Emissions Limitations/Control Measures</u>
Waste Digester Gas Flare Burner #1	OAC rule 3745-31-05(A)(3)	Visible particulate emissions shall not exceed 5% opacity, as a six-minute average.
	OAC rule 3745-17-07(A)	The emission limitation specified by this rule is less stringent than the emission limitation established pursuant to OAC rule 3745-31-05(A)(3).
	OAC rule 3745-35-07(B)(2)	See A.2.a - A.2.d

2. Additional Terms and Conditions

- 2.a The emissions of sulfur dioxide (SO₂) from emissions units P002, P003, P004, B004, B005, B006, B007, B008, and B009, combined, shall not exceed 99.0 tons/year, based on a rolling, 365-day summation.
 The emissions of carbon monoxide (CO) from emissions units P002, P003, P004, B004, B005, B006, B007, B008, and B009, combined, shall not exceed 99.0 tons/year, based on a rolling, 365-day summation.
- 2.c The emissions of carbon monoxide (CO) from emissions units P002, P003, P004, combined, shall not exceed 84.0 tons/year, based on a rolling, 365-day summation.
 The emissions of nitrogen oxides (NO_x) from emissions units P002, P003, P004, B004, B005, B006, B007, B008, and B009, combined, shall not exceed 83.0 tons/year, based on a rolling, 365-day summation.

B. Operational Restrictions

1. The permittee shall burn only digester gas in this emissions unit
2. The maximum amount of digester gas burned in the emissions units P002, P003, P004, B004, B005, B006, B007, B008, and B009, combined, shall not exceed 2,800,000 cubic feet/day.
3. The maximum amount of digester gas burned in emissions units P002, P003, and P004, combined, shall not exceed 730,000,000 cubic feet/year, based on a 365-day rolling summation.
4. The hydrogen sulfide content of the digester gas shall not exceed 1007 ppm, as fired. See Section C.2.

C Monitoring and/or Record Keeping Requirements

1. The permittee shall determine daily the CO₂ content of the digester gas by the use of the Bacharach Fyrite Gas analyzer test method. The Btu/ft³ and density values shall be calculated daily by using the percentage of CO₂ in the digester gas and assuming the remainder of the digester gas is methane. The Btu/ft³ of CO₂ is zero, and the Btu/ft³ of methane is assumed to be 1000 Btu/ft³.

The Btu content of the digester gas shall be calculated by the following equation.

$$\text{Btu/ft}^3 \text{ digester gas} = (\% \text{ CO}_2 \text{ in digester gas})(0 \text{ Btu/ft}^3) + (1 - \% \text{ CO}_2 \text{ in digester gas})(1000 \text{ Btu/ft}^3).$$

The density of the digester gas shall be calculated by the following equation

$$\text{Density of digester gas} = (\% \text{ CO}_2 \text{ in digester gas})(0.1225 \text{ lb/ft}^3) + (1 - \% \text{ CO}_2 \text{ in digester gas})(0.0446 \text{ lb/ft}^3).$$

*0.1225 lb/ft³ is the density of CO₂

0.0446 lb/ft³ is the density of methane

As a quality control check to determine the accuracy of the Bacharach Fyrite Gas analyzer test method, within 30 days of issuance of this permit and every six months thereafter, the permittee shall collect a grab sample of digester gas to be burned. The samples shall be analyzed in accordance with the appropriate ASTM methods to determine the heat content, in Btu per standard cubic foot, and the density, in lbs/standard cubic foot. If determined necessary by the RAPCA, more frequent testing in accordance with ASTM methods will be required.

2. The permittee shall monitor hydrogen sulfide, within 3 days of issuance of this permit and every 3 days thereafter, by using the Drager or Gastec tubes detection methods. The reliability rating of the Drager or Gastec tubes is +/- 25%. Therefore, to ensure compliance with a hydrogen sulfide concentration of 1007 ppm, hydrogen sulfide readings on the Drager or Gastec tube shall not exceed 806 ppm.

The permittee shall maintain records of all data obtained from the hydrogen sulfide monitoring including, but not limited to, parts per million hydrogen sulfide determined during each test and a record of the daily amount of metal salt added into the anaerobic digester system. The hydrogen sulfide concentrations shall be used to determine the decimal fractions of sulfur for determining compliance with the sulfur dioxide emission limitation. Each measured hydrogen sulfide concentration shall be considered to be the average hydrogen sulfide concentration for the measurement day and for each of the two days thereafter (if no additional measurements are taken during the following two days).

C. Monitoring and/or Record Keeping Requirements (continued)

3. The permittee shall collect and record the following information on a daily basis:
 - a. The total quantity of digester gas burned, in cubic feet in emissions units P002, P003, and P004, combined, as a 365-day summation.
 - b. The total quantity of digester gas burned, in cubic feet, in emissions units P002, P003, P004, B004, B005, B006, B007, B008, and B009, combined, as a 365-day summation.
 - c. The average decimal fraction of sulfur in the digester gas, by weight.
 - d. The calculated heat content of the digester gas, in Btu per standard cubic foot.
 - e. The calculated density of the digester gas, in lb per standard cubic feet.
 - f. The rolling, 365-day summation of the sulfur dioxide emission rate, in tons, for emissions units P002, P003, P004, B004, B005, B006, B007, B008, and B009, combined, calculated based upon the methodology specified in E.1.b.
 - g. The rolling, 365-day summation of the CO emission rate, in tons, from emissions units P002, P003, and P004 combined, based upon the methodology specified in Section E.1.d.
 - h. The rolling, 365-day summation of the CO emission rate, in tons, calculated based upon the methodology specified Section E.1.c, from emissions units P002, P003, P004, B004, B005, B006, B007, B008, and B009, combined.
 - i. The rolling 365-day summation of the NOx emission rate, in tons, calculated based upon the methodology outlined in Section E.1.e, from emissions units P002, P003, P004, B004, B005, B006, B007, B008, and B009 combined.
4. Within 180 days of the effective date of this permit, the permittee shall develop a written quality assurance/quality control plan for the continuous hydrogen sulfide monitoring system designed to ensure continuous valid and representative readings of hydrogen sulfide. The quality assurance/quality control plan and a logbook dedicated to the continuous hydrogen sulfide monitoring system must be kept on site and be available for inspection during regular office hours.

D. Reporting Requirements

1. The permittee shall submit deviation (excursion) reports that identify each day when a fuel other than digester gas was burned in this emissions unit.
2. The permittee shall submit quarterly deviation (excursion) reports which identify all exceedances of the following limitations:
 - a. The rolling, 365-day usage of digester gas, in cubic feet, in emissions units P002, P003, and P004, combined (reference B.3.).
 - b. The daily usage of digester gas, in cubic feet, in emissions units P002, P003, P004, B004, B005, B006, B007, B008, and B009, combined (reference B.2.).
 - c. The rolling, 365-day sulfur dioxide emissions (refer to Section A.2.a).
 - d. The rolling, 365-day CO emissions (refer to Section A.2.c).
 - e. The rolling, 365-day CO emissions for all emissions units, combined (refer to Section A.2.b).
 - f. The rolling, 365-day NOx emissions (refer to Section A.2.d).

These quarterly deviation (excursion) reports shall be submitted in accordance with paragraph (3) of the General Terms and Conditions.
3. The permittee shall submit annual reports which specify the total digester gas usage for emissions units P002, P003, and P004, combined, and the total digester gas usage and the total carbon monoxide, sulfur dioxide, and nitrogen oxides emissions for emissions units B004, B005, B006, B007, B008, B009, P002, P003, and P004, combined. These reports shall be submitted by January 31 of each year.

E. Testing Requirements

- 1.a** Emission Limitation-
5% opacity visible emission limitation, as a six-minute average

Applicable compliance Method-

Compliance shall be determined by visible emission evaluations performed in accordance with OAC rule 3745-17-03(B)(1) using the methods and procedures specified in USEPA Reference Method 9.

- 1.b** Emission Limitation-
99.0 tons/year SO₂ emissions for P002, P003, P004, B004, B005, B006, B007, B008, and B009, combined, as a rolling, 365-day summation

Applicable Compliance Method-

Compliance shall be determined by use of the formula for gaseous fuels in OAC rule 3745-18-04(F)(3):

$$ER = (1 \times 10^6) / H \times D \times S \times 1.998$$

where: ER = the emission rate, in pounds of sulfur dioxide per mmBtu;
H = the heat content of the gaseous fuel, in Btu per standard cubic foot;
D = the density of the gaseous fuel, in pounds per standard cubic foot; and
S = the decimal fraction of sulfur in the gaseous fuel, by weight.*

The daily SO₂ emissions are calculated using the following equation

$$SO_2 \text{ (tons/day)} = ER \text{ (lbs/mmBtu)} \times \text{Gas Consumption (cu.ft/day)} \times \text{(Btu/cu.ft)} / 2000 \text{ lbs/ton}$$

The rolling, 365-day summation is the sum of the daily SO₂ emission rates for the 365-day period. The SO₂ emissions from the combustion of natural gas is assumed to be negligible in comparison to the emissions from the digester gas

*The Drager or Gastic tubes read in ppm, by volume. To convert to ppm by weight, multiply by the following ratio: density of H₂S/density of digester gas. The density of H₂S is equal to 0.08672 lb/ft³.

E. Testing Requirements (continued)

- 1.c Emission Limitation-**
99.0 tons/year CO for P002, P003, P004, B004, B005, B006, B007, B008, and B009, combined, as a rolling, 365-day summation

Applicable Compliance Method-

Compliance shall be determined by the calculation of the rolling 365-day emissions for all emissions units, as determined by the following methodology.

- i. multiply the cubic feet of digester gas burned (cubic feet/day) in emissions units P002, P003, and P004 by the heat value of digester gas as determined in C.1;
- ii. determine the CO emissions from P002, P003, and P004 by multiplying the product in (i) by the emission factor in AP-42 Chapter 13.5-1(9/91) of 0.37 lb CO/mmBtu.;
- iii. multiply the cubic feet of digester gas burned (cubic feet/day) in emissions units B004, B005, and B006 by the heat value of the digester gas as determined in C.1;
- iv. multiply the cubic feet of natural gas burned (cubic feet/day) in emissions units B004, B005, and B006 by the average heat value of natural gas (1000 Btu/cu.ft.);
- v. sum (iii) and (iv);
- vi. determine the CO emissions from B004, B005, and B006 by multiplying (v) by the emission factor in AP-42 Chapter 1.4-1(7/98) of 0.084 lb/mmBtu;
- vii. multiply the cubic feet of digester gas burned (cubic feet/day) in emissions units B007, B008, and B009 by the heat value of the digester gas as determined in C.1;
- viii. multiply the cubic feet of natural gas burned (cubic feet/day) in emissions units B007, B008, and B009 by the heat value of the natural gas (1000 Btu/cu.ft.);
- ix. sum (vii) and (viii);
- x. determine the CO emissions from B007, B008, and B009 by multiplying (ix) by the emission factor in AP-42 Chapter 3.1-1(4/00) of 0.017 lb/mmBtu;
- xi. sum the results from (ii), (vi), and (x); and
- xii. sum the results from (xi) for the 365-day period; and
- xiii. divide (xii) by 2000 lbs/ton.

- 1.d Emission Limitation-**
84.0 TPY CO, as a rolling 365-day summation, from emissions units P002, P003, and P004

Applicable Compliance Method-

Compliance shall be determined by the calculation of the rolling 365-day emissions for emissions units P002, P003, and P004 as determined by the following methodology:

- i. multiply the cubic feet of digester gas burned (cubic feet/day) in emissions units P002, P003, and P004 by the heat value of digester gas as determined in C.1;
- ii. multiply the product in (i) by the emission factor in AP-42 Chapter 13.5-1(9/91) of 0.37 lb CO/mmBtu.;
- iii. divide the product in (ii) by 2000 lbs/ton.

E. Testing Requirements (continued)

- 1.e** Emission Limitation-
83.0 tons/year NO_x for P002, P003, P004, B004, B005, B006, B007, B008, and B009 combined, as a rolling, 365-day summation

Applicable Compliance Method-

Compliance shall be determined by the calculation of the rolling 365-day emissions for all emissions units, as determined by the following methodology:

- i. multiply the cubic feet of digester gas burned (cubic feet/day) in emissions units P002, P003, and P004 by the heat value of digester gas as determined in C.1;
- ii. determine the NO_x emissions from P002, P003, and P004 by multiplying the product in (i) by the emission factor in AP-42 Chapter 13.5-1(9/91) of 0.068 lb NO_x/mmBtu.;
- iii. multiply the cubic feet of digester gas burned (cubic feet/day) in emissions units B004, B005, and B006 by the heat value of the digester gas as determined in C.1;
- iv. multiply the cubic feet of natural gas burned (cubic feet/day) in emissions units B004, B005, and B006 by the average heat value of natural gas (1000 Btu/cu.ft.);
- v. sum (iii) and (iv);
- vi. determine the NO_x emissions from B004, B005, and B006 by multiplying (v) by the emission factor in AP-42 Chapter 1.4-1(7/98) of 0.98 lb/mmBtu;
- vii. multiply the cubic feet of digester gas burned (cubic feet/day) in emissions units B007, B008, and B009 by the heat value of digester gas as determined in C.1;
- viii. multiply the cubic feet of natural gas burned (cubic feet/day) in emissions units B007, B008, and B009 by the average heat value of natural gas (1000 Btu/cu.ft.);
- ix. sum (vii) and (viii);
- x. determine the NO_x emissions from B007, B008, and B009 by multiplying (ix) by the emission factor in AP-42 Chapter 3.1-1(4/00) of 0.16 lb/mmBtu;
- xi. sum the results from (ii), (vi), and (x);
- xii. sum the results from (xi) for the 365-day period; and
- xiii. divide (xii) by 2000 lbs/ton.

F. Miscellaneous Requirements

1. In accordance with OAC rule 3745-35-07, the following sections of this permit are federally enforceable: A - F.



State of Ohio Environmental Protection Agency

Street Address:

TELE: (614) 644-3020 FAX: (614) 644-2329

Mailing Address:

Lazarus Gov. Center
P.O. Box 1049
Columbus, OH 43216-1049

08/13/01

CERTIFIED MAIL

RE: Final Chapter 3745-35 Permit To Operate

B006 (Boiler #3)

6.65 mmBtu/hr digester or natural gas boiler

City of Dayton Wastewater Treatment Plant (08-57-10-0983)

Thomas Schommer

2800 Guthrie Road

Dayton, OH 45418

Dear Thomas Schommer:

The enclosed Permit(s) to Operate allow you to operate the described emissions unit(s) in the manner indicated in the Permit(s). Because each permit contains several terms and conditions, I urge you to read them carefully.

The Ohio EPA is urging companies to investigate pollution prevention and energy conservation. Not only will this reduce pollution and energy consumption, but it can also save you money. If you would like to learn ways you can save money while protecting the environment, please contact our Office of Pollution Prevention at (614) 644-3469.

You are hereby notified that this action of the Director is final and may be appealed to the Environmental Review Appeals Commission pursuant to Section 3745.04 of the Ohio Revised Code. The appeal must be in writing and set forth the action complained of and the grounds upon which the appeal is based. It must be filed with the Environmental Review Appeals Commission within thirty (30) days after notice of the Director's action. A copy of the appeal must be served on the Director of the Ohio Environmental Protection Agency within three (3) days of filing with the Commission. It is also requested by the Director that a copy of the appeal be served upon the Environmental Enforcement Section of the Office of the Attorney General. An appeal may be filed with the Environmental Review Appeals Commission at the following address:

Environmental Review Appeals Commission
236 East Town Street
Room 300
Columbus, Ohio 43215

If you have any questions, please contact the RAPCA at (937) 225-4435

Very truly yours,

Thomas G. Rigo, Manager
Field Operations and Permit Section
Division of Air Pollution Control

cc: RAPCA



State of Ohio Environmental Protection Agency

Final Permit To Operate An Emissions Unit

Effective Date: 08/13/01

Expiration Date: 08/13/06

This document constitutes issuance to

Facility ID: 08-57-10-0983
City of Dayton Wastewater Treatment Plant
2800 Guthrie Rd.
Dayton, OH 45418

of a permit to operate for:

B006 (Boiler #3)
6.65 mmBtu/hr digester or natural gas boiler

You will be contacted six months prior to the expiration date regarding the renewal of this permit. If you are not contacted, please contact the appropriate Ohio EPA District Office or local air agency identified below. This permit and the authorization to operate the air contaminant source (emissions unit) at this facility shall expire at midnight on the expiration date shown above. If a renewal permit is not issued prior to the expiration date, the permittee may continue to operate pursuant to OAC Chapter 3745-35 and in accordance with the terms of this permit beyond the expiration date, provided that a complete renewal application is submitted no earlier than eighteen (18) months and no later than one-hundred eighty (180) days prior to the expiration date.

Described below is the Ohio EPA District Office or local air agency that is responsible for processing and administering your Title V permit:

RAPCA
451 West Third Street
PO Box 972
Dayton, OH 45422
(937) 225-4435

This permit is granted subject to the conditions attached hereto

OHIO ENVIRONMENTAL PROTECTION AGENCY

A handwritten signature in black ink, appearing to read "Christopher Jones", written over a horizontal line.

Christopher Jones
Director

Part I: General Terms and Conditions

Compliance Requirements

The above-described emissions unit is and shall remain in full compliance with all applicable State and federal laws and regulations and the terms and conditions of this permit.

2. Permit to Install Requirement

Prior to the "installation" or "modification" of any "air contaminant source," as those terms are defined in OAC rule 3745-31-01, a permit to install must be obtained from the Ohio EPA pursuant to OAC Chapter 3745-31.

3. Reporting Requirements Related to Monitoring and Recordkeeping Requirements

The permittee shall submit required reports in the following manner:

- a. Reports of any required monitoring and/or recordkeeping information shall be submitted to the appropriate Ohio EPA District Office or local air agency.
- b. Except as otherwise may be provided in the terms and conditions for a specific emissions unit, quarterly written reports of (a) any deviations (excursions) from emission limitations, operational restrictions, and control device operating parameter limitations that have been detected by the testing, monitoring, and recordkeeping requirements specified in this permit, (b) the probable cause of such deviations, and (c) any corrective actions or preventive measures which have been or will be taken, shall be submitted to the appropriate Ohio EPA District Office or local air agency. If no deviations occurred during a calendar quarter, the permittee shall submit a quarterly report, which states that no deviations occurred during that quarter. The reports shall be submitted quarterly, i.e., by January 31, April 30, July 31, and October 31 of each year and shall cover the previous calendar quarters. (These quarterly reports shall exclude deviations resulting from malfunctions reported in accordance with OAC rule 3745-15-06.)

4. Records Retention Requirements

Each record of any monitoring data, testing data, and support information required pursuant to this permit shall be retained for a period of five years from the date the record was created. Support information shall include, but not be limited to, all calibration and maintenance records and all original strip-chart recordings for continuous monitoring instrumentation, and copies of all reports required by the permit. Such records may be maintained in computerized form.

5. Inspections and Information Requests

The Director of the Ohio EPA, or an authorized representative of the Director, may, subject to the safety requirements of the permittee and without undue delay, enter upon the premises of this source at any reasonable time for purposes of making inspections, conducting tests, examining records or reports pertaining to any emission of air contaminants, and determining compliance with any applicable State and federal air pollution laws and regulations and the terms and conditions of this permit. The permittee shall furnish to the Director of the Ohio EPA, or an authorized representative of the Director, upon receipt of a written request and within a reasonable time, any information that may be requested to determine whether cause exists for modifying, reopening or revoking this permit or to determine compliance with this permit.

Upon verbal or written request, the permittee shall also furnish to the Director of the Ohio EPA, or an authorized representative of the Director, copies of records required to be kept by this permit.

6. Scheduled Maintenance/Malfunction Reporting

Any scheduled maintenance of air pollution control equipment shall be performed in accordance with paragraph (A) of OAC rule 3745-15-06. The malfunction of any emissions unit or any associated air pollution control system(s) shall be reported to the appropriate Ohio EPA District Office or local air agency in accordance with paragraph (B) of OAC rule 3745-15-06. Except as provided in that rule, any scheduled maintenance or malfunction necessitating the shutdown or bypassing of any air pollution control system(s) shall be accompanied by the shutdown of this emissions unit(s) that is (are) served by such control system(s).

7. Permit Transfers

Any transferee of this permit shall assume the responsibilities of the prior permittee. The appropriate Ohio EPA District Office or local air agency must be notified in writing of any transfer of this permit.

8. Air Pollution Nuisance

The air contaminants emitted by the emissions units covered by this permit shall not cause a public nuisance, in violation of OAC rule 3745-15-07.

9. Permit Renewal

Approximately six months prior to the expiration date of this permit, a notice regarding the renewal of this permit will be sent to the permittee's designated facility contact. If you are not contacted, please contact the following Ohio EPA District Office or local air agency which has jurisdiction in the area in which the facility is located:

RAPCA
451 West Third Street
PO Box 972
Dayton, OH 45422
(937) 225-4435

It is the permittee's responsibility to renew this permit even if no notice of its expiration is received.

Part II: Special Terms and Conditions

A. Applicable Emissions Limitations and/or Control Requirements

- The specific operation(s), property, and/or equipment which constitute this emissions unit are listed in the following table along with the applicable rules and/or requirements and with the applicable emissions limitations and/or control measures. Emissions from this unit shall not exceed the listed limitations, and the listed control measures shall be employed. Additional applicable emissions limitations and/or control measures (if any) may be specified in narrative form following the table.

<u>Operations, Property, and/or Equipment</u>	<u>Applicable Rules/ Requirements</u>	<u>Applicable Emissions Limitations/Control Measures</u>
6.65 mmBtu/hr digester gas boiler	OAC 3745-17-10(B)(1)	0.020 lb particulate emissions/mmBtu of actual heat input
	OAC 3745-31-05(A)(3)	The requirements of this rule also include compliance with the requirements of OAC rule 3745-17-11(B)(4). Visible particulate emissions shall not exceed 5% opacity, as a six-minute average.
	OAC 3745-17-07(A)	The emission limitation specified by this rule is less stringent than the emission limitation established pursuant to OAC rule 3745-31-05(A)(3).
	OAC 3745-35-07(B)(2)	See A.2.b - A.2.d

2. Additional Terms and Conditions

- The emissions of sulfur dioxide (SO₂) from emissions units at this facility, identified as P002, P003, P004, B004, B005, B006, B007, B008, and B009, combined, shall not exceed 99.0 tons/year, based on a rolling 365-day summation.
- The emissions of carbon monoxide (CO) from all emissions units at this facility, identified as P002, P003, P004, B004, B005, B006, B007, B008, and B009 combined, shall not exceed 99.0 tons/year, based on a rolling, 365-day summation.
- The emissions of nitrogen oxides (NO_x) from emissions units P002, P003, P004, B004, B005, B006, B007, B008, and B009, combined, shall not exceed 83.0 tons/year, based on a rolling, 365-day summation.

B. Operational Restrictions

- The permittee shall burn only natural gas or digester gas in this emissions unit.
- The maximum amount of digester gas burned in emissions units P002, P003, P004, B004, B005, B006, B007, B008, and B009, combined, shall not exceed 2,800,000 cubic feet/day.
- The hydrogen sulfide content of the digester gas shall not exceed 1007 ppm, as fired. See Section C.2.

C. Monitoring and/or Record Keeping Requirements

1. The permittee shall determine daily the CO₂ content of the digester gas by the use of the Bacharach Fyrite Gas analyzer test method. The Btu/ft³ and density values shall be calculated daily by using the percentage of CO₂ in the digester gas and assuming the remainder of the digester gas is methane. The Btu/ft³ of CO₂ is zero, and the Btu/ft³ of methane is assumed to be 1000 Btu/ft³.

The Btu content of the digester gas shall be calculated by the following equation:

$$\text{Btu/ft}^3 \text{ digester gas} = (\% \text{ CO}_2 \text{ in digester gas})(0 \text{ Btu/ft}^3) + (1 - \% \text{ CO}_2 \text{ in digester gas})(1000 \text{ Btu/ft}^3).$$

The density of the digester gas shall be calculated by the following equation:

$$\text{Density of digester gas} = (\% \text{ CO}_2 \text{ in digester gas})(0.1225 \text{ lb/ft}^3) + (1 - \% \text{ CO}_2 \text{ in digester gas})(0.0446 \text{ lb/ft}^3).$$

*0.1225 lb/ft³ is the density of CO₂
0.0446 lb/ft³ is the density of methane

As a quality control check to determine the accuracy of the Bacharach Fyrite Gas analyzer test method, within 30 days of issuance of this permit and every six months thereafter, the permittee shall collect a grab sample of digester gas to be burned. The samples shall be analyzed in accordance with the appropriate ASTM methods to determine the heat content in Btu per standard cubic foot and the density in lbs/standard cubic foot. If determined necessary by the RAPCA, more frequent testing in accordance with ASTM methods will be required.

2. The permittee shall monitor hydrogen sulfide, within 3 days of issuance of this permit and every 3 days thereafter, by using the Drager or Gastec tubes detection methods. The reliability rating of the Drager or Gastec tubes is +/- 25%. Therefore, to ensure compliance with a hydrogen sulfide concentration of 1007 ppm, hydrogen sulfide readings on the Drager or Gastec tube shall not exceed 806 ppm.

The permittee shall maintain records of all data obtained from the hydrogen sulfide monitoring including, but not limited to, parts per million hydrogen sulfide determined during each test and a record of the daily amount of metal salt added into the anaerobic digester system. The hydrogen sulfide concentrations shall be used to determine the decimal fractions of sulfur for determining compliance with the sulfur dioxide emission limitation. Each measured hydrogen sulfide concentration shall be considered to be the average hydrogen sulfide concentration for the measurement day and for each of the two days thereafter (if no additional measurements are taken during the following two days).

C. Monitoring and/or Record Keeping Requirements (continued)

3. The permittee shall collect and record the following information on a daily basis:
 - a. The total quantity of digester gas burned, in cubic feet, in emissions unit B006.
 - b. The total quantity of digester gas burned, in cubic feet, in emissions units P002, P003, P004, B004, B005, B006, B007, B008, and B009, combined, as a 365-day summation.
 - c. The total quantity of natural gas burned, in cubic feet, in emissions unit B006.
 - d. The total quantity of natural gas gas burned, in cubic feet in emissions units P002, P003, P004, B004, B005, B006, B007, B008, and B009, combined, as a 365-day summation.
 - e. The average decimal fraction of sulfur in the digester gas, by weight.
 - f. The calculated heat content of the digester gas, in Btu per standard cubic foot.
 - g. The calculated density of the digester gas, in lb per standard cubic foot.
 - h. The 365-day rolling summation of the SO₂ emissions rate, in tons, for emissions units P002, P003, P004, B004, B005, B006, B007, B008, and B009, combined, calculated based upon the methodology specified in E.1.c.
 - i. The rolling, 365-day summation of the CO emissions rate, in tons, calculated based upon the methodology outlined in Section E.1.e, for emissions units P002, P003, P004, B004, B005, B006, B007, B008, and B009, combined.
 - j. The rolling 365-day summation of the NO_x emissions rate, in tons, calculated based upon the methodology outlined in Section E.1.d, for emissions units P002, P003, P004, B004, B005, B006, B007, B008, and B009, combined.

4. Within 180 days of the effective date of this permit, the permittee shall develop a written quality assurance/quality control plan for the continuous hydrogen sulfide monitoring system designed to ensure continuous valid and representative readings of hydrogen sulfide. The quality assurance/quality control plan and a logbook dedicated to the continuous hydrogen sulfide monitoring system must be kept on site and be available for inspection during regular office hours.

D. Reporting Requirements

1. The permittee shall submit deviation (excursion) reports that identify each day when a fuel other than natural gas or digester gas was burned in this emissions unit.
2. The permittee shall submit quarterly deviation (excursion) reports which identify all exceedances of the following limitations:
 - a. The daily usage of digester gas (refer to Section B.2);
 - b. The rolling, 365-day sulfur dioxide emissions (refer to Section A.2.a).
 - c. The rolling, 365-day CO emissions (refer to Section A.2.b).
 - d. The rolling, 365-day NO_x emissions (refer to Section A.2.c).
 - e. The hydrogen sulfide content of the digester gas (refer to Section B.3).

These quarterly deviation (excursion) reports shall be submitted in accordance with paragraph (3) of the General Terms and Conditions.

D. Reporting Requirements (continued)

3. The permittee shall submit annual reports which specify the total digester gas usage, the total natural gas usage, and the total carbon monoxide, sulfur dioxide, and nitrogen oxides emissions for emissions units B004, B005, B006, B007, B008, B009, P002, P003, and P004, combined, as a rolling 365-day summation. These reports shall be submitted by January 31 of each year.

E. Testing Requirements

- 1.a Emission Limitation-
5% opacity visible emission limitation, as a six-minute average

Applicable compliance Method-

Compliance shall be determined by visible emission evaluations performed in accordance with OAC rule 3745-17-03(B)(1) using the methods and procedures specified in USEPA Reference Method 9.

- 1.b Emission Limitation-
0.020 pound particulates/mmBtu

Applicable Compliance Method-

For the use of digester gas, compliance shall be based upon multiplying the hourly gas burning capacity of the emissions unit (0.0277 mm cu.ft./hour) by the adjusted AP-42, Table 1.4-2, (7/98) emission factor for digester gas (1.18 particulate/mm cu ft)* and dividing by the maximum hourly heat input capacity of the emissions unit (6.65 mm Btu/hr). For the use of natural gas, compliance shall be based upon multiplying the hourly gas burning capacity of the emissions unit (0.0065 mm cu.ft./hour) by the AP-42, Table 1.4-2, (7/98), emission factor for natural gas (1.9 lb particulate/mm cu ft) and dividing by the maximum hourly heat input capacity of the emissions unit (6.65 mm Btu/hr). If required, emission testing shall be performed in accordance with Method 5.

*The AP-42 emission factor for natural gas is adjusted for digester gas by multiplying the factor for natural gas by 100 - % CO₂ in the digester gas.

- 1.c Emission Limitation-
99.0 tons/year SO₂ emissions for P002, P003, P004, B004, B005, B006, B007, B008, and B009, combined, as a rolling, 365-day summation

Applicable Compliance Method-

Compliance shall be determined by use of the formula for gaseous fuels in OAC rule 3745-18-04(F)(3)

$$ER = (1 \times 10^6) / H \times D \times S \times 1.998$$

where: ER = the emission rate, in pounds of sulfur dioxide per mmBtu;
H = the heat content of the gaseous fuel, in Btu per standard cubic foot;
D = the density of the gaseous fuel, in pounds per standard cubic foot; and
S = the decimal fraction of sulfur in the gaseous fuel, by weight.*

The daily SO₂ emissions are calculated using the following equation

$$SO_2 \text{ (tons/day)} = ER \text{ (lbs/mmBtu)} \times \text{Gas Consumption (cu.ft/day)} \times (\text{Btu/cu.ft}) / 2000 \text{ lbs/ton}$$

The rolling, 365-day summation is the sum of the daily SO₂ emission rates for the 365-day period. (The SO₂ emissions from the combustion of natural gas is assumed to be negligible in comparison to the emissions from the digester gas.)

*The Dräger or Gastic tubes read in ppm, by volume. To convert to ppm by weight, multiply by the following ratio: density of H₂S/density of digester gas. The density of H₂S is equal to 0.08672 lb/ft³.

E. Testing Requirements (continued)

- 1.d. Emission Limitation-**
83.0 tons/year NO_x for P002, P003, P004, B004, B005, B006, B007, B008, and B009 combined, as a rolling, 365-day summation

Applicable Compliance Method-

Compliance shall be determined by the calculation of the rolling 365-day emissions for all emissions units, as determined by the following methodology:

- i. multiply the cubic feet of digester gas burned (cubic feet/day) in emissions units P002, P003, and P004 by the heat value of digester gas as determined in C.1;
- ii. determine the NO_x emissions from P002, P003, and P004 by multiplying the product in (i) by the emission factor in AP-42 Chapter 13.5-1(9/91) of 0.068 lb NO_x/mmBtu.;
- iii. multiply the cubic feet of digester gas burned (cubic feet/day) in emissions units B004, B005, and B006 by the heat value of the digester gas as determined in C.1;
- iv. multiply the cubic feet of natural gas burned (cubic feet/day) in emissions units B004, B005, and B006 by the average heat value of natural gas (1000 Btu/cu.ft.);
- v. sum (iii) and (iv);
- vi. determine the NO_x emissions from B004, B005, and B006 by multiplying (v) by the emission factor in AP-42 Chapter 1.4-1(7/98) of 0.98 lb/mmBtu;
- vii. multiply the cubic feet of digester gas burned (cubic feet/day) in emissions units B007, B008, and B009 by the heat value of digester gas as determined in C.1;
- viii. multiply the cubic feet of natural gas burned (cubic feet/day) in emissions units B007, B008, and B009 by the average heat value of natural gas (1000 Btu/cu.ft.);
- ix. sum (vii) and (viii);
- x. determine the NO_x emissions from B007, B008, and B009 by multiplying (ix) by the emission factor in AP-42 Chapter 3.1-1(4/00) of 0.16 lb/mmBtu;
- xi. sum the results from (ii), (vi), and (x);
- xii. sum the results from (xi) for the 365-day period; and
- xiii. divide (xii) by 2000 lbs/ton.

E. Testing Requirements (continued)

- 1.e** Emission Limitation-
99.0 tons/year CO for P002, P003, P004, B004, B005, B006, B007, B008, and B009, combined, as a rolling, 365-day summation

Applicable Compliance Method-

Compliance shall be determined by the calculation of the rolling 365-day emissions for all emissions units, as determined by the following methodology.

- i. multiply the cubic feet of digester gas burned (cubic feet/day) in emissions units P002, P003, and P004 by the heat value of digester gas as determined in C.1;
- ii. determine the CO emissions from P002, P003, and P004 by multiplying the product in (i) by the emission factor in AP-42 Chapter 13.5-1(9/91) of 0.37 lb CO/mmBtu.;
- iii. multiply the cubic feet of digester gas burned (cubic feet/day) in emissions units B004, B005, and B006 by the heat value of the digester gas as determined in C.1;
- iv. multiply the cubic feet of natural gas burned (cubic feet/day) in emissions units B004, B005, and B006 by the average heat value of natural gas (1000 Btu/cu.ft.);
- v. sum (iii) and (iv);
- vi. determine the CO emissions from B004, B005, and B006 by multiplying (v) by the emission factor in AP-42 Chapter 1.4-1(7/98) of 0.084 lb/mmBtu;
- vii. multiply the cubic feet of digester gas burned (cubic feet/day) in emissions units B007, B008, and B009 by the heat value of the digester gas as determined in C.1;
- viii. multiply the cubic feet of natural gas burned (cubic feet/day) in emissions units B007, B008, and B009 by the heat value of the natural gas (1000 Btu/cu.ft.);
- ix. sum (vii) and (viii);
- x. determine the CO emissions from B007, B008, and B009 by multiplying (ix) by the emission factor in AP-42 Chapter 3.1-1(4/00) of 0.017 lb/mmBtu;
- xi. sum the results from (ii), (vi), and (x); and
- xii. sum the results from (xi) for the 365-day period; and
- xiii. divide (xii) by 2000 lbs/ton.

F. Miscellaneous Requirements

1. In accordance with OAC rule 3745-35-07, the following sections of this permit are federally enforceable: A - F



State of Ohio Environmental Protection Agency

Street Address:

Lazarus Gov. Center
122 S. Front Street
Columbus, OH 43215

TELE: (614) 644-3020 FAX: (614) 644-2329

Mailing Address:

Lazarus Gov. Center
P.O. Box 1049
Columbus, OH 43216-1049

08/13/01

CERTIFIED MAIL

RE: Final Chapter 3745-35 Permit To Operate

**B005 (Boiler #2)
6.65 mmBtu/hr digester or natural gas boiler**

City of Dayton Wastewater Treatment Plant (08-57-10-0983)

Thomas Schommer
2800 Guthrie Road
Dayton, OH 45418

Dear Thomas Schommer:

The enclosed Permit(s) to Operate allow you to operate the described emissions unit(s) in the manner indicated in the Permit(s). Because each permit contains several terms and conditions, I urge you to read them carefully.

The Ohio EPA is urging companies to investigate pollution prevention and energy conservation. Not only will this reduce pollution and energy consumption, but it can also save you money. If you would like to learn ways you can save money while protecting the environment, please contact our Office of Pollution Prevention at (614) 644-3469.

You are hereby notified that this action of the Director is final and may be appealed to the Environmental Review Appeals Commission pursuant to Section 3745.04 of the Ohio Revised Code. The appeal must be in writing and set forth the action complained of and the grounds upon which the appeal is based. It must be filed with the Environmental Review Appeals Commission within thirty (30) days after notice of the Director's action. A copy of the appeal must be served on the Director of the Ohio Environmental Protection Agency within three (3) days of filing with the Commission. It is also requested by the Director that a copy of the appeal be served upon the Environmental Enforcement Section of the Office of the Attorney General. An appeal may be filed with the Environmental Review Appeals Commission at the following address:

Environmental Review Appeals Commission
236 East Town Street
Room 300
Columbus, Ohio 43215

If you have any questions, please contact the RAPCA at (937) 225-4435

Very truly yours,

Thomas G. Rigo, Manager
Field Operations and Permit Section
Division of Air Pollution Control

cc: RAPCA



State of Ohio Environmental Protection Agency

Final Permit To Operate An Emissions Unit

Effective Date: 08/13/01

Expiration Date: 08/13/06

This document constitutes issuance to:

Facility ID: 08-57-10-0983
City of Dayton Wastewater Treatment Plant
2800 Guthrie Rd.
Dayton, OH 45418

of a permit to operate for:

B005 (Boiler #2)
6.65 mmBtu/hr digester or natural gas boiler

You will be contacted six months prior to the expiration date regarding the renewal of this permit. If you are not contacted, please contact the appropriate Ohio EPA District Office or local air agency identified below. This permit and the authorization to operate the air contaminant source (emissions unit) at this facility shall expire at midnight on the expiration date shown above. If a renewal permit is not issued prior to the expiration date, the permittee may continue to operate pursuant to OAC Chapter 3745-35 and in accordance with the terms of this permit beyond the expiration date, provided that a complete renewal application is submitted no earlier than eighteen (18) months and no later than one-hundred eighty (180) days prior to the expiration date.

Described below is the Ohio EPA District Office or local air agency that is responsible for processing and administering your Title V permit:

RAPCA
451 West Third Street
PO Box 972
Dayton, OH 45422
(937) 225-4435

This permit is granted subject to the conditions attached hereto.

OHIO ENVIRONMENTAL PROTECTION AGENCY

A handwritten signature in cursive script, appearing to read "Christopher Jones", written over a horizontal line.

Christopher Jones
Director

Part I: General Terms and Conditions

Compliance Requirements

The above-described emissions unit is and shall remain in full compliance with all applicable State and federal laws and regulations and the terms and conditions of this permit.

2. Permit to Install Requirement

Prior to the "installation" or "modification" of any "air contaminant source," as those terms are defined in OAC rule 3745-31-01, a permit to install must be obtained from the Ohio EPA pursuant to OAC Chapter 3745-31.

3 Reporting Requirements Related to Monitoring and Recordkeeping Requirements

The permittee shall submit required reports in the following manner:

- a Reports of any required monitoring and/or recordkeeping information shall be submitted to the appropriate Ohio EPA District Office or local air agency.
- b. Except as otherwise may be provided in the terms and conditions for a specific emissions unit, quarterly written reports of (a) any deviations (excursions) from emission limitations, operational restrictions, and control device operating parameter limitations that have been detected by the testing, monitoring, and recordkeeping requirements specified in this permit, (b) the probable cause of such deviations, and (c) any corrective actions or preventive measures which have been or will be taken, shall be submitted to the appropriate Ohio EPA District Office or local air agency. If no deviations occurred during a calendar quarter, the permittee shall submit a quarterly report, which states that no deviations occurred during that quarter. The reports shall be submitted quarterly, i.e., by January 31, April 30, July 31, and October 31 of each year and shall cover the previous calendar quarters. (These quarterly reports shall exclude deviations resulting from malfunctions reported in accordance with OAC rule 3745-15-06.)

4 Records Retention Requirements

Each record of any monitoring data, testing data, and support information required pursuant to this permit shall be retained for a period of five years from the date the record was created. Support information shall include, but not be limited to, all calibration and maintenance records and all original strip-chart recordings for continuous monitoring instrumentation, and copies of all reports required by the permit. Such records may be maintained in computerized form.

5. Inspections and Information Requests

The Director of the Ohio EPA, or an authorized representative of the Director, may, subject to the safety requirements of the permittee and without undue delay, enter upon the premises of this source at any reasonable time for purposes of making inspections, conducting tests, examining records or reports pertaining to any emission of air contaminants, and determining compliance with any applicable State and federal air pollution laws and regulations and the terms and conditions of this permit. The permittee shall furnish to the Director of the Ohio EPA, or an authorized representative of the Director, upon receipt of a written request and within a reasonable time, any information that may be requested to determine whether cause exists for modifying, reopening or revoking this permit or to determine compliance with this permit.

Upon verbal or written request, the permittee shall also furnish to the Director of the Ohio EPA, or an authorized representative of the Director, copies of records required to be kept by this permit.

6. Scheduled Maintenance/Malfunction Reporting

Any scheduled maintenance of air pollution control equipment shall be performed in accordance with paragraph (A) of OAC rule 3745-15-06. The malfunction of any emissions unit or any associated air pollution control system(s) shall be reported to the appropriate Ohio EPA District Office or local air agency in accordance with paragraph (B) of OAC rule 3745-15-06. Except as provided in that rule, any scheduled maintenance or malfunction necessitating the shutdown or bypassing of any air pollution control system(s) shall be accompanied by the shutdown of this emissions unit(s) that is (are) served by such control system(s).

7. Permit Transfers

Any transferee of this permit shall assume the responsibilities of the prior permittee. The appropriate Ohio EPA District Office or local air agency must be notified in writing of any transfer of this permit.

8. Air Pollution Nuisance

The air contaminants emitted by the emissions units covered by this permit shall not cause a public nuisance, in violation of OAC rule 3745-15-07.

9. Permit Renewal

Approximately six months prior to the expiration date of this permit, a notice regarding the renewal of this permit will be sent to the permittee's designated facility contact. If you are not contacted, please contact the following Ohio EPA District Office or local air agency which has jurisdiction in the area in which the facility is located:

RAPCA
451 West Third Street
PO Box 972
Dayton, OH 45422
(937) 225-4435

It is the permittee's responsibility to renew this permit even if no notice of its expiration is received

Part II: Special Terms and Conditions

A. Applicable Emissions Limitations and/or Control Requirements

1. The specific operation(s), property, and/or equipment which constitute this emissions unit are listed in the following table along with the applicable rules and/or requirements and with the applicable emissions limitations and/or control measures. Emissions from this unit shall not exceed the listed limitations, and the listed control measures shall be employed. Additional applicable emissions limitations and/or control measures (if any) may be specified in narrative form following the table.

<u>Operations, Property, and/or Equipment</u>	<u>Applicable Rules/ Requirements</u>	<u>Applicable Emissions Limitations/Control Measures</u>
6.65 mmBtu/hr digester gas boiler, Boiler #2	OAC 3745-17-10(B)(1)	0.020 lb particulate emissions/mmBtu of actual heat input
	OAC 3745-31-05(A)(3)	Visible particulate emissions shall not exceed 5% opacity, as a six-minute average. The requirements of this rule also include compliance with the requirements of OAC rule 3745-17-11(B)(4).
	OAC 3745-17-07(A)	The emission limitation specified by this rule is less stringent than the emission limitation established pursuant to OAC rule 3745-31-05(A)(3).
	OAC 3745-35-07(B)(2)	See A.2.a to A.2.c

2. Additional Terms and Conditions

- 2.a The emissions of sulfur dioxide (SO₂) from emissions units P002, P003, P004, B004, B005, B006, B007, B008, and B009, combined, shall not exceed 99.0 tons/year, based on a rolling, 365-day summation.
- 2.b The emissions of carbon monoxide (CO) from emissions units P002, P003, P004, B004, B005, B006, B007, B008, and B009, combined, shall not exceed 99.0 tons/year, based on a rolling, 365-day summation.
- 2.c The emissions of nitrogen oxides (NO_x) from emissions units P002, P003, P004, B004, B005, B006, B007, B008, and B009, combined, shall not exceed 83.0 tons/year, based on a rolling, 365-day summation.

B. Operational Restrictions

1. The permittee shall burn only natural gas or digester gas in this emissions unit.
2. The maximum amount of digester gas burned in emissions units P002, P003, P004, B004, B005, B006, B007, B008, and B009, combined, shall not exceed 2,800,000 cubic feet/day.

B. Operational Restrictions (continued)

3. The hydrogen sulfide content of the digester gas shall not exceed 1007 ppm, as fired. See Section C.2

C Monitoring and/or Record Keeping Requirements

1. The permittee shall determine daily the CO₂ content of the digester gas by the use of the Bacharach Fyrite Gas analyzer test method. The Btu/ft³ and density values shall be calculated daily by using the percentage of CO₂ in the digester gas and assuming the remainder of the digester gas is methane. The Btu/ft³ of CO₂ is zero, and the Btu/ft³ of methane is assumed to be 1000 Btu/ft³.

The Btu content of the digester gas shall be calculated by the following equation:

$$\text{Btu/ft}^3 \text{ digester gas} = (\% \text{ CO}_2 \text{ in digester gas})(0 \text{ Btu/ft}^3) + (1 - \% \text{ CO}_2 \text{ in digester gas})(1000 \text{ Btu/ft}^3).$$

The density of digester gas shall be calculated by the following:

$$\text{Density of digester gas} = (\% \text{ CO}_2 \text{ in digester gas})(0.1225 \text{ lb/ft}^3) + (1 - \% \text{ CO}_2 \text{ in digester gas})(0.0446 \text{ lb/ft}^3)$$

*0.1225 lb/ft³ is the density of CO₂

0.0446 lb/ft³ is the density of methane

As a quality control check to determine the accuracy of the Bacharach Fyrite Gas analyzer test method, within 30 days of issuance of this permit and every six months thereafter, the permittee shall collect a grab sample of digester gas to be burned. The samples shall be analyzed in accordance with the appropriate ASTM methods to determine the heat content, in Btu per standard cubic foot, and the density, in lbs/standard cubic foot. If determined necessary by the RAPCA, more frequent testing in accordance with ASTM methods shall be required.

2. The permittee shall monitor hydrogen sulfide, within 3 days of issuance of this permit and every 3 days thereafter, by using the Dräger or Gastec tubes detection methods. The reliability rating of the Dräger or Gastec tubes is +/- 25%. To assure compliance with a H₂S concentration of 1007 ppm, H₂S readings on the Dräger or Gastec tube shall not exceed 806 ppm.

The permittee shall maintain records of all data obtained by the hydrogen sulfide monitoring system including but not limited to, parts per million hydrogen sulfide determined during each testing period and a record of the daily amount of metal salt added into the anaerobic digester system. The hydrogen sulfide concentration shall be used to determine the decimal fraction of sulfur for purposes of determining compliance with the sulfur dioxide emission limitation. The hydrogen sulfide concentration determined shall be assumed as the average daily hydrogen sulfide concentration for the day of monitoring and two days thereafter (if no additional measurements are taken during the following two days).

C. Monitoring and/or Record Keeping Requirements (continued)

3. The permittee shall collect and record the following information on a daily basis:
 - a. The total quantity of digester gas burned, in cubic feet, in emissions unit B005
 - b. The total quantity of digester gas burned, in cubic feet, in emissions units P002, P003, P004, B004, B005, B006, B007, B008, and B009, combined, as a 365-day summation.
 - c. The total quantity of natural gas burned, in cubic feet, in emissions unit B005
 - d. The total quantity of natural gas burned, in cubic feet, in emissions units P002, P003, P004, B004, B005, B006, B007, B008, and B009, combined, as a 365-day summation.
 - e. The average decimal fraction of sulfur in the digester gas, by weight
 - f. The calculated heat content of the digester gas, in Btu per standard cubic foot.
 - g. The calculated density of the digester gas, in lb per standard cubic foot.
 - h. The 365-day rolling summation of the SO₂ emission rate, in tons, for emissions units P002, P003, P004, B004, B005, B006, B007, B008, and B009, combined, calculated based upon the methodology specified in E.1.c.
 - i. The rolling, 365-day summation of the CO emission rate, in tons, calculated based upon the methodology specified in Section E.1.e, for emissions units P002, P003, P004, B004, B005, B006, B007, B008, and B009, combined.
 - j. The rolling 365-day summation of the NO_x emissions rate, in tons, calculated based upon the methodology specified in Section E.1.d, for emissions units P002, P003, P004, B004, B005, B006, B007, B008, and B009, combined.

4. Within 180 days of the effective date of this permit, the permittee shall develop a written quality assurance/quality control plan for the continuous hydrogen sulfide monitoring system designed to ensure continuous valid and representative readings of hydrogen sulfide. The quality assurance/quality control plan and a logbook dedicated to the continuous hydrogen sulfide monitoring system must be kept on site and be available for inspection during regular office hours.

D. Reporting Requirements

1. The permittee shall submit deviation (excursion) reports that identify each day when a fuel other than natural gas or digester gas was burned in this emissions unit.

D. Reporting Requirements (continued)

2. The permittee shall submit quarterly deviation (excursion) reports which identify all exceedances of the following limitations:

- a. The daily usage of digester gas (refer to Section B.2).
- b. The rolling, 365-day sulfur dioxide emissions (refer to Section A.2.a).
- c. The rolling, 365-day CO emissions (refer to Section A.2.b).
- d. The rolling, 365-day NOx emissions (refer to Section A.2.c).
- e. The hydrogen sulfide content of the digester gas (refer to Section B.3).

These quarterly deviation (excursion) reports shall be submitted in accordance with paragraph (3) of the General Terms and Conditions.

3. The permittee shall submit annual reports which specify the total digester gas usage, the total natural gas usage, the carbon monoxide, sulfur dioxide, and nitrogen oxides emissions for emissions units B004, B005, B006, B007, B008, B009, P002, P003, and P004, combined, as a rolling 365-day summation. These reports shall be submitted by January 31 of each year.

E. Testing Requirements

- 1.a. Emission Limitation-
5% opacity visible emission limitation, as a six-minute average

Applicable compliance Method-

Compliance shall be determined by visible emission evaluations performed in accordance with OAC rule 3745-17-03(B)(1) using the methods and procedures specified in USEPA Reference Method 9.

- 1.b Emission Limitation-
0.020 pound particulates/mmBtu

Applicable Compliance Method-

For the use of digester gas, compliance shall be based upon multiplying the hourly gas burning capacity of the emissions unit (0.0277 mm cu.ft./hour) by the adjusted AP-42, Table 1.4-2, (7/98) emission factor for digester gas (1.18 particulate/mm cu ft)* and dividing by the maximum hourly heat input capacity of the emissions unit (6.65 mm Btu/hr). For the use of natural gas, compliance shall be based upon multiplying the hourly gas burning capacity of the emissions unit (0.0065 mm cu.ft./hour) by the AP-42, Table 1.4-2, (7/98), emission factor for natural gas (1.9 lb particulate/mm cu ft) and dividing by the maximum hourly heat input capacity of the emissions unit (6.65 mm Btu/hr). If required, emission testing shall be performed in accordance with USEPA Method 5.

*The AP-42 emission factor for natural gas is adjusted for digester gas by multiplying the factor for natural gas by 1-%CO₂ in digester gas.

E. Testing Requirements (continued)

- 1.c** Emission Limitation-
99.0 tons/year SO₂ emissions for P002, P003, P004, B004, B005, B006, B007, B008, and B009, combined, as a rolling, 365-day summation

Applicable Compliance Method-
Compliance shall be determined by use of the formula for gaseous fuels in OAC rule 3745-18-04(F)(3):

$$ER = (1 \times 10^6) / H \times D \times S \times 1.998$$

where: ER = the emission rate, in pounds of sulfur dioxide per mmBtu;
H = the heat content of the gaseous fuel, in Btu per standard cubic foot;
D = the density of the gaseous fuel, in pounds per standard cubic foot; and
S = the decimal fraction of sulfur in the gaseous fuel, by weight.*

The daily SO₂ emissions are calculated using the following equation

$$\text{SO}_2 \text{ (tons/day)} = ER \text{ (lbs/mmBtu)} \times \text{Gas Consumption (cu.ft/day)} \times (\text{Btu/cu.ft}) / 2000 \text{ lbs/ton}$$

The rolling, 365-day summation is the sum of the daily SO₂ emission rates for the 365-day period. (The SO₂ emissions from the combustion of natural gas is assumed to be negligible in comparison to the emissions from the digester gas.)

*The Dräger or Gastic tubes read in ppm, by volume. To convert to ppm by weight, multiply by the following ratio: density of H₂S/density of digester gas. The density of H₂S is equal to 0.08672 lb/ft³.

- 1.d** Emission Limitation-
83.0 tons/year NO_x for P002, P003, P004, B004, B005, B006, B007, B008, and B009 combined, as a rolling 365-day summation

Applicable Compliance Method-
Compliance shall be determined by the calculation of the rolling 365-day emissions for all emissions units, as determined by the following methodology:

- i. multiply the cubic feet of digester gas burned (cubic feet/day) in emissions units P002, P003, and P004 by the heat value of digester gas as determined in C.1;
- ii. determine the NO_x emissions from P002, P003, and P004 by multiplying the product in (i) by the emission factor in AP-42 Chapter 13.5-1(9/91) of 0.068 lb NO_x/mmBtu.;
- iii. multiply the cubic feet of digester gas burned (cubic feet/day) in emissions units B004, B005, and B006 by the heat value of the digester gas as determined in C.1;
- iv. multiply the cubic feet of natural gas burned (cubic feet/day) in emissions units B004, B005, and B006 by the average heat value of natural gas (1000 Btu/cu.ft.);
- v. sum (iii) and (iv);
- vi. determine the NO_x emissions from B004, B005, and B006 by multiplying (v) by the emission factor in AP-42 Chapter 1.4-1(7/98) of 0.98 lb/mmBtu;
- vii. multiply the cubic feet of digester gas burned (cubic feet/day) in emissions units B007, B008, and B009 by the heat value of digester gas as determined in C.1;
- viii. multiply the cubic feet of natural gas burned (cubic feet/day) in emissions units B007, B008, and B009 by the average heat value of natural gas (1000 Btu/cu.ft.);
- ix. sum (vii) and (viii);
- x. determine the NO_x emissions from B007, B008, and B009 by multiplying (ix) by the emission factor in AP-42 Chapter 3.1-1(4/00) of 0.16 lb/mmBtu;
- xi. sum the results from (ii), (vi), and (x);
- xii. sum the results from (xi) for the 365-day period; and
- xiii. divide (xii) by 2000 lbs/ton.

E. Testing Requirements (continued)

- 1.e** Emission Limitation-
99.0 tons/year CO for P002, P003, P004, B004, B005, B006, B007, B008, and B009, combined, as a rolling, 365-day summation

Applicable Compliance Method-

Compliance shall be determined by the calculation of the rolling 365-day emissions for all emissions units, as determined by the following methodology.

- i. multiply the cubic feet of digester gas burned (cubic feet/day) in emissions units P002, P003, and P004 by the heat value of digester gas as determined in C.1;
- ii. determine the CO emissions from P002, P003, and P004 by multiplying the product in (i) by the emission factor in AP-42 Chapter 13.5-1(9/91) of 0.37 lb CO/mmBtu.;
- iii. multiply the cubic feet of digester gas burned (cubic feet/day) in emissions units B004, B005, and B006 by the heat value of the digester gas as determined in C.1;
- iv. multiply the cubic feet of natural gas burned (cubic feet/day) in emissions units B004, B005, and B006 by the average heat value of natural gas (1000 Btu/cu.ft.);
- v. sum (iii) and (iv);
- vi. determine the CO emissions from B004, B005, and B006 by multiplying (v) by the emission factor in AP-42 Chapter 1.4-1(7/98) of 0.084 lb/mmBtu;
- vii. multiply the cubic feet of digester gas burned (cubic feet/day) in emissions units B007, B008, and B009 by the heat value of the digester gas as determined in C.1;
- viii. multiply the cubic feet of natural gas burned (cubic feet/day) in emissions units B007, B008, and B009 by the heat value of the natural gas (1000 Btu/cu.ft.);
- ix. sum (vii) and (viii);
- x. determine the CO emissions from B007, B008, and B009 by multiplying (ix) by the emission factor in AP-42 Chapter 3.1-1(4/00) of 0.017 lbmmBtu;
- xi. sum the results from (ii), (vi), and (x); and
- xii. sum the results from (xi) for the 365-day period; and
- xiii. divide (xii) by 2000 lbs/ton.

F. Miscellaneous Requirements

1. In accordance with OAC rule 3745-35-07, the following sections of this permit are federally enforceable: A - F.



State of Ohio Environmental Protection Agency

Street Address:

Mailing Address:

TELE: (614) 644-3020 FAX: (614) 644-2329

08/13/01

CERTIFIED MAIL

RE: Final Chapter 3745-35 Permit To Operate

B004 (Boiler #1)

6.65 mmBtu/hr digester or natural gas boiler

City of Dayton Wastewater Treatment Plant (08-57-10-0983)
Thomas Schommer
2800 Guthrie Road
Dayton, OH 45418

Dear Thomas Schommer:

The enclosed Permit(s) to Operate allow you to operate the described emissions unit(s) in the manner indicated in the Permit(s). Because each permit contains several terms and conditions, I urge you to read them carefully.

The Ohio EPA is urging companies to investigate pollution prevention and energy conservation. Not only will this reduce pollution and energy consumption, but it can also save you money. If you would like to learn ways you can save money while protecting the environment, please contact our Office of Pollution Prevention at (614) 644-3469.

You are hereby notified that this action of the Director is final and may be appealed to the Environmental Review Appeals Commission pursuant to Section 3745.04 of the Ohio Revised Code. The appeal must be in writing and set forth the action complained of and the grounds upon which the appeal is based. It must be filed with the Environmental Review Appeals Commission within thirty (30) days after notice of the Director's action. A copy of the appeal must be served on the Director of the Ohio Environmental Protection Agency within three (3) days of filing with the Commission. It is also requested by the Director that a copy of the appeal be served upon the Environmental Enforcement Section of the Office of the Attorney General. An appeal may be filed with the Environmental Review Appeals Commission at the following address:

Environmental Review Appeals Commission
236 East Town Street
Room 300
Columbus, Ohio 43215

If you have any questions, please contact the RAPCA at (937) 225-4435.

Very truly yours,

Thomas G. Rigo, Manager
Field Operations and Permit Section
Division of Air Pollution Control

cc: RAPCA



State of Ohio Environmental Protection Agency

Final Permit To Operate An Emissions Unit

Effective Date: 08/13/01

Expiration Date: 08/13/06

This document constitutes issuance to:

Facility ID: 08-57-10-0983
City of Dayton Wastewater Treatment Plant
2800 Guthrie Rd.
Dayton, OH 45418

of a permit to operate for:

B004 (Boiler #1)
6.65 mmBtu/hr digester or natural gas boiler

You will be contacted six months prior to the expiration date regarding the renewal of this permit. If you are not contacted, please contact the appropriate Ohio EPA District Office or local air agency identified below. This permit and the authorization to operate the air contaminant source (emissions unit) at this facility shall expire at midnight on the expiration date shown above. If a renewal permit is not issued prior to the expiration date, the permittee may continue to operate pursuant to OAC Chapter 3745-35 and in accordance with the terms of this permit beyond the expiration date, provided that a complete renewal application is submitted no earlier than eighteen (18) months and no later than one-hundred eighty (180) days prior to the expiration date.

Described below is the Ohio EPA District Office or local air agency that is responsible for processing and administering your Title V permit:

RAPCA
451 West Third Street
PO Box 972
Dayton, OH 45422
(937) 225-4435

This permit is granted subject to the conditions attached hereto.

OHIO ENVIRONMENTAL PROTECTION AGENCY

A handwritten signature in cursive script, appearing to read "Christopher Jones", written over a horizontal line.

Christopher Jones
Director

Part I: General Terms and Conditions

1 Compliance Requirements

The above-described emissions unit is and shall remain in full compliance with all applicable State and federal laws and regulations and the terms and conditions of this permit.

2. Permit to Install Requirement

Prior to the "installation" or "modification" of any "air contaminant source," as those terms are defined in OAC rule 3745-31-01, a permit to install must be obtained from the Ohio EPA pursuant to OAC Chapter 3745-31.

3. Reporting Requirements Related to Monitoring and Recordkeeping Requirements

The permittee shall submit required reports in the following manner:

- a. Reports of any required monitoring and/or recordkeeping information shall be submitted to the appropriate Ohio EPA District Office or local air agency.
- b. Except as otherwise may be provided in the terms and conditions for a specific emissions unit, quarterly written reports of (a) any deviations (excursions) from emission limitations, operational restrictions, and control device operating parameter limitations that have been detected by the testing, monitoring, and recordkeeping requirements specified in this permit, (b) the probable cause of such deviations, and (c) any corrective actions or preventive measures which have been or will be taken, shall be submitted to the appropriate Ohio EPA District Office or local air agency. If no deviations occurred during a calendar quarter, the permittee shall submit a quarterly report, which states that no deviations occurred during that quarter. The reports shall be submitted quarterly, i.e., by January 31, April 30, July 31, and October 31 of each year and shall cover the previous calendar quarters. (These quarterly reports shall exclude deviations resulting from malfunctions reported in accordance with OAC rule 3745-15-06.)

4. Records Retention Requirements

Each record of any monitoring data, testing data, and support information required pursuant to this permit shall be retained for a period of five years from the date the record was created. Support information shall include, but not be limited to, all calibration and maintenance records and all original strip-chart recordings for continuous monitoring instrumentation, and copies of all reports required by the permit. Such records may be maintained in computerized form.

5. Inspections and Information Requests

The Director of the Ohio EPA, or an authorized representative of the Director, may, subject to the safety requirements of the permittee and without undue delay, enter upon the premises of this source at any reasonable time for purposes of making inspections, conducting tests, examining records or reports pertaining to any emission of air contaminants, and determining compliance with any applicable State and federal air pollution laws and regulations and the terms and conditions of this permit. The permittee shall furnish to the Director of the Ohio EPA, or an authorized representative of the Director, upon receipt of a written request and within a reasonable time, any information that may be requested to determine whether cause exists for modifying, reopening or revoking this permit or to determine compliance with this permit.

Upon verbal or written request, the permittee shall also furnish to the Director of the Ohio EPA, or an authorized representative of the Director, copies of records required to be kept by this permit.

6. Scheduled Maintenance/Malfunction Reporting

Any scheduled maintenance of air pollution control equipment shall be performed in accordance with paragraph (A) of OAC rule 3745-15-06. The malfunction of any emissions unit or any associated air pollution control system(s) shall be reported to the appropriate Ohio EPA District Office or local air agency in accordance with paragraph (B) of OAC rule 3745-15-06. Except as provided in that rule, any scheduled maintenance or malfunction necessitating the shutdown or bypassing of any air pollution control system(s) shall be accompanied by the shutdown of this emissions unit(s) that is (are) served by such control system(s).

7. Permit Transfers

Any transferee of this permit shall assume the responsibilities of the prior permittee. The appropriate Ohio EPA District Office or local air agency must be notified in writing of any transfer of this permit.

8. Air Pollution Nuisance

The air contaminants emitted by the emissions units covered by this permit shall not cause a public nuisance, in violation of OAC rule 3745-15-07.

9. Permit Renewal

Approximately six months prior to the expiration date of this permit, a notice regarding the renewal of this permit will be sent to the permittee's designated facility contact. If you are not contacted, please contact the following Ohio EPA District Office or local air agency which has jurisdiction in the area in which the facility is located:

RAPCA
451 West Third Street
PO Box 972
Dayton, OH 45422
(937) 225-4435

It is the permittee's responsibility to renew this permit even if no notice of its expiration is received.

Part II: Special Terms and Conditions

A. Applicable Emissions Limitations and/or Control Requirements

1. The specific operation(s), property, and/or equipment which constitute this emissions unit are listed in the following table along with the applicable rules and/or requirements and with the applicable emissions limitations and/or control measures. Emissions from this unit shall not exceed the listed limitations, and the listed control measures shall be employed. Additional applicable emissions limitations and/or control measures (if any) may be specified in narrative form following the table.

<u>Operations, Property, and/or Equipment</u>	<u>Applicable Rules/ Requirements</u>	<u>Applicable Emissions Limitations/Control Measures</u>
6.65 mmBtu/hr digester gas boiler, Boiler #1	OAC 3745-17-10 (B)(1)	0.020 lb particulate emissions/mmBtu of actual heat input
	OAC 3745-31-05(A)(3)	Visible particulate emissions shall not exceed 5% opacity, as a six-minute average. The requirements of this rule also include compliance with the requirements of OAC rule 3745-17-11(B)(4).
	OAC 3745-17-07(A)	The emission limitation specified by this rule is less stringent than the emission limitation established pursuant to OAC rule 3745-31-05(A)(3).
	OAC 3745-35-07(B)(2)	See A.2.a to A.2.c

2. Additional Terms and Conditions

- 2.a The emissions of sulfur dioxide (SO₂) from emissions units P002, P003, P004, B004, B005, B006, B007, B008, and B009, combined, shall not exceed 99.0 tons/year, based on a rolling, 365-day summation.
- 2.b The emissions of carbon monoxide (CO) from emissions units P002, P003, P004, B004, B005, B006, B007, B008, and B009, combined, shall not exceed 99.0 tons/year, based on a rolling, 365-day summation.
- 2.c The emissions of nitrogen oxides (NO_x) from emissions units P002, P003, P004, B004, B005, B006, B007, B008, and B009, combined, shall not exceed 83.0 tons/year, based on a rolling, 365-day summation.

B. Operational Restrictions

1. The permittee shall burn only natural gas or digester gas in this emissions unit.
2. The maximum amount of digester gas burned in emissions units P002, P003, P004, B004, B005, B006, B007, B008, and B009, combined, shall not exceed 2,800,000 cubic feet/day.
3. The hydrogen sulfide content of the digester gas shall not exceed 1007 ppm, as fired. See Section C.2.

C. Monitoring and/or Record Keeping Requirements

1. The permittee shall determine daily the CO₂ content of the digester gas by the use of the Bacharach Fyrite Gas analyzer test method. The Btu/ft³ and density values shall be calculated daily by using the percentage of CO₂ in the digester gas and assuming the remainder of the digester gas is methane. The Btu/ft³ of CO₂ is zero, and the Btu/ft³ of methane is assumed to be 1000 Btu/ft³.

The Btu content of the digester gas shall be calculated by the following equation:

$$\text{Btu/ft}^3 \text{ digester gas} = (\% \text{ CO}_2 \text{ in digester gas})(0 \text{ Btu/ft}^3) + (1 - \% \text{ CO}_2 \text{ in digester gas})(1000 \text{ Btu/ft}^3).$$

The density of the digester gas shall be calculated by the following equation:

$$\text{Density of digester gas} = (\% \text{ CO}_2 \text{ in digester gas})(0.1225 \text{ lb/ft}^3) + (1 - \% \text{ CO}_2 \text{ in digester gas})(0.0446 \text{ lb/ft}^3).$$

*0.1225 lb/ft³ is the density of CO₂

0.0446 lb/ft³ is the density of methane

As a quality control check to determine the accuracy of the Bacharach Fyrite Gas analyzer test method, within 30 days of issuance of this permit and every six months thereafter, the permittee shall collect a grab sample of digester gas to be burned. The samples shall be analyzed in accordance with the appropriate ASTM methods to determine the heat content, in Btu per standard cubic foot, and the density, in lbs/standard cubic foot. If determined necessary by the RAPCA, more frequent testing in accordance with ASTM methods will be required.

2. The permittee shall monitor hydrogen sulfide, within 3 days of issuance of this permit and every 3 days thereafter, by using the Drager or Gastec tubes detection methods. The reliability rating of the Drager or Gastec tubes is +/- 25%. Therefore, to ensure compliance with a hydrogen sulfide concentration of 1007 ppm, hydrogen sulfide readings on the Drager or Gastec tube shall not exceed 806 ppm.

The permittee shall maintain records of all data obtained from the hydrogen sulfide monitoring including, but not limited to, parts per million hydrogen sulfide determined during each test and a record of the daily amount of metal salt added into the anaerobic digester system. The hydrogen sulfide concentrations shall be used to determine the decimal fractions of sulfur for determining compliance with the sulfur dioxide emission limitation. Each measured hydrogen sulfide concentration shall be the average hydrogen sulfide concentration for the measurement day and for each of the two days thereafter (if no additional measurements are taken during the following two days).

C. Monitoring and/or Record Keeping Requirements (continued)

3. The permittee shall collect and record the following information on a daily basis:
 - a. The total quantity of digester gas burned, in cubic feet, in emissions unit B004.
 - b. The total quantity of digester gas burned, in cubic feet, in emissions units P002, P003, P004, B004, B005, B006, B007, B008, and B009 combined, as a 365-day summation.
 - c. The total quantity of natural gas burned, in cubic feet, in emissions unit B004.
 - d. The total quantity of natural gas gas burned, in cubic feet, in emissions units P002, P003, P004, B004, B005, B006, B007, B008, and B009 combined, as a 365-day summation.
 - e. The average decimal fraction of sulfur in the digester gas, by weight.
 - f. The calculated heat content of the digester gas, in Btu per standard cubic foot.
 - g. The calculated density of the digester gas, in lb per standard cubic foot.
 - h. The 365-day rolling summation of the SO₂ emissions rate, in tons, for emissions units P002, P003, P004, B004, B005, B006, B007, B008, and B009, combined, calculated based upon the methodology specified in E.1.c.
 - i. The rolling, 365-day summation of the CO emissions rate, in tons, calculated based upon the methodology outlined in Section E.1.e, for emissions units P002, P003, P004, B004, B005, B006, B007, B008, and B009, combined.
 - j. The rolling 365-day summation of the NO_x emissions rate, in tons, calculated based upon the methodology outlined in Section E.1.d, for emissions units P002, P003, P004, B004, B005, B006, B007, B008, and B009, combined.

4. Within 180 days of the effective date of this permit, the permittee shall develop a written quality assurance/quality control plan for the continuous hydrogen sulfide monitoring system designed to ensure continuous valid and representative readings of hydrogen sulfide. The quality assurance/quality control plan and a logbook dedicated to the continuous hydrogen sulfide monitoring system must be kept on site and be available for inspection during regular office hours.

D. Reporting Requirements

1. The permittee shall submit deviation (excursion) reports that identify each day when a fuel other than natural gas or digester gas was burned in this emissions unit.
2. The permittee shall submit quarterly deviation (excursion) reports which identify all exceedances of the following limitations:
 - a. The daily usage of digester gas (refer to Section B.2);
 - b. The rolling, 365-day sulfur dioxide emissions (refer to Section A.2.a).
 - c. The rolling, 365-day CO emissions (refer to Section A.2.b).
 - d. The rolling, 365-day NO_x emissions (refer to Section A.2.c).
 - e. The hydrogen sulfide content of the digester gas (refer to Section B.3).

These quarterly deviation (excursion) reports shall be submitted in accordance with paragraph (3) of the General Terms and Conditions.

D. Reporting Requirements (continued)

3. The permittee shall submit annual reports which specify the total digester gas usage, the total natural gas usage, and the carbon monoxide, sulfur dioxide, and nitrogen oxide emissions for emissions units B004, B005, B006, B007, B008, B009, P002, P003, and P004, combined. These reports shall be submitted by January 31 of each year.

E. Testing Requirements

- 1.a. Emission Limitation-
5% opacity visible emission limitation, as a six-minute average

Applicable compliance Method-

Compliance shall be determined by visible emission evaluations performed in accordance with OAC rule 3745-17-03(B)(1) using the methods and procedures specified in USEPA Reference Method 9.

- 1.b. Emission Limitation-
0.020 pound particulates/mmBtu

Applicable Compliance Method-

For the use of digester gas, compliance shall be based upon multiplying the hourly gas burning capacity of the emissions unit (0.0277 mm cu.ft./hour) by the adjusted AP-42, Table 1.4-2, (7/98) emission factor for digester gas (1.18 particulate/mm cu ft)* and dividing by the maximum hourly heat input capacity of the emissions unit (6.65 mm Btu/hr). For the use of natural gas, compliance shall be based upon multiplying the hourly gas burning capacity of the emissions unit (0.0065 mm cu.ft./hour) by the AP-42, Table 1.4-2, (7/98), emission factor for natural gas (1.9 lb particulate/mm cu ft) and dividing by the maximum hourly heat input capacity of the emissions unit (6.65 mm Btu/hr). If required, emission testing shall be performed in accordance with USEPA Method 5.

*The AP-42 emission factor for natural gas is adjusted for digester gas by multiplying the factor for natural gas by 1-%CO₂ in digester gas.

- 1.c. Emission Limitation-
99.0 tons/year SO₂ emissions for P002, P003, P004, B004, B005, B006, B007, B008, and B009, combined, as a rolling, 365-day summation

Applicable Compliance Method-

Compliance shall be determined by use of the formula for gaseous fuels in OAC rule 3745-18-04(F)(3):

$$ER = (1 \times 10^6) / H \times D \times S \times 1.998$$

where: ER = the emission rate, in pounds of sulfur dioxide per mmBtu;
H = the heat content of the gaseous fuel, in Btu per standard cubic foot;
D = the density of the gaseous fuel, in pounds per standard cubic foot; and
S = the decimal fraction of sulfur in the gaseous fuel, by weight.*

The daily SO₂ emissions are calculated using the following equation:

$$SO_2 \text{ (tons/day)} = ER \text{ (lbs/mmBtu)} \times \text{Gas Consumption (cu.ft/day)} \times (\text{Btu/cu.ft}) / 2000 \text{ lbs/ton}$$

The rolling, 365-day summation is the sum of the daily SO₂ emission rates for the 365-day period. (The SO₂ emissions from the combustion of natural gas is assumed to be negligible in comparison to the emissions from the digester gas.)

*The Dräger or Gastic tubes read in ppm, by volume. To convert to ppm by weight, multiply by the following ratio: density of H₂S/density of digester gas. The density of H₂S is equal to 0.08672 lb/ft³.

E. Testing Requirements (continued)

- 1.d** Emission Limitation-
83.0 tons/year NO_x for P002, P003, P004, B004, B005, B006, B007, B008, and B009 combined, as a rolling 365-day summation

Applicable Compliance Method-

Compliance shall be determined by the calculation of the rolling 365-day emissions for all emissions units, as determined by the following methodology:

- i. multiply the cubic feet of digester gas burned (cubic feet/day) in emissions units P002, P003, and P004 by the heat value of digester gas as determined in C.1;
- ii. determine the NO_x emissions from P002, P003, and P004 by multiplying the product in (i) by the emission factor in AP-42 Chapter 13.5-1(9/91) of 0.068 lb NO_x/mmBtu;
- iii. multiply the cubic feet of digester gas burned (cubic feet/day) in emissions units B004, B005, and B006 by the heat value of the digester gas as determined in C.1;
- iv. multiply the cubic feet of natural gas burned (cubic feet/day) in emissions units B004, B005, and B006 by the average heat value of natural gas (1000 Btu/cu.ft.);
- v. sum (iii) and (iv);
- vi. determine the NO_x emissions from B004, B005, and B006 by multiplying (v) by the emission factor in AP-42 Chapter 1.4-1(7/98) of 0.98 lb/mmBtu;
- vii. multiply the cubic feet of digester gas burned (cubic feet/day) in emissions units B007, B008, and B009 by the heat value of digester gas as determined in C.1;
- viii. multiply the cubic feet of natural gas burned (cubic feet/day) in emissions units B007, B008, and B009 by the average heat value of natural gas (1000 Btu/cu.ft.);
- ix. sum (vii) and (viii);
- x. determine the NO_x emissions from B007, B008, and B009 by multiplying (ix) by the emission factor in AP-42 Chapter 3.1-1(4/00) of 0.16 lb/mmBtu;
- xi. sum the results from (ii), (vi), and (x);
- xii. sum the results from (xi) for the 365-day period; and
- xiii. divide (xii) by 2000 lbs/ton.

E. Testing Requirements (continued)

- 1.e** Emission Limitation-
99.0 tons/year CO for P002, P003, P004, B004, B005, B006, B007, B008, and B009, combined, as a rolling, 365-day summation

Applicable Compliance Method-

Compliance shall be determined by the calculation of the rolling 365-day emissions for all emissions units, as determined by the following methodology.

- i. multiply the cubic feet of digester gas burned (cubic feet/day) in emissions units P002, P003, and P004 by the heat value of digester gas as determined in C.1;
- ii. determine the CO emissions from P002, P003, and P004 by multiplying the product in (i) by the emission factor in AP-42 Chapter 13.5-1(9/91) of 0.37 lb CO/mmBtu;
- iii. multiply the cubic feet of digester gas burned (cubic feet/day) in emissions units B004, B005, and B006 by the heat value of the digester gas as determined in C.1;
- iv. multiply the cubic feet of natural gas burned (cubic feet/day) in emissions units B004, B005, and B006 by the average heat value of natural gas (1000 Btu/cu.ft.);
- v. sum (iii) and (iv);
- vi. determine the CO emissions from B004, B005, and B006 by multiplying (v) by the emission factor in AP-42 Chapter 1.4-1(7/98) of 0.084 lb/mmBtu;
- vii. multiply the cubic feet of digester gas burned (cubic feet/day) in emissions units B007, B008, and B009 by the heat value of the digester gas as determined in C.1;
- viii. multiply the cubic feet of natural gas burned (cubic feet/day) in emissions units B007, B008, and B009 by the average heat value of the natural gas (1000 Btu/cu.ft.);
- ix. sum (vii) and (viii);
- x. determine the CO emissions from B007, B008, and B009 by multiplying (ix) by the emission factor in AP-42 Chapter 3.1-1(4/00) of 0.017 lbmmBtu;
- xi. sum the results from (ii), (vi), and (x); and
- xii. sum the results from (xi) for the 365-day period; and
- xiii. divide (xii) by 2000 lbs/ton.

F. Miscellaneous Requirements

1. In accordance with OAC rule 3745-35-07, the following sections of this permit are federally enforceable: A - F



State of Ohio Environmental Protection Agency

Street Address:

Mailing Address:

TELE: (614) 644-3020 FAX: (614) 644-2329

08/13/01

CERTIFIED MAIL

RE: Final Chapter 3745-35 Permit To Operate

B007 (Cogen Unit #1)

Internal Combustion Engine, digester or natual gas

City of Dayton Wastewater Treatment Plant (08-57-10-0983)

Thomas Schommer

2800 Guthrie Road

Dayton, OH 45418

Dear Thomas Schommer:

The enclosed Permit(s) to Operate allow you to operate the described emissions unit(s) in the manner indicated in the Permit(s). Because each permit contains several terms and conditions, I urge you to read them carefully.

The Ohio EPA is urging companies to investigate pollution prevention and energy conservation. Not only will this reduce pollution and energy consumption, but it can also save you money. If you would like to learn ways you can save money while protecting the environment, please contact our Office of Pollution Prevention at (614) 644-3469.

You are hereby notified that this action of the Director is final and may be appealed to the Environmental Review Appeals Commission pursuant to Section 3745.04 of the Ohio Revised Code. The appeal must be in writing and set forth the action complained of and the grounds upon which the appeal is based. It must be filed with the Environmental Review Appeals Commission within thirty (30) days after notice of the Director's action. A copy of the appeal must be served on the Director of the Ohio Environmental Protection Agency within three (3) days of filing with the Commission. It is also requested by the Director that a copy of the appeal be served upon the Environmental Enforcement Section of the Office of the Attorney General. An appeal may be filed with the Environmental Review Appeals Commission at the following address:

Environmental Review Appeals Commission
236 East Town Street
Room 300
Columbus, Ohio 43215

If you have any questions, please contact the RAPCA at (937) 225-4435.

Very truly yours,

Thomas G. Rigo, Manager
Field Operations and Permit Section
Division of Air Pollution Control

cc: RAPCA



State of Ohio Environmental Protection Agency

Final Permit To Operate An Emissions Unit

Effective Date: 08/13/01

Expiration Date: 08/13/06

This document constitutes issuance to:

Facility ID: 08-57-10-0983
City of Dayton Wastewater Treatment Plant
2800 Guthrie Rd.
Dayton, OH 45418

of a permit to operate for:

B007 (Cogen Unit #1)
Internal Combustion Engine, digester or natural gas

You will be contacted six months prior to the expiration date regarding the renewal of this permit. If you are not contacted, please contact the appropriate Ohio EPA District Office or local air agency identified below. This permit and the authorization to operate the air contaminant source (emissions unit) at this facility shall expire at midnight on the expiration date shown above. If a renewal permit is not issued prior to the expiration date, the permittee may continue to operate pursuant to OAC Chapter 3745-35 and in accordance with the terms of this permit beyond the expiration date, provided that a complete renewal application is submitted no earlier than eighteen (18) months and no later than one-hundred eighty (180) days prior to the expiration date.

Described below is the Ohio EPA District Office or local air agency that is responsible for processing and administering your Title V permit:

RAPCA
451 West Third Street
PO Box 972
Dayton, OH 45422
(937) 225-4435

This permit is granted subject to the conditions attached hereto.

OHIO ENVIRONMENTAL PROTECTION AGENCY

A handwritten signature in black ink, appearing to read "Christopher Jones", written over a horizontal line.

Christopher Jones
Director

Part I: General Terms and Conditions

1. Compliance Requirements

The above-described emissions unit is and shall remain in full compliance with all applicable State and federal laws and regulations and the terms and conditions of this permit.

2. Permit to Install Requirement

Prior to the "installation" or "modification" of any "air contaminant source," as those terms are defined in OAC rule 3745-31-01, a permit to install must be obtained from the Ohio EPA pursuant to OAC Chapter 3745-31.

3. Reporting Requirements Related to Monitoring and Recordkeeping Requirements

The permittee shall submit required reports in the following manner.

- a. Reports of any required monitoring and/or recordkeeping information shall be submitted to the appropriate Ohio EPA District Office or local air agency.
- b. Except as otherwise may be provided in the terms and conditions for a specific emissions unit, quarterly written reports of (a) any deviations (excursions) from emission limitations, operational restrictions, and control device operating parameter limitations that have been detected by the testing, monitoring, and recordkeeping requirements specified in this permit, (b) the probable cause of such deviations, and (c) any corrective actions or preventive measures which have been or will be taken, shall be submitted to the appropriate Ohio EPA District Office or local air agency. If no deviations occurred during a calendar quarter, the permittee shall submit a quarterly report, which states that no deviations occurred during that quarter. The reports shall be submitted quarterly, i.e., by January 31, April 30, July 31, and October 31 of each year and shall cover the previous calendar quarters. (These quarterly reports shall exclude deviations resulting from malfunctions reported in accordance with OAC rule 3745-15-06.)

4. Records Retention Requirements

Each record of any monitoring data, testing data, and support information required pursuant to this permit shall be retained for a period of five years from the date the record was created. Support information shall include, but not be limited to, all calibration and maintenance records and all original strip-chart recordings for continuous monitoring instrumentation, and copies of all reports required by the permit. Such records may be maintained in computerized form.

5. Inspections and Information Requests

The Director of the Ohio EPA, or an authorized representative of the Director, may, subject to the safety requirements of the permittee and without undue delay, enter upon the premises of this source at any reasonable time for purposes of making inspections, conducting tests, examining records or reports pertaining to any emission of air contaminants, and determining compliance with any applicable State and federal air pollution laws and regulations and the terms and conditions of this permit. The permittee shall furnish to the Director of the Ohio EPA, or an authorized representative of the Director, upon receipt of a written request and within a reasonable time, any information that may be requested to determine whether cause exists for modifying, reopening or revoking this permit or to determine compliance with this permit.

Upon verbal or written request, the permittee shall also furnish to the Director of the Ohio EPA, or an authorized representative of the Director, copies of records required to be kept by this permit.

6. Scheduled Maintenance/Malfunction Reporting

Any scheduled maintenance of air pollution control equipment shall be performed in accordance with paragraph (A) of OAC rule 3745-15-06. The malfunction of any emissions unit or any associated air pollution control system(s) shall be reported to the appropriate Ohio EPA District Office or local air agency in accordance with paragraph (B) of OAC rule 3745-15-06. Except as provided in that rule, any scheduled maintenance or malfunction necessitating the shutdown or bypassing of any air pollution control system(s) shall be accompanied by the shutdown of this emissions unit(s) that is (are) served by such control system(s).

7. Permit Transfers

Any transferee of this permit shall assume the responsibilities of the prior permittee. The appropriate Ohio EPA District Office or local air agency must be notified in writing of any transfer of this permit.

8. Air Pollution Nuisance

The air contaminants emitted by the emissions units covered by this permit shall not cause a public nuisance, in violation of OAC rule 3745-15-07.

9. Permit Renewal

Approximately six months prior to the expiration date of this permit, a notice regarding the renewal of this permit will be sent to the permittee's designated facility contact. If you are not contacted, please contact the following Ohio EPA District Office or local air agency which has jurisdiction in the area in which the facility is located:

RAPCA
451 West Third Street
PO Box 972
Dayton, OH 45422
(937) 225-4435

It is the permittee's responsibility to renew this permit even if no notice of its expiration is received.

Part II: Special Terms and Conditions

A. Applicable Emissions Limitations and/or Control Requirements

1. The specific operation(s), property, and/or equipment which constitute this emissions unit are listed in the following table along with the applicable rules and/or requirements and with the applicable emissions limitations and/or control measures. Emissions from this unit shall not exceed the listed limitations, and the listed control measures shall be employed. Additional applicable emissions limitations and/or control measures (if any) may be specified in narrative form following the table.

<u>Operations, Property, and/or Equipment</u>	<u>Applicable Rules/ Requirements</u>	<u>Applicable Emissions Limitations/Control Measures</u>
Internal Combustion Engine #1	OAC 3745-17-11(B)(5)	0.062 lb particulate emissions/mmBtu of actual heat input
	OAC 3745-31-05(A)(3)	Visible particulate emissions shall not exceed 5% opacity, six-minute average.
	OAC 3745-17-07(A)	The emission limitation specified by this rule is less stringent than the emission limitation established pursuant to OAC rule 3745-31-05(A)(3).
	OAC 3745-35-07(B)(2)	See A.2.a to A.2.c

2. Additional Terms and Conditions

- 2.a The emissions of sulfur dioxide from emissions units P002, P003, P004, B004, B005, B006, B007, B008, and B009, combined, shall not exceed 99.0 tons/year, based on a rolling, 365-day summation.
- 2.b The emissions of carbon monoxide from emissions units P002, P003, P004, B004, B005, B006, B007, B008, and B009, combined, shall not exceed 99.0 tons/year, based on a rolling, 365-day summation.
- 2.c The emissions of nitrogen oxides (NOx) from emissions unit P002, P003, P004, B004, B005, B006, B007, B008, and B009, combined, shall not exceed 83.0 tons/year, based on a rolling, 365-day summation.

B. Operational Restrictions

1. The permittee shall burn only natural gas or digester gas in this emissions unit
2. The maximum amount of digester gas burned in emissions units P002, P003, P004, B004, B005, B006, B007, B008, and B009, combined, shall not exceed 2,800,000 cubic feet/day.
3. The hydrogen sulfide content of the digester gas shall not exceed 1007 ppm, as fired. See Section C.2.
4. Natural gas shall be burned in this emissions unit during start-up and shut-down, and as a supplemental fuel when digester gas is not available.

C. Monitoring and/or Record Keeping Requirements

1. The permittee shall determine daily the CO₂ content of the digester gas by the use of the Bacharach Fyrite Gas analyzer test method. The Btu/ft³ and density values shall be calculated daily by using the percentage of CO₂ in the digester gas and assuming the remainder of the digester gas is methane. The Btu/ft³ of CO₂ is zero, and the Btu/ft³ of methane is assumed to be 1000 Btu/ft³.

The Btu content of the digester gas shall be calculated by the following equation

$$\text{Btu/ft}^3 \text{ digester gas} = (\% \text{ CO}_2 \text{ in digester gas})(0 \text{ Btu/ft}^3) + (1 - \% \text{ CO}_2 \text{ in digester gas})(1000 \text{ Btu/ft}^3)$$

The density of the digester gas shall be calculated by the following equation:

$$\text{Density of digester gas} = (\% \text{ CO}_2 \text{ in digester gas})(0.1225 \text{ lb/ft}^3) + (1 - \% \text{ CO}_2 \text{ in digester gas})(0.0446 \text{ lb/ft}^3)$$

*0.1225 lb/ft³ is the density of CO₂
0.0446 lb/ft³ is the density of methane

As a quality control check to determine the accuracy of the Bacharach Fyrite Gas analyzer test method, within 30 days of issuance of this permit and every six months thereafter, the permittee shall collect a grab sample of digester gas to be burned. The samples shall be analyzed in accordance with the appropriate ASTM methods to determine the heat content, in Btu per standard cubic foot, and the density, in lbs/standard cubic foot. If determined necessary by the RAPCA, more frequent testing in accordance with ASTM methods shall be required.

2. The permittee shall monitor hydrogen sulfide, within 3 days of issuance of this permit and every 3 days thereafter, by using the Drager or Gastec tubes detection methods. The reliability rating of the Drager or Gastec tubes is +/- 25%. Therefore, to ensure compliance with a hydrogen sulfide concentration of 1007 ppm, hydrogen sulfide readings on the Drager or Gastec tube shall not exceed 806 ppm.

The permittee shall maintain records of all data obtained from the hydrogen sulfide monitoring including, but not limited to, parts per million hydrogen sulfide determined during each test and a record of the daily amount of metal salt added into the anaerobic digester system. The hydrogen sulfide concentrations shall be used to determine the decimal fractions of sulfur for determining compliance with the sulfur dioxide emission limitation. Each measured hydrogen sulfide concentration shall be the average hydrogen sulfide concentration for the measurement day and for each of the two days thereafter (if no additional measurements are taken during the following two days).

3. Within 180 days of the effective date of this permit, the permittee shall develop a written quality assurance/quality control plan for the continuous hydrogen sulfide monitoring system designed to ensure continuous valid and representative readings of hydrogen sulfide. The quality assurance/quality control plan and a logbook dedicated to the continuous hydrogen sulfide monitoring system must be kept on site and be available for inspection during regular office hours.

C. Monitoring and/or Record Keeping Requirements (continued)

4. The permittee shall collect and record the following information on a daily basis:
 - a. The total quantity of digester gas burned, in cubic feet, in emissions unit B007.
 - b. The total quantity of digester gas burned, in cubic feet, in emissions units P002, P003, P004, B004, B005, B006, B007, B008, and B009, combined, as a 365-day summation.
 - c. The total quantity of natural gas burned, in cubic feet, in emissions unit B007.
 - d. The total quantity of natural gas burned, in cubic feet, in emissions units P002, P003, P004, B004, B005, B006, B007, B008, and B009, combined, as a 365-day summation.
 - e. The average decimal fraction of sulfur in the digester gas, by weight
 - f. The calculated heat content of the digester gas, in Btu per standard cubic foot
 - g. The calculated density of the digester gas, in lb per standard cubic foot
 - h. The 365-day rolling summation of the SO₂ emission rate, in tons, for emissions units P002, P003, P004, B004, B005, B006, B007, B008, and B009, combined, calculated based upon the methodology specified in E.1.c.
 - i. The rolling, 365-day summation of the CO emission rate, in tons, calculated based upon the methodology specified in Section E.1.e, for emissions units P002, P003, P004, B004, B005, B006, B007, B008, and B009, combined.
 - j. The rolling 365-day summation of the NO_x emission rate, in tons, calculated based upon the methodology specified in Section E.1.d, for emissions units P002, P003, P004, B004, B005, B006, B007, B008, and B009, combined.

D. Reporting Requirements

1. The permittee shall submit deviation (excursion) reports that identify each day when a fuel other than natural gas or digester gas was burned in this emissions unit.
2. The permittee shall submit quarterly deviation (excursion) reports which identify all exceedances of the following limitations:
 - a. The daily usage of digester gas (refer to Section B.4).
 - b. The rolling, 365-day sulfur dioxide emissions (refer to Section A.2.a).
 - c. The rolling, 365-day CO emissions (refer to Section A.2.b).
 - d. The rolling, 365-day NO_x emissions (refer to Section A.2.c).
 - e. The hydrogen sulfide content of the digester gas (refer to Section B.2).

These quarterly deviation (excursion) reports shall be submitted in accordance with paragraph (3) of the General Terms and Conditions.

3. The permittee shall submit annual reports which specify the total natural gas and digester gas usage and the total carbon monoxide, nitrogen oxides, and sulfur dioxide emissions for emissions units B004, B005, B006, B007, B008, B009, P002, P003, and P004, combined. These reports shall be submitted by January 31 of each year.

E. Testing Requirements

- 1.a. Emission Limitation-
5% opacity visible emission limitation, as a six-minute average

Applicable compliance Method-
Compliance shall be determined by visible emission evaluations performed in accordance with OAC rule 3745-17-03(B)(1) using the methods and procedures specified in USEPA Reference Method 9.

- 1.b. Emission Limitation-
0.062 pound particulates/mmBtu

Applicable Compliance Method-
Compliance shall be based upon the emission factor in AP-42 Chapter 3.1-2a. (4/00) of 0.0019 lb/mmBtu. If required, emission testing shall be performed in accordance with USEPA Method 5.

- 1.c Emission Limitation-
99.0 tons/year SO₂ emissions for P002, P003, P004, B004, B005, B006, B007, B008, and B009, combined, as a rolling, 365-day summation

Applicable Compliance Method-
Compliance shall be determined by use of the formula for gaseous fuels in OAC rule 3745-18-04(F)(3):

$$ER = (1 \times 10^6) / H \times D \times S \times 1.998$$

where: ER = the emission rate, in pounds of sulfur dioxide per mmBtu;
H = the heat content of the gaseous fuel, in Btu per standard cubic foot;
D = the density of the gaseous fuel in pounds per standard cubic foot; and
S = the decimal fraction of sulfur in the gaseous fuel, by weight*.

The daily SO₂ emissions are calculated using the following equation.

$$SO_2 \text{ (lbs/day)} = ER \text{ (lbs/mmBtu)} \times \text{Gas Consumption (cu.ft/year)} \times (\text{Btu/cu.ft}) / 2000 \text{ lbs/ton}$$

The rolling, 365-day summation is the sum of the daily SO₂ emission rates for the 365-day period. (The SO₂ emissions from the combustion of natural gas is assumed to be negligible in comparison to the emissions from the digester gas.)

*The Drager or Gastic tubes read in ppm, by volume. To convert to ppm by weight, multiply by the following ratio: density of H₂S/density of digester gas. The density of H₂S is equal to 0.08672 lb/ft³.

E. Testing Requirements (continued)

- 1.d** Emission Limitation-
83.0 tons/year NOx for P002, P003, P004, B004, B005, B006, B007, B008, and B009 combined, as a rolling, 365-day summation

Applicable Compliance Method-

Compliance shall be determined by the calculation of the rolling 365-day emissions for all emissions units, as determined by the following methodology:

- i. multiply the cubic feet of digester gas burned (cubic feet/day) in emissions units P002, P003, and P004 by the heat value of digester gas as determined in C.1;
- ii. determine the NOx emissions from P002, P003, and P004 by multiplying the product in (i) by the emission factor in AP-42 Chapter 13.5-1(9/91) of 0.068 lb NOx/mmBtu.;
- iii. multiply the cubic feet of digester gas burned (cubic feet/day) in emissions units B004, B005, and B006 by the heat value of the digester gas as determined in C.1;
- iv. multiply the cubic feet of natural gas burned (cubic feet/day) in emissions units B004, B005, and B006 by the average heat value of natural gas (1000 Btu/cu.ft.);
- v. sum (iii) and (iv);
- vi. determine the NOx emissions from B004, B005, and B006 by multiplying (v) by the emission factor in AP-42 Chapter 1.4-1(7/98) of 0.98 lb/mmBtu;
- vii. multiply the cubic feet of digester gas burned (cubic feet/day) in emissions units B007, B008, and B009 by the heat value of digester gas as determined in C.1;
- viii. multiply the cubic feet of natural gas burned (cubic feet/day) in emissions units B007, B008, and B009 by the average heat value of natural gas (1000 Btu/cu.ft.);
- ix. sum (vii) and (viii);
- x. determine the NOx emissions from B007, B008, and B009 by multiplying (ix) by the emission factor in AP-42 Chapter 3.1-1(4/00) of 0.16 lb/mmBtu;
- xi. sum the results from (ii), (vi), and (x);
- xii. sum the results from (xi) for the 365-day period; and
- xiii. divide (xii) by 2000 lbs/ton.

E. Testing Requirements (continued)

- 1.e** Emission Limitation-
99.0 tons/year CO for P002, P003, P004, B004, B005, B006, B007, B008, and B009, combined, as a rolling, 365-day summation

Applicable Compliance Method-

Compliance shall be determined by the calculation of the rolling 365-day emissions for all emissions units, as determined by the following methodology.

- i. multiply the cubic feet of digester gas burned (cubic feet/day) in emissions units P002, P003, and P004 by the heat value of digester gas as determined in C.1;
- ii. determine the CO emissions from P002, P003, and P004 by multiplying the product in (i) by the emission factor in AP-42 Chapter 13.5-1(9/91) of 0.37 lb CO/mmBtu.;
- iii. multiply the cubic feet of digester gas burned (cubic feet/day) in emissions units B004, B005, and B006 by the heat value of the digester gas as determined in C.1;
- iv. multiply the cubic feet of natural gas burned (cubic feet/day) in emissions units B004, B005, and B006 by the average heat value of natural gas (1000 Btu/cu.ft.);
- v. sum (iii) and (iv);
- vi. determine the CO emissions from B004, B005, and B006 by multiplying (v) by the emission factor in AP-42 Chapter 1.4-1(7/98) of 0.084 lb/mmBtu;
- vii. multiply the cubic feet of digester gas burned (cubic feet/day) in emissions units B007, B008, and B009 by the heat value of the digester gas as determined in C.1;
- viii. multiply the cubic feet of natural gas burned (cubic feet/day) in emissions units B007, B008, and B009 by the heat value of the natural gas (1000 Btu/cu.ft.);
- ix. sum (vii) and (viii);
- x. determine the CO emissions from B007, B008, and B009 by multiplying (ix) by the emission factor in AP-42 Chapter 3.1-1(4/00) of 0.017 lbmmBtu;
- xi. sum the results from (ii), (vi), and (x); and
- xii. sum the results from (xi) for the 365-day period; and
- xiii. divide (xii) by 2000 lbs/ton.

F. Miscellaneous Requirements

1. In accordance with OAC rule 3745-35-07, the following sections of this permit are federally enforceable: A - F.



State of Ohio Environmental Protection Agency

Street Address:

Lazarus Gov. Center
122 S. Front Street
Columbus, OH 43215

TELE: (614) 644-3020 FAX: (614) 644-2329

Mailing Address

Lazarus Gov. Center
P.O. Box 1049
Columbus, OH 43216-1049

08/13/01

CERTIFIED MAIL

RE: Final Chapter 3745-35 Permit To Operate

B008 (Cogen Unit #2)

Internal Combustion Engine, digester or natural gas

City of Dayton Wastewater Treatment Plant (08-57-10-0983)

Thomas Schommer
2800 Guthrie Road
Dayton, OH 45418

Dear Thomas Schommer:

The enclosed Permit(s) to Operate allow you to operate the described emissions unit(s) in the manner indicated in the Permit(s). Because each permit contains several terms and conditions, I urge you to read them carefully.

The Ohio EPA is urging companies to investigate pollution prevention and energy conservation. Not only will this reduce pollution and energy consumption, but it can also save you money. If you would like to learn ways you can save money while protecting the environment, please contact our Office of Pollution Prevention at (614) 644-3469.

You are hereby notified that this action of the Director is final and may be appealed to the Environmental Review Appeals Commission pursuant to Section 3745.04 of the Ohio Revised Code. The appeal must be in writing and set forth the action complained of and the grounds upon which the appeal is based. It must be filed with the Environmental Review Appeals Commission within thirty (30) days after notice of the Director's action. A copy of the appeal must be served on the Director of the Ohio Environmental Protection Agency within three (3) days of filing with the Commission. It is also requested by the Director that a copy of the appeal be served upon the Environmental Enforcement Section of the Office of the Attorney General. An appeal may be filed with the Environmental Review Appeals Commission at the following address:

Environmental Review Appeals Commission
236 East Town Street
Room 300
Columbus, Ohio 43215

If you have any questions, please contact the RAPCA at (937) 225-4435.

Very truly yours,

Thomas G. Rigo, Manager
Field Operations and Permit Section
Division of Air Pollution Control

cc: RAPCA



State of Ohio Environmental Protection Agency

Final Permit To Operate An Emissions Unit

Effective Date: 08/13/01

Expiration Date: 08/13/06

This document constitutes issuance to:

Facility ID: 08-57-10-0983
City of Dayton Wastewater Treatment Plant
2800 Guthrie Rd.
Dayton, OH 45418

of a permit to operate for:

B008 (Cogen Unit #2)
Internal Combustion Engine, digester or natural gas

You will be contacted six months prior to the expiration date regarding the renewal of this permit. If you are not contacted, please contact the appropriate Ohio EPA District Office or local air agency identified below. This permit and the authorization to operate the air contaminant source (emissions unit) at this facility shall expire at midnight on the expiration date shown above. If a renewal permit is not issued prior to the expiration date, the permittee may continue to operate pursuant to OAC Chapter 3745-35 and in accordance with the terms of this permit beyond the expiration date, provided that a complete renewal application is submitted no earlier than eighteen (18) months and no later than one-hundred eighty (180) days prior to the expiration date.

Described below is the Ohio EPA District Office or local air agency that is responsible for processing and administering your Title V permit:

RAPCA
451 West Third Street
PO Box 972
Dayton, OH 45422
(937) 225-4435

This permit is granted subject to the conditions attached hereto

OHIO ENVIRONMENTAL PROTECTION AGENCY

A handwritten signature in black ink, appearing to read "Christopher Jones", written over a horizontal line.

Christopher Jones
Director

Part I: General Terms and Conditions

1. Compliance Requirements

The above-described emissions unit is and shall remain in full compliance with all applicable State and federal laws and regulations and the terms and conditions of this permit.

2. Permit to Install Requirement

Prior to the "installation" or "modification" of any "air contaminant source," as those terms are defined in OAC rule 3745-31-01, a permit to install must be obtained from the Ohio EPA pursuant to OAC Chapter 3745-31.

3. Reporting Requirements Related to Monitoring and Recordkeeping Requirements

The permittee shall submit required reports in the following manner:

- a. Reports of any required monitoring and/or recordkeeping information shall be submitted to the appropriate Ohio EPA District Office or local air agency.
- b. Except as otherwise may be provided in the terms and conditions for a specific emissions unit, quarterly written reports of (a) any deviations (excursions) from emission limitations, operational restrictions, and control device operating parameter limitations that have been detected by the testing, monitoring, and recordkeeping requirements specified in this permit, (b) the probable cause of such deviations, and (c) any corrective actions or preventive measures which have been or will be taken, shall be submitted to the appropriate Ohio EPA District Office or local air agency. If no deviations occurred during a calendar quarter, the permittee shall submit a quarterly report, which states that no deviations occurred during that quarter. The reports shall be submitted quarterly, i.e., by January 31, April 30, July 31, and October 31 of each year and shall cover the previous calendar quarters. (These quarterly reports shall exclude deviations resulting from malfunctions reported in accordance with OAC rule 3745-15-06.)

4. Records Retention Requirements

Each record of any monitoring data, testing data, and support information required pursuant to this permit shall be retained for a period of five years from the date the record was created. Support information shall include, but not be limited to, all calibration and maintenance records and all original strip-chart recordings for continuous monitoring instrumentation, and copies of all reports required by the permit. Such records may be maintained in computerized form.

5. Inspections and Information Requests

The Director of the Ohio EPA, or an authorized representative of the Director, may, subject to the safety requirements of the permittee and without undue delay, enter upon the premises of this source at any reasonable time for purposes of making inspections, conducting tests, examining records or reports pertaining to any emission of air contaminants, and determining compliance with any applicable State and federal air pollution laws and regulations and the terms and conditions of this permit. The permittee shall furnish to the Director of the Ohio EPA, or an authorized representative of the Director, upon receipt of a written request and within a reasonable time, any information that may be requested to determine whether cause exists for modifying, reopening or revoking this permit or to determine compliance with this permit.

Upon verbal or written request, the permittee shall also furnish to the Director of the Ohio EPA, or an authorized representative of the Director, copies of records required to be kept by this permit.

6. Scheduled Maintenance/Malfunction Reporting

Any scheduled maintenance of air pollution control equipment shall be performed in accordance with paragraph (A) of OAC rule 3745-15-06. The malfunction of any emissions unit or any associated air pollution control system(s) shall be reported to the appropriate Ohio EPA District Office or local air agency in accordance with paragraph (B) of OAC rule 3745-15-06. Except as provided in that rule, any scheduled maintenance or malfunction necessitating the shutdown or bypassing of any air pollution control system(s) shall be accompanied by the shutdown of this emissions unit(s) that is (are) served by such control system(s).

7. Permit Transfers

Any transferee of this permit shall assume the responsibilities of the prior permittee. The appropriate Ohio EPA District Office or local air agency must be notified in writing of any transfer of this permit.

8. Air Pollution Nuisance

The air contaminants emitted by the emissions units covered by this permit shall not cause a public nuisance, in violation of OAC rule 3745-15-07.

9. Permit Renewal

Approximately six months prior to the expiration date of this permit, a notice regarding the renewal of this permit will be sent to the permittee's designated facility contact. If you are not contacted, please contact the following Ohio EPA District Office or local air agency which has jurisdiction in the area in which the facility is located:

RAPCA
451 West Third Street
PO Box 972
Dayton, OH 45422
(937) 225-4435

It is the permittee's responsibility to renew this permit even if no notice of its expiration is received.

Part II: Special Terms and Conditions

A. Applicable Emissions Limitations and/or Control Requirements

1. The specific operation(s), property, and/or equipment which constitute this emissions unit are listed in the following table along with the applicable rules and/or requirements and with the applicable emissions limitations and/or control measures. Emissions from this unit shall not exceed the listed limitations, and the listed control measures shall be employed. Additional applicable emissions limitations and/or control measures (if any) may be specified in narrative form following the table.

<u>Operations, Property, and/or Equipment</u>	<u>Applicable Rules/ Requirements</u>	<u>Applicable Emissions Limitations/Control Measures</u>
Internal Combustion Engine #2,	OAC 3745-17-11(B)(5)	0.062 lb particulate emissions/mmBtu of actual heat input
	OAC 3745-31-05(A)(3)	Visible particulate emissions shall not exceed 5% opacity, six-minute average.
	OAC 3745-17-07(A)	The emission limitation specified by this rule is less stringent than the emission limitation established pursuant to OAC rule 3745-31-05(A)(3).
	OAC 3745-35-07(B)(2)	See A.2.a to A.2.c

2. Additional Terms and Conditions

- 2.a The emissions of sulfur dioxide from emissions units P002, P003, P004, B004, B005, B006, B007, B008, and B009, combined, shall not exceed 99.0 tons/year, based on a rolling, 365-day summation.
- 2.b The emissions of carbon monoxide from emissions units P002, P003, P004, B004, B005, B006, B007, B008, and B009, combined, shall not exceed 99.0 tons/year, based on a rolling, 365-day summation.
- 2.c The emissions of nitrogen oxides (NOx) from emissions unit P002, P003, P004, B004, B005, B006, B007, B008, and B009, combined, shall not exceed 83.0 tons/year, based on a rolling, 365-day summation.

B. Operational Restrictions

1. The permittee shall burn only natural gas or digester gas in this emissions unit
2. The maximum amount of digester gas burned in emissions units P002, P003, P004, B004, B005, B006, B007, B008, and B009, combined, shall not exceed 2,800,000 cubic feet/day.
3. The hydrogen sulfide content of the digester gas shall not exceed 1007 ppm, as fired. See Section C.2.
4. Natural gas shall be burned in this emissions unit during start-up and shutdown, and as a supplemental fuel when digester gas is not available.

C Monitoring and/or Record Keeping Requirements

1. The permittee shall determine daily the CO₂ content of the digester gas by the use of the Bacharach Fyrite Gas analyzer test method. The Btu/ft³ and density values shall be calculated daily by using the percentage of CO₂ in the digester gas and assuming the remainder of the digester gas is methane. The Btu/ft³ of CO₂ is zero, and the Btu/ft³ of methane is assumed to be 1000 Btu/ft³.

The Btu content of the digester gas shall be calculated by the following equation.

$$\text{Btu/ft}^3 \text{ digester gas} = (\% \text{ CO}_2 \text{ in digester gas})(0 \text{ Btu/ft}^3) + (1 - \% \text{ CO}_2 \text{ in digester gas})(1000 \text{ Btu/ft}^3).$$

The density of the digester gas shall be calculated by the following equation:

$$\text{Density of digester gas} = (\% \text{ CO}_2 \text{ in digester gas})(0.1225 \text{ lb/ft}^3) + (1 - \% \text{ CO}_2 \text{ in digester gas})(0.0446 \text{ lb/ft}^3)$$

*0.1225 lb/ft³ is the density of CO₂

0.0446 lb/ft³ is the density of methane

As a quality control check to determine the accuracy of the Bacharach Fyrite Gas analyzer test method, within 30 days of issuance of this permit and every six months thereafter, the permittee shall collect a grab sample of digester gas to be burned. The samples shall be analyzed in accordance with the appropriate ASTM methods to determine the heat content, in Btu per standard cubic foot, and the density, in lbs/standard cubic foot. If determined necessary by the RAPCA, more frequent testing in accordance with ASTM methods shall be required.

2. The permittee shall monitor hydrogen sulfide, within 3 days of issuance of this permit and every 3 days thereafter, by using the Drager or Gastec tubes detection methods. The reliability rating of the Drager or Gastec tubes is +/- 25%. Therefore, to ensure compliance with a hydrogen sulfide concentration of 1007 ppm hydrogen sulfide readings on the Drager or Gastec tube shall not exceed 806 ppm.

The permittee shall maintain records of all data obtained from the hydrogen sulfide monitoring including, but not limited to, parts per million hydrogen sulfide determined during each test and a record of the daily amount of metal salt added into the anaerobic digester system. The hydrogen sulfide concentrations shall be used to determine the decimal fractions of sulfur for determining compliance with the sulfur dioxide emission limitation. Each measured hydrogen sulfide concentration shall be considered to be the average hydrogen sulfide concentration for the measurement day and for each of the two days thereafter (if no additional measurements are taken during the following two days).

3. Within 180 days of the effective date of this permit, the permittee shall develop a written quality assurance/quality control plan for the continuous hydrogen sulfide monitoring system designed to ensure continuous valid and representative readings of hydrogen sulfide. The quality assurance/quality control plan and a logbook dedicated to the continuous hydrogen sulfide monitoring system must be kept on site and be available for inspection during regular office hours.

C. Monitoring and/or Record Keeping Requirements (continued)

4. The permittee shall collect and record the following information on a daily basis:
 - a. The total quantity of digester gas burned, in cubic feet, in emissions unit B008.
 - b. The total quantity of digester gas burned, in cubic feet, in emissions units P002, P003, P004, B004, B005, B006, B007, B008, and B009, combined, as a 365-day summation.
 - c. The total quantity of natural gas burned, in cubic feet, in emissions unit B008
 - d. The total quantity of natural gas burned, in cubic feet, in emissions units P002, P003, P004, B004, B005, B006, B007, B008, and B009 combined, as a 365-day summation.
 - e. The average decimal fraction of sulfur in the digester gas, by weight
 - f. The calculated heat content of the digester gas, in Btu per standard cubic foot
 - g. The calculated density of the digester gas, in lb per standard cubic foot
 - h. The 365-day rolling summation of the SO₂ emission rate, in tons, for emissions units P002, P003, P004, B004, B005, B006, B007, B008, and B009, combined, calculated based upon the methodology specified in E.1.c.
 - i. The rolling, 365-day summation of the CO emission rate, in tons, calculated based upon the methodology specified in Section E.1.e, for emissions units P002, P003, P004, B004, B005, B006, B007, B008, and B009, combined.
 - j. The rolling 365-day summation of the NO_x emission rate, in tons, calculated based upon the methodology specified in Section E.1.d, for emissions units P002, P003, P004, B004, B005, B006, B007, B008, and B009, combined.

D. Reporting Requirements

1. The permittee shall submit quarterly deviation (excursion) reports that identify each day when a fuel other than natural gas or digester gas was burned in this emissions unit.
2. The permittee shall submit quarterly deviation (excursion) reports which identify all exceedances of the following limitations:
 - a. The daily usage of digester gas (refer to Section B.4);
 - b. The rolling, 365-day sulfur dioxide emissions (reference Section A.2.a).
 - c. The rolling, 365-day CO emissions (refer to Section A.2.b).
 - d. The rolling, 365-day NO_x emissions (refer to Section A.2.c).
 - e. The hydrogen sulfide content of the digester gas (refer to Section B.3).

These quarterly deviation (excursion) reports shall be submitted in accordance with paragraph (3) of the General Terms and Conditions.

3. The permittee shall submit annual reports which specify the total natural gas and digester gas usage and the total carbon monoxide, nitrogen oxides, and sulfur dioxide emissions for emissions units B004, B005, B006, B007, B008, B009, P002, P003, and P004, combined. These reports shall be submitted by January 31 of each year.

E. Testing Requirements

- 1.a** Emission Limitation-
5% opacity visible emission limitation, as a six-minute average

Applicable compliance Method-
Compliance shall be determined by visible emission evaluations performed in accordance with OAC rule 3745-17-03(B)(1) using the methods and procedures specified in USEPA Reference Method 9.

- 1.b** Emission Limitation-
0.062 pound particulates/mmBtu

Applicable Compliance Method-
Compliance shall be based upon the emission factor in AP-42 Chapter 3.1-2a. (4/00) of 0.0019 lb/mmBtu. If required, emission testing shall be performed in accordance with Method 5.

- 1.c** Emission Limitation-
99.0 tons/year SO₂ emissions for P002, P003, P004, B004, B005, B006, B007, B008, and B009, combined, as a rolling, 365-day summation

Applicable Compliance Method-
Compliance shall be determined by use of the formula for gaseous fuels in OAC rule 3745-18-04(F)(3)

$$ER = (1 \times 10^6) / H \times D \times S \times 1.998$$

where: ER = the emission rate, in pounds of sulfur dioxide per mmBtu;
H = the heat content of the gaseous fuel, in Btu per standard cubic foot;
D = the density of the gaseous fuel, in pounds per standard cubic foot; and
S = the decimal fraction of sulfur in the gaseous fuel, by weight.*

The daily SO₂ emissions are calculated using the following equation.

$$SO_2 \text{ (lbs/day)} = ER \text{ (lbs/mmBtu)} \times \text{Gas Consumption (cu.ft/day)} \times (Btu/cu.ft) / 2000 \text{ lbs/ton}$$

The rolling, 365-day summation is the sum of the daily SO₂ emission rates for the 365-day period. (The SO₂ emissions from the combustion of natural gas is assumed to be negligible in comparison to the emissions from the digester gas.)

*The Drager or Gastic tubes read in ppm, by volume. To convert to ppm by weight, multiply by the following ratio: density of H₂S/density of digester gas. The density of H₂S is equal to 0.08672 lb/ft³

E. Testing Requirements (continued)

- 1.d** Emission Limitation-
83.0 tons/year NOx for P002, P003, P004, B004, B005, B006, B007, B008, and B009 combined, as a rolling 365-day summation

Applicable Compliance Method-

Compliance shall be determined by the calculation of the rolling 365-day emissions for all emissions units, as determined by the following methodology:

- i. multiply the cubic feet of digester gas burned (cubic feet/day) in emissions units P002, P003, and P004 by the heat value of digester gas as determined in C.1;
- ii. determine the NOx emissions from P002, P003, and P004 by multiplying the product in (i) by the emission factor in AP-42 Chapter 13.5-1(9/91) of 0.068 lb NOx/mmBtu.;
- iii. multiply the cubic feet of digester gas burned (cubic feet/day) in emissions units B004, B005, and B006 by the heat value of the digester gas as determined in C.1;
- iv. multiply the cubic feet of natural gas burned (cubic feet/day) in emissions units B004, B005, and B006 by the average heat value of natural gas (1000 Btu/cu.ft.);
- v. sum (iii) and (iv);
- vi. determine the NOx emissions from B004, B005, and B006 by multiplying (v) by the emission factor in AP-42 Chapter 1.4-1(7/98) of 0.98 lb/mmBtu;
- vii. multiply the cubic feet of digester gas burned (cubic feet/day) in emissions units B007, B008, and B009 by the heat value of digester gas as determined in C.1;
- viii. multiply the cubic feet of natural gas burned (cubic feet/day) in emissions units B007, B008, and B009 by the average heat value of natural gas (1000 Btu/cu.ft.);
- ix. sum (vii) and (viii);
- x. determine the NOx emissions from B007, B008, and B009 by multiplying (ix) by the emission factor in AP-42 Chapter 3.1-1(4/00) of 0.16 lb/mmBtu;
- xi. sum the results from (ii), (vi), and (x);
- xii. sum the results from (xi) for the 365-day period; and
- xiii. divide (xii) by 2000 lbs/ton.

E. Testing Requirements (continued)

- 1.e** Emission Limitation-
99.0 tons/year CO for P002, P003, P004, B004, B005, B006, B007, B008, and B009, combined, as a rolling, 365-day summation

Applicable Compliance Method-

Compliance shall be determined by the calculation of the rolling 365-day emissions for all emissions units, as determined by the following methodology.

- i. multiply the cubic feet of digester gas burned (cubic feet/day) in emissions units P002, P003, and P004 by the heat value of digester gas as determined in C.1;
- ii. determine the CO emissions from P002, P003, and P004 by multiplying the product in (i) by the emission factor in AP-42 Chapter 13.5-1(9/91) of 0.37 lb CO/mmBtu.;
- iii. multiply the cubic feet of digester gas burned (cubic feet/day) in emissions units B004, B005, and B006 by the heat value of the digester gas as determined in C.1;
- iv. multiply the cubic feet of natural gas burned (cubic feet/day) in emissions units B004, B005, and B006 by the average heat value of natural gas (1000 Btu/cu.ft.);
- v. sum (iii) and (iv);
- vi. determine the CO emissions from B004, B005, and B006 by multiplying (v) by the emission factor in AP-42 Chapter 1.4-1(7/98) of 0.084 lb/mmBtu;
- vii. multiply the cubic feet of digester gas burned (cubic feet/day) in emissions units B007, B008, and B009 by the heat value of the digester gas as determined in C.1;
- viii. multiply the cubic feet of natural gas burned (cubic feet/day) in emissions units B007, B008, and B009 by the heat value of the natural gas (1000 Btu/cu.ft.);
- ix. sum (vii) and (viii);
- x. determine the CO emissions from B007, B008, and B009 by multiplying (ix) by the emission factor in AP-42 Chapter 3.1-1(4/00) of 0.017 lbmmBtu;
- xi. sum the results from (ii), (vi), and (x); and
- xii. sum the results from (xi) for the 365-day period; and
- xiii. divide (xii) by 2000 lbs/ton.

F. Miscellaneous Requirements

1. In accordance with OAC rule 3745-35-07, the following sections of this permit are federally enforceable: A - F



State of Ohio Environmental Protection Agency

Street Address:

Mailing Address:

TELE: (614) 644-3020 FAX: (614) 644-2329

08/13/01

CERTIFIED MAIL

RE: Final Chapter 3745-35 Permit To Operate

B009 (Cogen Unit #3)

Internal Combustion Engine, digester or natural gas

City of Dayton Wastewater Treatment Plant (08-57-10-0983)

Thomas Schommer

2800 Guthrie Road

Dayton, OH 45418

Dear Thomas Schommer

The enclosed Permit(s) to Operate allow you to operate the described emissions unit(s) in the manner indicated in the Permit(s). Because each permit contains several terms and conditions, I urge you to read them carefully.

The Ohio EPA is urging companies to investigate pollution prevention and energy conservation. Not only will this reduce pollution and energy consumption, but it can also save you money. If you would like to learn ways you can save money while protecting the environment, please contact our Office of Pollution Prevention at (614) 644-3469.

You are hereby notified that this action of the Director is final and may be appealed to the Environmental Review Appeals Commission pursuant to Section 3745.04 of the Ohio Revised Code. The appeal must be in writing and set forth the action complained of and the grounds upon which the appeal is based. It must be filed with the Environmental Review Appeals Commission within thirty (30) days after notice of the Director's action. A copy of the appeal must be served on the Director of the Ohio Environmental Protection Agency within three (3) days of filing with the Commission. It is also requested by the Director that a copy of the appeal be served upon the Environmental Enforcement Section of the Office of the Attorney General. An appeal may be filed with the Environmental Review Appeals Commission at the following address:

Environmental Review Appeals Commission
236 East Town Street
Room 300
Columbus, Ohio 43215

If you have any questions, please contact the RAPCA at (937) 225-4435

Very truly yours,

Thomas G. Rigo, Manager
Field Operations and Permit Section
Division of Air Pollution Control

cc: RAPCA



State of Ohio Environmental Protection Agency

Final Permit To Operate An Emissions Unit

Effective Date: 08/13/01

Expiration Date: 08/13/06

This document constitutes issuance to:

Facility ID: 08-57-10-0983
City of Dayton Wastewater Treatment Plant
2800 Guthrie Rd.
Dayton, OH 45418

of a permit to operate for:

B009 (Cogen Unit #3)
Internal Combustion Engine, digester or natural gas

You will be contacted six months prior to the expiration date regarding the renewal of this permit. If you are not contacted, please contact the appropriate Ohio EPA District Office or local air agency identified below. This permit and the authorization to operate the air contaminant source (emissions unit) at this facility shall expire at midnight on the expiration date shown above. If a renewal permit is not issued prior to the expiration date, the permittee may continue to operate pursuant to OAC Chapter 3745-35 and in accordance with the terms of this permit beyond the expiration date, provided that a complete renewal application is submitted no earlier than eighteen (18) months and no later than one-hundred eighty (180) days prior to the expiration date.

Described below is the Ohio EPA District Office or local air agency that is responsible for processing and administering your Title V permit:

RAPCA
451 West Third Street
PO Box 972
Dayton, OH 45422
(937) 225-4435

This permit is granted subject to the conditions attached hereto

OHIO ENVIRONMENTAL PROTECTION AGENCY

A handwritten signature in black ink, appearing to read "Christopher Jones", written over a horizontal line.

Christopher Jones
Director

Part I: General Terms and Conditions

1 Compliance Requirements

The above-described emissions unit is and shall remain in full compliance with all applicable State and federal laws and regulations and the terms and conditions of this permit.

2. Permit to Install Requirement

Prior to the "installation" or "modification" of any "air contaminant source," as those terms are defined in OAC rule 3745-31-01, a permit to install must be obtained from the Ohio EPA pursuant to OAC Chapter 3745-31.

3. Reporting Requirements Related to Monitoring and Recordkeeping Requirements

The permittee shall submit required reports in the following manner:

- a Reports of any required monitoring and/or recordkeeping information shall be submitted to the appropriate Ohio EPA District Office or local air agency.
- b Except as otherwise may be provided in the terms and conditions for a specific emissions unit, quarterly written reports of (a) any deviations (excursions) from emission limitations, operational restrictions, and control device operating parameter limitations that have been detected by the testing, monitoring, and recordkeeping requirements specified in this permit, (b) the probable cause of such deviations, and (c) any corrective actions or preventive measures which have been or will be taken, shall be submitted to the appropriate Ohio EPA District Office or local air agency. If no deviations occurred during a calendar quarter, the permittee shall submit a quarterly report, which states that no deviations occurred during that quarter. The reports shall be submitted quarterly, i.e., by January 31, April 30, July 31, and October 31 of each year and shall cover the previous calendar quarters. (These quarterly reports shall exclude deviations resulting from malfunctions reported in accordance with OAC rule 3745-15-06.)

4. Records Retention Requirements

Each record of any monitoring data, testing data, and support information required pursuant to this permit shall be retained for a period of five years from the date the record was created. Support information shall include, but not be limited to, all calibration and maintenance records and all original strip-chart recordings for continuous monitoring instrumentation, and copies of all reports required by the permit. Such records may be maintained in computerized form.

5. Inspections and Information Requests

The Director of the Ohio EPA, or an authorized representative of the Director, may, subject to the safety requirements of the permittee and without undue delay, enter upon the premises of this source at any reasonable time for purposes of making inspections, conducting tests, examining records or reports pertaining to any emission of air contaminants, and determining compliance with any applicable State and federal air pollution laws and regulations and the terms and conditions of this permit. The permittee shall furnish to the Director of the Ohio EPA, or an authorized representative of the Director, upon receipt of a written request and within a reasonable time, any information that may be requested to determine whether cause exists for modifying, reopening or revoking this permit or to determine compliance with this permit.

Upon verbal or written request, the permittee shall also furnish to the Director of the Ohio EPA, or an authorized representative of the Director, copies of records required to be kept by this permit.

6. Scheduled Maintenance/Malfunction Reporting

Any scheduled maintenance of air pollution control equipment shall be performed in accordance with paragraph (A) of OAC rule 3745-15-06. The malfunction of any emissions unit or any associated air pollution control system(s) shall be reported to the appropriate Ohio EPA District Office or local air agency in accordance with paragraph (B) of OAC rule 3745-15-06. Except as provided in that rule, any scheduled maintenance or malfunction necessitating the shutdown or bypassing of any air pollution control system(s) shall be accompanied by the shutdown of this emissions unit(s) that is (are) served by such control system(s).

7. Permit Transfers

Any transferee of this permit shall assume the responsibilities of the prior permittee. The appropriate Ohio EPA District Office or local air agency must be notified in writing of any transfer of this permit.

8. Air Pollution Nuisance

The air contaminants emitted by the emissions units covered by this permit shall not cause a public nuisance, in violation of OAC rule 3745-15-07.

9. Permit Renewal

Approximately six months prior to the expiration date of this permit, a notice regarding the renewal of this permit will be sent to the permittee's designated facility contact. If you are not contacted, please contact the following Ohio EPA District Office or local air agency which has jurisdiction in the area in which the facility is located:

RAPCA
451 West Third Street
PO Box 972
Dayton, OH 45422
(937) 225-4435

It is the permittee's responsibility to renew this permit even if no notice of its expiration is received.

Part II: Special Terms and Conditions

A. Applicable Emissions Limitations and/or Control Requirements

1. The specific operation(s), property, and/or equipment which constitute this emissions unit are listed in the following table along with the applicable rules and/or requirements and with the applicable emissions limitations and/or control measures. Emissions from this unit shall not exceed the listed limitations, and the listed control measures shall be employed. Additional applicable emissions limitations and/or control measures (if any) may be specified in narrative form following the table.

<u>Operations, Property, and/or Equipment</u>	<u>Applicable Rules/ Requirements</u>	<u>Applicable Emissions Limitations/Control Measures</u>
Internal Combustion Engine #3	OAC 3745-17-11(B)(5)	0.062 lb particulate emissions/mmBtu of actual heat input
	OAC 3745-31-05(A)(3)	Visible particulate emissions shall not exceed 5% opacity, six-minute average.
	OAC 3745-17-07(A)	The emission limitation specified by this rule is less stringent than the emission limitation established pursuant to OAC rule 3745-31-05(A)(3).
	OAC 3745-35-07(B)(2)	See A.2.a to A.2.c

2. Additional Terms and Conditions

- 2.a The emissions of sulfur dioxide from emissions units P002, P003, P004, B004, B005, B006, B007, B008, and B009, combined, shall not exceed 99.0 tons/year, based on a rolling, 365-day summation.
- 2.b The emissions of carbon monoxide from emissions units P002, P003, P004, B004, B005, B006, B007, B008, and B009, combined, shall not exceed 99.0 tons/year, based on a rolling, 365-day summation.
- 2.c The emissions of nitrogen oxides (NOx) from emissions unit P002, P003, P004, B004, B005, B006, B007, B008, and B009, combined, shall not exceed 83.0 tons/year, based on a rolling, 365-day summation.

B. Operational Restrictions

1. The permittee shall burn only natural gas or digester gas in this emissions unit.
2. The maximum amount of digester gas burned in emissions units P002, P003, P004, B004, B005, B006, B007, B008, and B009, combined, shall not exceed 2,800,000 cubic feet.
3. The hydrogen sulfide content of the digester gas shall not exceed 1007 ppm, as fired. See Section C.3.
4. Natural gas shall be burned in this emissions unit during start-up and shutdown, and as a supplemental fuel when digester gas is not available.

C. Monitoring and/or Record Keeping Requirements

1. The permittee shall determine daily the CO₂ content of the digester gas by the use of the Bacharach Fyrite Gas analyzer test method. The Btu/ft³ and density values shall be calculated daily by using the percentage of CO₂ in the digester gas and assuming the remainder of the digester gas is methane. The Btu/ft³ of CO₂ is zero, and the Btu/ft³ of methane is assumed to be 1000 Btu/ft³.

The Btu content of the digester gas shall be calculated by the following equation.

$$\text{Btu/ft}^3 \text{ digester gas} = (\% \text{ CO}_2 \text{ in digester gas})(0 \text{ Btu/ft}^3) + (1 - \% \text{ CO}_2 \text{ in digester gas})(1000 \text{ Btu/ft}^3).$$

The density of the digester gas shall be calculated by the following equation.

$$\text{Density of digester gas} = (\% \text{ CO}_2 \text{ in digester gas})(0.1225 \text{ lb/ft}^3) + (1 - \% \text{ CO}_2 \text{ in digester gas})(0.0446 \text{ lb/ft}^3).$$

*0.1225 lb/ft³ is the density of CO₂

0.0446 lb/ft³ is the density of methane

As a quality control check to determine the accuracy of the Bacharach Fyrite Gas analyzer test method, within 30 days of issuance of this permit and every six months thereafter, the permittee shall collect a grab sample of digester gas to be burned. The samples shall be analyzed in accordance with the appropriate ASTM methods to determine the heat content, in Btu per standard cubic foot, and the density, in lbs/standard cubic foot. If determined necessary by the RAPCA, more frequent testing in accordance with ASTM methods shall be required.

2. The permittee shall monitor hydrogen sulfide, within 3 days of issuance of this permit and every 3 days thereafter, by using the Drager or Gastec tubes detection methods. The reliability rating of the Drager or Gastec tubes is +/- 25%. Therefore, to ensure compliance with a hydrogen sulfide concentration of 1007 ppm, hydrogen sulfide readings on the Drager or Gastec tube shall not exceed 806 ppm.

The permittee shall maintain records of all data obtained from the hydrogen sulfide monitoring including, but not limited to, parts per million hydrogen sulfide determined during each test and a record of the daily amount of metal salt added into the anaerobic digester system. The hydrogen sulfide concentrations shall be used to determine the decimal fractions of sulfur for determining compliance with the sulfur dioxide emission limitation. Each measured hydrogen sulfide concentration shall be considered to be the average hydrogen sulfide concentration for the measurement day and for each of the two days thereafter (if no additional measurements are taken during the following two days).

3. Within 180 days of the effective date of this permit, the permittee shall develop a written quality assurance/quality control plan for the continuous hydrogen sulfide monitoring system designed to ensure continuous valid and representative readings of hydrogen sulfide. The quality assurance/quality control plan and a logbook dedicated to the continuous hydrogen sulfide monitoring system must be kept on site and be available for inspection during regular office hours.

C Monitoring and/or Record Keeping Requirements (continued)

4. The permittee shall collect and record the following information on a daily basis:
 - a. The total quantity of digester gas burned, in cubic feet, in emissions unit B009.
 - b. The total quantity of digester gas burned, in cubic feet, in emissions units P002, P003, P004, B004, B005, B006, B007, B008, and B009, combined, as a 365-day summation.
 - c. The total quantity of natural gas burned, in cubic feet, in emissions unit B009.
 - d. The total quantity of natural gas gas burned, in cubic feet, in emissions units P002, P003, P004, B004, B005, B006, B007, B008, and B009, combined, as a 365-day summation.
 - e. The average decimal fraction of sulfur in the digester gas, by weight.
 - f. The calculated heat content of the digester gas, in Btu per standard cubic foot.
 - g. The calculated density of the digester gas, in lb per standard cubic foot.
 - h. The 365-day rolling summation of the SO₂ emission rate, in tons, for emissions units P002, P003, P004, B004, B005, B006, B007, B008, and B009, combined, calculated based upon the methodology specified in E.1.c.
 - i. The rolling, 365-day summation of the CO emission rate, in tons, calculated based upon the methodology specified in Section E.1.e, for emissions units P002, P003, P004, B004, B005, B006, B007, B008, and B009, combined.
 - j. The rolling 365-day summation of the NO_x emission rate, in tons, calculated based upon the methodology specified in Section E.1.d, for emissions units P002, P003, P004, B004, B005, B006, B007, B008, and B009, combined.

D. Reporting Requirements

1. The permittee shall submit deviation (excursion) reports that identify each day when a fuel other than natural gas or digester gas was burned in this emissions unit.
2. The permittee shall submit quarterly deviation (excursion) reports which identify all exceedances of the following limitations:
 - a. The daily usage of digester gas, in cubic feet, in emissions units P002, P003, P004, B004, B005, B006, B007, B008, and B009, combined.
 - b. The rolling, 365-day sulfur dioxide emissions (reference Section A.2.a).
 - c. The rolling, 365-day CO emissions (reference Section A.2.b).
 - d. The rolling, 365-day NO_x emissions (reference Section A.2.c).
 - e. The hydrogen sulfide content of the digester gas (reference to Section B.3).

These quarterly deviation (excursion) reports shall be submitted in accordance with paragraph (3) of the General Terms and Conditions.

3. The permittee shall submit annual reports which specify the total natural gas and digester gas usage, and the total carbon monoxide, nitrogen oxides, and sulfur dioxide emissions for emissions units B004, B005, B006, B007, B008, B009, P002, P003, and P004, combined. These reports shall be submitted by January 31 of each year.

E. Testing Requirements

- 1.a** Emission Limitation-
5% opacity visible emission limitation, as a six-minute average

Applicable compliance Method-

Compliance shall be determined by visible emission evaluations performed in accordance with OAC rule 3745-17-03(B)(1) using the methods and procedures specified in USEPA Reference Method 9.

- 1.b** Emission Limitation-
0.062 pound particulates/mmBtu

Applicable Compliance Method-

Compliance shall be based upon the emission factor in AP-42 Chapter 3.1-2a. (4/00) of 0.0019 lb/mmBtu. If required, emission testing shall be performed in accordance with USEPA Method 5.

- 1.c** Emission Limitation-
99.0 tons/year SO₂ emissions for P002, P003, P004, B004, B005, B006, B007, B008, and B009, combined, as a rolling, 365-day summation

Applicable Compliance Method-

Compliance shall be determined by use of the formula for gaseous fuels in OAC rule 3745-18-04(F)(3)

$$ER = (1 \times 10^6) / H \times D \times S \times 1.998$$

where: ER = the emission rate, in pounds of sulfur dioxide per mmBtu;
H = the heat content of the gaseous fuel, in Btu per standard cubic foot;
D = the density of the gaseous fuel, in pounds per standard cubic foot;
S = the decimal fraction of sulfur in the gaseous fuel, by weight.*

The daily SO₂ emissions are calculated using the following equation:

$$SO_2 = ER \text{ (lbs/mmBtu)} \times \text{Gas Consumption (cu.ft/day)} \times \text{(Btu/cu.ft)} / 2000 \text{ lbs/ton}$$

The rolling, 365-day summation is the sum of the daily SO₂ emission rates for the 365-day period. (The SO₂ emissions from the combustion of natural gas is assumed to be negligible in comparison to the emissions from the digester gas.)

*The Drager or Gastic tubes read in ppm, by volume. To convert to ppm by weight, multiply by the following ratio: density of H₂S/density of digester gas. The density of H₂S is equal to 0.08672 lb/ft³.

E. Testing Requirements (continued)

- 1.d** Emission Limitation-
83.0 tons/year NO_x for P002, P003, P004, B004, B005, B006, B007, B008, and B009 combined, as a rolling, 365-day summation

Applicable Compliance Method-

Compliance shall be determined by the calculation of the rolling 365-day emissions for all emissions units, as determined by the following methodology:

- i. multiply the cubic feet of digester gas burned (cubic feet/day) in emissions units P002, P003, and P004 by the heat value of digester gas as determined in C.1;
- ii. determine the NO_x emissions from P002, P003, and P004 by multiplying the product in (i) by the emission factor in AP-42 Chapter 13.5-1(9/91) of 0.068 lb NO_x/mmBtu.;
- iii. multiply the cubic feet of digester gas burned (cubic feet/day) in emissions units B004, B005, and B006 by the heat value of the digester gas as determined in C.1;
- iv. multiply the cubic feet of natural gas burned (cubic feet/day) in emissions units B004, B005, and B006 by the average heat value of natural gas (1000 Btu/cu.ft.);
- v. sum (iii) and (iv);
- vi. determine the NO_x emissions from B004, B005, and B006 by multiplying (v) by the emission factor in AP-42 Chapter 1.4-1(7/98) of 0.98 lb/mmBtu;
- vii. multiply the cubic feet of digester gas burned (cubic feet/day) in emissions units B007, B008, and B009 by the heat value of digester gas as determined in C.1;
- viii. multiply the cubic feet of natural gas burned (cubic feet/day) in emissions units B007, B008, and B009 by the average heat value of natural gas (1000 Btu/cu.ft.);
- ix. sum (vii) and (viii);
- x. determine the NO_x emissions from B007, B008, and B009 by multiplying (ix) by the emission factor in AP-42 Chapter 3.1-1(4/00) of 0.16 lb/mmBtu;
- xi. sum the results from (ii), (vi), and (x);
- xii. sum the results from (xi) for the 365-day period; and
- xiii. divide (xii) by 2000 lbs/ton.

E. Testing Requirements (continued)

- 1.e Emission Limitation-
99.0 tons/year CO for P002, P003, P004, B004, B005, B006, B007, B008, and B009, combined, as a rolling, 365-day summation

Applicable Compliance Method-

Compliance shall be determined by the calculation of the rolling 365-day emissions for all emissions units, as determined by the following methodology.

- i. multiply the cubic feet of digester gas burned (cubic feet/day) in emissions units P002, P003, and P004 by the heat value of digester gas as determined in C.1;
- ii. determine the CO emissions from P002, P003, and P004 by multiplying the product in (i) by the emission factor in AP-42 Chapter 13.5-1(9/91) of 0.37 lb CO/mmBtu.;
- iii. multiply the cubic feet of digester gas burned (cubic feet/day) in emissions units B004, B005, and B006 by the heat value of the digester gas as determined in C.1;
- iv. multiply the cubic feet of natural gas burned (cubic feet/day) in emissions units B004, B005, and B006 by the average heat value of natural gas (1000 Btu/cu.ft.);
- v. sum (iii) and (iv);
- vi. determine the CO emissions from B004, B005, and B006 by multiplying (v) by the emission factor in AP-42 Chapter 1.4-1(7/98) of 0.084 lb/mmBtu;
- vii. multiply the cubic feet of digester gas burned (cubic feet/day) in emissions units B007, B008, and B009 by the heat value of the digester gas as determined in C.1;
- viii. multiply the cubic feet of natural gas burned (cubic feet/day) in emissions units B007, B008, and B009 by the heat value of the natural gas (1000 Btu/cu.ft.);
- ix. sum (vii) and (viii);
- x. determine the CO emissions from B007, B008, and B009 by multiplying (ix) by the emission factor in AP-42 Chapter 3.1-1(4/00) of 0.017 lbmmBtu;
- xi. sum the results from (ii), (vi), and (x); and
- xii. sum the results from (xi) for the 365-day period; and
- xiii. divide (xii) by 2000 lbs/ton.

F. Miscellaneous Requirements

1. In accordance with OAC rule 3745-35-07, the following sections of this permit are federally enforceable: A - F