



State of Ohio Environmental Protection Agency

**RE: DRAFT PERMIT TO INSTALL CERTIFIED MAIL
MAHONING COUNTY**

Street Address:

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Lazarus Gov.
Center

Application No: 02-16880

DATE: 2/13/2003

Carbon Limestone LFG Power Station
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7700 San Felipe, Suite 480
Houston, TX 77063

You are hereby notified that the Ohio Environmental Protection Agency has made a draft action recommending that the Director issue a Permit to Install for the air contaminant source(s) [emissions unit(s)] shown on the enclosed draft permit. This draft action is not an authorization to begin construction or modification of your emissions unit(s). The purpose of this draft is to solicit public comments on the proposed installation. A public notice concerning the draft permit will appear in the Ohio EPA Weekly Review and the newspaper in the county where the facility will be located. Public comments will be accepted by the field office within 30 days of the date of publication in the newspaper. Any comments you have on the draft permit should be directed to the appropriate field office within the comment period. A copy of your comments should also be mailed to Robert Hodanbosi, Division of Air Pollution Control, Ohio EPA, P.O. Box 1049, Columbus, OH, 43266-0149.

A Permit to Install may be issued in proposed or final form based on the draft action, any written public comments received within 30 days of the public notice, or record of a public meeting if one is held. You will be notified in writing of a scheduled public meeting. Upon issuance of a final Permit to Install a fee of **\$3200** will be due. Please do not submit any payment now.

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. If you have any questions about this draft permit, please contact the field office where you submitted your application, or Mike Ahern, Field Operations & Permit Section at (614) 644-3631.

Very truly yours,

Michael W. Ahern, Supervisor
Field Operations and Permit Section
Division of Air Pollution Control

CC: USEPA

NEDO

Eastgate Dev. & Trans. Study

WV

PA

**STAFF DETERMINATION FOR THE APPLICATION TO CONSTRUCT
UNDER THE PREVENTION OF SIGNIFICANT DETERIORATION REGULATIONS
FOR CARBON LIMESTONE LFG POWER STATION
LOWELLVILLE, OHIO
PTI NUMBER 02-16880**

February 13, 2003

Ohio Environmental Protection Agency
Division of Air Pollution Control
Lazarus Government Center
122 South Front Street
Columbus, Ohio 43215

Staff determination for the application to construct under the federal prevention of significant deterioration regulations for the Energy Development Incorporated Carbon Limestone landfill gas power generation facility consisting of 16 internal combustion engines that will produce electricity by burning landfill gas to be located near Lowellville, Mahoning County, Ohio. The 16 internal combustion engines were permitted for PSD once already. During the stack testing the engines failed to meet the short term allowable. Therefore, another permit to install was applied to these 16 engines.

Executive Summary

The landfill gas (LFG) power station will be powered by 16 lean burn internal combustion (IC) engines manufactured by Deutz MWM, engine model TBG 620 V16 K. Emission from the IC engines will be estimated where possible using stack test generated factors, manufacturer's data, AP-42, and California Air Resources Board CATEF Database emission factors. For this LFG power station, the following 4 criteria pollutants are subject to Prevention of Significant Deterioration (PSD) review:

- a. Nitrogen oxide (NO_x) emissions from the 16 IC engines are 24.67 tons per year (tpy) per engine and 394.72 tpy total. The stack test determined emission rate of 1.893 g-NO_x/bkW-hr (1.361 g/bhp-hr) per engine is achieved by utilizing lean burn technology.
- b. Carbon monoxide (CO) emissions from the 16 IC engines are 36.3 tpy per engine and 580.3 tpy total. The stack test determined emission rate of 1.972 g-CO/bkW-hr (2.000 g/bhp-hr) per engine is achieved by utilizing lean burn technology.
- c. Volatile organic compounds (VOC) emissions from the 16 IC engines are 2.97 tpy per engine and 47.5 tpy total. The manufacturer's guaranteed emissions rate of 0.220 g-VOC/bkW-hr (0.164 g/bhp-hr) per engine is achieved by utilizing lean burn technology.
- d. Particulate matter less than 10 microns in diameter emissions (PM₁₀) from the 16 IC engines are 1.63 tpy per engine and 26.1 tpy total. The manufacturer's guaranteed emissions rate of 0.121 g-PM₁₀/bkW-hr (0.09 g/bhp-hr) per engine is achieved by utilizing gas pretreatment technology. The gas pretreatment system will utilize a condensate knockout tank to remove any free liquids and solids. The landfill gas then passes through 10 micron and 1 micron filters before being fed into the generator units. This treatment process reduces the possible impact of gaseous borne solids on the engine components and minimizes particulate emissions to the atmosphere.

1.0 Background and Rule Applicability

Energy Development Incorporated (EDI) proposes to locate the Carbon Limestone LFG Power Station at its existing Carbon Limestone Landfill near Lowellville, Mahoning County, Ohio. The EDI Carbon Limestone Landfill Gas Power Station (LFG Power Station) will consist of 16 internal combustion engines that will produce electricity by burning landfill gas.

1.1 New Source Review (NSR)/PSD Applicability

The proposed LFG Power Station is classified as a "major" stationary source because its potential NO_x and CO emissions, excluding fugitive emissions, exceed 250 tons per year in an attainment area. Mahoning County, Ohio, where these emissions units will be installed is an attainment area for all criteria pollutants. Per the PSD regulations, a PSD analysis is required for all pollutants which will be emitted at significant levels. Table 1.1 shows the emissions from the proposed modification.

Table 1.1, Net Emissions from the Proposed Installation

| Pollutant | Maximum Emissions of Pollutant Emission Sources (TPY) ¹ | Significant Level (TPY) | Significant Emissions Increase |
|------------------|--|-------------------------|--------------------------------|
| PM | 26.1 | 25 | yes |
| PM ₁₀ | 26.1 | 15 | yes |
| SO ₂ | 14.25 | 40 | no |
| NO _x | 394.7 (> 250) | 40 | yes |
| CO | 580.0 (> 250) | 100 | yes |
| VOC | 47.5 | 40 | yes |
| Pb (lead) | 0.0 | 0.6 | no |
| HAP | 2.75 | N/A | - |
| HAPs | 6.51 | N/A | - |

¹Based upon the above information, PSD review is required for PM₁₀ (all PM as PM₁₀), NO_x, CO, and VOC.

1.2 Other Rule Applicability

Sulfur dioxide (SO₂) from the 16 IC engines are 0.99 tpy per engine and 15.86 tpy total. Emissions of SO₂ were estimated using AP-42 emission factors from Supplement E section 2.4 Municipal Solid Waste Landfills. A fuel sulfur content of 46.9 ppm from Section 2.4.4.2 of AP-42 was used to develop an emission factor of 7.786 lb-SO₂/MMscf (0.049 g/bhp-hr). SO₂ emissions are less than the significance threshold and are not subject to BACT analysis.

Potential non-criteria pollutant (HAPs) emissions from the 16 IC engines are 0.38 tpy per engine and 6.15 tpy total. The HAPs emissions factors were based on emissions factors recommended by the California Air Resources Board CATEF Database.

The LFG Power Station is not directly subject to the New Source Performance Standard (NSPS) standard under 40 CFR Part 60, Subpart WWW- Municipal Solid Waste Landfills; however, since the IC engines are powered by LFG from a MSW Landfill, EDI will comply with the requirements of NSPS WWW. NSPS WWW sets forth non-methane organic compound (NMOC) standards for municipal solid waste landfills that commenced construction or modification on or after May 30, 1991. The LFG Power Station will serve as the landfill gas control device for the Carbon Limestone Landfill; therefore, it will comply with the landfill gas control requirements of NSPS WWW by reducing NMOC emissions by 98% or to less than 20 parts per million by volume, dry basis as hexane at 3% oxygen. The LFG Power Station will also comply with the testing, monitoring and recordkeeping requirements of NSPS WWW.

2.0 Best Available Control Technology Review

The proposed LFG Power Station is subject to PSD regulations which mandate that a case-by case

Best Available Control Technology (BACT) analysis be performed for pollutants regulated under the CAA that are emitted in significant quantities: PM₁₀, NO_x, CO, and VOC.

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2.1 General BACT Methodology

OAC Rule 3745-31-15 requires that a BACT analysis be performed for newly constructed major sources or major modifications to existing major sources of air pollutants subject to review under PSD regulations. Individual BACT determinations are performed for each pollutant subject to a PSD review emitted from an emission unit. BACT is defined in OAC rule 3745-31-01(M) as follows:

an emissions limitation (including a visible emissions standard) based upon the maximum degree of reduction for each air pollutant subject to regulation under the Clean Air Act that would be emitted from any proposed major stationary source or major modification that the director, on a case-by-case basis, taking into account energy, environmental and economic impacts and other costs, determines is achievable for such major stationary source or major modification through application of production processes or available methods, systems and techniques, including fuel combustion techniques for control of such air pollutant.

The structure of the BACT analysis reflects the "top-down" BACT guidance (USEPA 1990a) required by U.S. EPA and DAPC for PSD determinations:

1. Identify all "available" control options.
2. Evaluate each control option with respect to source-specific factors.
3. List remaining control options in order of over-all control effectiveness for the pollutant under review, with the most effective control alternative at the top.
4. After the identification of available and technically feasible control technology options, the energy, environmental, and economic impacts are considered to arrive at the final level of control.

The BACT analysis focuses on the direct impact of the control alternative. The analysis must also consider whether impacts of unregulated air pollutants or non-air impacts such as liquid, solid, or hazardous waste disposal impacts would justify selection of an alternative control option. If there are no outstanding issues regarding collateral environmental impacts, the analysis is ended and the results proposed as BACT. BACT analysis utilizes dollars per ton of pollutant controlled as the applicable measure of cost effectiveness. This ratio is applied on an incremental basis, to compare the cost effectiveness of each control option to the baseline case (i.e., base emissions case for the IC engines will be an IC engine equipped with lean burn control technology).

2.2 Cost Effectiveness

The economic impact incurred by the use of each control alternative is measured by that alternative's cost effectiveness. Cost effectiveness is the value obtained (in dollars per ton of pollutant removed) by dividing the total annualized cost by the annual tons of pollutant controlled. Cost effectiveness values provide a means to compare the economic feasibility of various control alternatives.

2.3 Summary of BACT Methodology

Sections 3, 4, 5, and 6 provide BACT analyses for NO_x, CO, VOCs, and PM₁₀ (PM), respectively. In each section, a review of previous BACT determinations for the sources and pollutants is provided, and alternative control technologies available for each source and for each pollutant emitted from each source in significant quantities are described. The analyses follow the USEPA "top down" format for evaluating and selecting BACT controls.

The technical feasibility of controls is discussed individually by pollutant and type of source subject to BACT. Control technologies that have the potential to be applied to a source and pollutant are listed, and a brief identification of technical issues regarding each control alternative is provided. Finally, available remaining controls are ranked by control effectiveness, and economic, environmental, and energy impacts assessed for each control in a top-down fashion until BACT is selected.

3.0 BACT Analysis for NO_x

This section describes the BACT assessment for the control of NO_x emissions from the 16 IC engines associated with the proposed LFG power station project. The NO_x emissions will exceed the PSD significant threshold of 40 tpy.

3.1 NO_x RACT/BACT/LAER Clearinghouse Review

A review of the RACT/BACT/LAER (RBLCL) Clearinghouse (USEPA 2000) on the U.S. EPA TTN computer bulletin board system was performed to identify previous BACT determinations for IC engines using landfill gas as a fuel. As shown in Table 3.1, emission limits range from 0.59 to 2.4 g/hp-hr. The most stringent limit is 0.59 g/hp-hr, with the control technology being lean burn combustion for a source located in California.

Table 3.1, U.S. EPA RACT/BACT/LAER CLEARINGHOUSE - NO_x FOR LFG-FIRED IC ENGINES

| RBLCL ID | FACILITY | STATE | PERMIT DATE | CAPACITY | EMISSION LIMIT | CONTROL TECHNOLOGY | BASIS |
|-----------------|---|--------------|--------------------|---|-----------------------|-------------------------------------|-----------------|
| AZ-0027 | Minnesota Methane | AZ | 11/12/95 | 4 - IC Engines; 800 kW ea LFG-Fired | 99 tpy; ~ 2.4 g/hp-hr | Air/Fuel controller | BACT |
| CA-0525 | Pacific Energy, Otay Mesa Landfill | CA | 02/25/92 | IC Engine; 2,650 hp LFG-fired | 0.8 g/hp-hr | Pre-Chamber Combustion & AFR | California BACT |
| CA-0692 | City of Tulare, WWTP digester gas | CA | 03/13/96 | IC Engine; 8.77 MMBtu/hr (digester gas) | 1.0 g/hp-hr | Lean Burn and Pre-Stratified Charge | California BACT |
| CA-0789 | Monterey Regional Waste Management District | CA | 11/04/96 | IC Engine; 1,274 hp LFG-fired | 1.2 g/hp-hr | Lean Burn Combustion | LAER |
| CA-0843 | Minnesota Methane Tajiwas Corporation | CA | 01/09/98 | IC Engine; Unknown LFG-fired | 0.59 g/hp-hr | Lean Burn Combustion | California BACT |
| NJ-0021 | MN Hackensack Energy, LLC | NJ | 04/09/98 | 4 - IC Engines; 3.8 MW Total, LFG-fired | 1.0 g/hp-hr | Reciprocating IC Engine | LAER |
| RI-0005 | Northeast Landfill Power | RI | 12/12/89 | IC Engine; 2,400 hp LFG-fired | 1.25 g/hp-hr | Lean Burn Combustion | BACT-PSD |

3.2 Recent Ohio EPA BACT Determinations

The Ohio EPA recently issued four Permits to Install for LFG power. Two of these were issued in December 1998, and two were issued near the end of 1999. Table 3.2 summarizes the recent permit.

TABLE 3.2, RECENT OHIO EPA BACT DETERMINATIONS

| FACILITY | SOURCE | PTI NO. | BAT DETERMINATION |
|---|-----------------------------------|--------------|---|
| Bio-Gas Technologies Inc. Port Clinton, Ohio | (3) Landfill gas-fired IC engines | 03-306 0 | Compliance with permit terms and conditions. Emission limits based on lean burn control technology. |
| Bio-Gas Technologies Inc. Milan, Ohio | (2) Landfill gas-fired IC engines | 03-305 9 | Compliance with permit terms and conditions. Emission limits based on lean burn control technology. |
| EDI - CLD Landfill Power Station Salem, Ohio | (3) Landfill gas-fired IC engines | 02-135 33 | Compliance with permit terms and conditions. Emission limits based on lean burn control technology. |
| EDI - Model Landfill Power Station Jackson Township (Columbus), Ohio | (4) Landfill gas-fired IC engines | 01-806 0 | Compliance with permit terms and conditions. Emission limits based on lean burn control technology. |

3.3 Availability of NO_x Control Technologies

Available NO_x control techniques for the IC engines proposed at the Carbon Limestone Power Station are summarized in Table 3.3. These techniques can be classified as either combustion control methods (including low emission equipment, processes or fuels) aimed at reducing the formation of NO_x in the combustion process or flue gas controls which reduce the NO_x present in the exhaust gases to elemental nitrogen.

TABLE 3.3, Identified Air Pollution Control Technology- NO_x

| SOURCE | COMBUSTION CONTROLS | EXHAUST TREATMENTS |
|---------------------|--|---|
| Gas-Fired IC Engine | Air/Fuel Ratio Control Pre-Stratified Charge Combustion Lean Burn Low Nitrogen Fuel | Selective Catalytic Reduction Non-selective Catalytic Reduction Selective Non-Catalytic Reduction |

3.4 General Description of NO_x Combustion Controls

Combustion controls for IC engines include air-fuel ratio (AFR) control, pre-stratified charge (PSC), and clean-burn modifications (lean burn). Each seeks to minimize the formation of NO_x and consist of either modifications of combustion operating conditions or modifications of combustion equipment. All of these combustion control techniques are aimed at achieving one or more of the following goals: 1) reducing the available oxygen at critical stages of combustion; 2) lowering the peak flame temperature; and 3) reducing the residence time at the temperatures at which oxidation of nitrogen takes place to form NO_x. Included in this general control category is operating in accordance with manufacturer's recommendations and practicing good operation and maintenance procedures. These techniques assure optimum combustion and therefore minimize all pollutant byproducts of the combustion process, including NO_x. Each of these combustion control options is described briefly below.

Air-Fuel Ratio Control: In an IC reciprocating engine, an air-fuel ratio controller monitors the oxygen content in the exhaust and provides feedback control to the fuel gas such that the combustion zone can be consistently maintained in an operating region which minimizes the formation of oxides of nitrogen.

Pre-Stratified Charge (PSC): The concept of PSC is to introduce controlled amounts of air into the intake manifold in a specified sequence and quantity to create fuel-rich and fuel-lean combustion zones. The fuel-rich zone is adjacent to the igniter to insure stable operation of the engine. The fuel lean zone rapidly quenches the flame reducing the NO_x formation rate.

Lean Burn: In a lean burn engine, a large volume of air is introduced into the chamber to lower the flame temperature and reduce NO_x formation rates. To maintain stable engine operation at extremely lean main chamber conditions, a fuel rich mixture is introduced into a small prechamber containing an igniter plug. Once ignited, the flame passes from the prechamber into the main cylinder to provide an effective ignition source for the extremely lean fuel air mixture.

3.5 General Description of NO_x Flue Gas Treatment Controls

Flue gas controls: selective non-catalytic reduction (SNCR), non-selective catalytic reduction (NSCR), and selective catalytic reduction (SCR), are designed to reduce the NO_x which has already been formed to molecular nitrogen. SCR and SNCR processes inject a reducing agent into the flue gas of a combustion unit which reduces NO to molecular nitrogen. Reducing agents are injected into the flue gas either in the presence or absence of a catalyst. NSCR utilizes reducing compounds in the flue gas to convert NO to molecular nitrogen. Each of these flue gas treatment control options is described below:

Selective Non-catalytic Reduction: The non-catalytic process, SNCR, involves the non-catalytic decomposition of NO_x in the flue gas to nitrogen and water using either urea or ammonia as a reducing agent. The ammonia process (trade name Thermal DeNO_x®) is based on a gas phase homogeneous reaction between NH₃ and NO_x within a specific temperature range (1,600 to 2,200°F). Ammonia must be injected into the flue gas by means of a carrier gas (air or steam) at a location in the unit that provides optimum reaction temperature and residence time. While the conversion occurs optimally between 1,700 and 1,850°F, the temperature window can be lowered to 1,300°F through the additional injection of hydrogen.

In the urea process (trade name NO_xOUT®), urea is injected into the flue gas at a location in the unit that provides optimum reaction temperature and residence time. The optimum gas temperature is between about 1,600 and 2,100°F depending on residence time. Greater quantities of urea can be injected to improve NO_x reduction and to speed the reaction kinetics. This can result in some NH₃ slippage and a slight increase in CO since both are generated as byproducts from the incomplete thermal decomposition of the excess urea.

Achieving the required reaction temperature represents the main design problem for each application of SNCR. The necessary temperature window is found in different areas of the combustion source, depending on its design and operating load. Various options, including multiple injection ports and computer modeling techniques are being utilized to facilitate achieving the necessary temperatures under varying load conditions.

Non-selective Catalytic Reduction: Non-selective catalytic reduction (NSCR) technology is

applicable to certain internal combustion engines (rich-burn, gas-fired) that are operated at all times with an AFR at or close to stoichiometric. Under these conditions, NSCR can, over a single catalyst bed usually downstream of the silencer, simultaneously reduce NO_x and oxidize CO and hydrocarbons in the combustion gas to N_2 , CO_2 , and water. The catalyst, usually a noble metal (platinum, rhodium, or palladium), causes the reducing gases in the flue gas H_2 , hydrocarbons (primarily CH_4), and CO to react

with NO_x to reduce both NO and NO_2 to elemental nitrogen at a temperature between 800 and 1200°F for peak reduction performance of 80 to 90 percent.

The NSCR process requires fuel-rich engine operation or the addition of reducing agents in the flue gas upstream of the catalyst. The engine generally has to be operated with an AFR at or below stoichiometric in order to provide for an adequate concentration of reducing agents in the exhaust gas. Under this condition, and in the presence of a catalyst, the oxides of nitrogen are reduced by the CO and hydrocarbons, reducing the presence of all three pollutants in the flue gas. NSCR works most efficiently in constant load situations because of the narrow AFR window in which the system is effective, and the limits of current AFR technology in maintaining the correct AFR in varying load conditions.

Selective Catalytic Reduction: SCR is another post-combustion gas treatment technique for reduction of NO and NO_2 in the exhaust stream to molecular nitrogen, water, and oxygen. Ammonia (NH_3) is used as the reducing agent. The catalyst's active surface is usually either a noble metal or base metal (titanium or vanadium oxide, or a zeolite-based material). Metal-based catalysts are usually applied as a coating over a metal or ceramic substrate. Zeolite catalysts are typically a homogeneous material that forms both the active surface and the substrate. The most common catalyst body configuration is a monolithic, "honeycomb" design. An ammonia injection grid is located upstream of the catalyst body and is designed to disperse the ammonia uniformly throughout the exhaust flow before it enters the catalyst unit. In a typical ammonia injection system, anhydrous ammonia is drawn from a storage tank and evaporated using a steam or electric-heated vaporizer. The vapor is mixed with a pressurized carrier gas to provide both sufficient momentum through the injection nozzles and effective mixing of the ammonia with the exhaust gases. The carrier gas is usually compressed air or steam.

An alternative to using the anhydrous ammonia system is to inject an aqueous ammonia solution. This system is currently not as common but minimizes the potential safety hazards associated with transporting and storing anhydrous ammonia. SCR systems generally operate with a molar NH_3/NO_x ratio greater than stoichiometric to achieve optimal conversion efficiencies, resulting in the passage of unreacted ammonia to the atmosphere. This unreacted ammonia is known as ammonia slip.

3.6 Available LFG-Fired IC Engine NO_x Controls

NO_x control technologies available for use on LFG-fired IC engines include air-fuel ratio (AFR) control, pre-stratified charge (PSC), and clean-burn modifications (lean burn). All of the flue gas treatment controls (SCR, SNCR, and NSCR) are technically infeasible for reasons presented below. All of the combustion control technologies are incorporated into the proposed baseline option of lean burn control technology, and therefore will not be evaluated or discussed further other than lean burn low NO_x technology.

3.7 Technical Infeasibility of Flue Gas Treatment Control Systems

SCR and NSCR technologies are capable of reducing NO_x emissions by up to 90 percent below typical uncontrolled baseline levels. However, two EPA published documents were found which confirm that the presence of siloxanes in LFG and digester gas clog catalysts, shortening their life, and rendering them inoperable.

The first document was a memorandum from Sims Roy of the U.S. EPA's Emission Standards Division Combustion Group, in which the subject was HAP emission control technologies for new stationary combustion turbines (USEPA 1999b). In this memorandum, Sims Roy indicates:

Oxidation catalyst systems can be used on combustion turbines which combust all types of gaseous and liquid fuels except for LFG and digester gases, which foul the catalyst very quickly because of a compound called siloxane contained in these fuels. Siloxanes are difficult and very costly to remove from these fuels. Therefore, the application of oxidation catalyst systems to combustion turbines that burn LFG or digester gas does not appear to be feasible. Also there are no known installations or oxidation catalysts on combustion turbines burning LFG or digester gases.

The second document is a Draft White Paper that was written in order to summarize the findings and/or make recommendations on the reciprocating internal combustion engine (RICE) Workgroup's database of engines burning either digester or LFG. One of the technologies evaluated in the study was catalytic controls (NSCR or oxidation). Following are brief summaries of the case studies on catalytic controls contained in the White Paper (USEPA 1998b):

- Testing conducted in 1996 indicates the engines catalyst's performance dropped to 80% efficiency after only 250 hours of operation and the catalyst became completely de-activated after only 700 hours of operation. The problem identified in the report was catalyst clogging due to Siloxane.
- The Los Angeles County Sanitation District (LACSD) prepared a memorandum summarizing catalyst manufacturers rejection to bid on supplying an SCR system for a turbine firing digester gas.
- A San Diego POTW installed and operated a pretreatment system (prior to their SCR system for NO_x control on their engine) which consisted of water drop out, physical screening and activated carbon, to remove the Siloxane prior to combustion in the engine. The pre-treatment system worked; however, capital and operating costs were so high that the facility has replaced the pre-treatment system with a low- NO_x clean burn engine.

In summary, the RICE Workgroup stated that it does not consider catalytic control an above the floor MACT option for LFG or digester gas. They based this conclusion on the fact that there are no catalyst controlled LFG or digester gas engines successfully operating in the United States. In addition, NSCR is effective on rich-burn (< 2% O₂ in exhaust), gas-fired applications only (the proposed IC engines for the power station are of lean burn design > 7% O₂ in exhaust).

3.8 Summary of NO_x Control Research

While flue gas treatment control systems are very effective at controlling NO_x emissions from IC engines burning natural gas, they are clearly technically infeasible as an application on LFG fired IC engines. Therefore, SCR, SNCR, and NSCR are rejected as BACT for LFG-fired IC engine NO_x emissions control, and will not be evaluated further.

3.9 Top-Down Evaluation of LFG-Fired IC Engine NO_x Controls

As mentioned previously, since lean burn (low NO_x) technology is available for these IC engines when fired on LFG, it is the baseline level of control for this BACT analysis. Lean burn control design is a common BACT control for IC engines.

3.9.1 Lean Burn Air/Fuel Ratio Control

The lean burn engine employs a precombustion chamber on each cylinder which serves to reduce NO_x formation through combustion of a lean air-fuel mixture and reduced combustion time. The reduction in NO_x emissions achieved with this design is based on the mechanics of NO_x formation. The rate of formation of thermal NO_x is a function of residence time, free oxygen, and peak flame

temperatures. Therefore, most control techniques, including the lean burn engine design, are aimed at minimizing one or more of these variables.

The pre-combustion chamber in the lean burn engine specifically targets peak flame temperature by inducing main combustion in a fuel-lean environment. A small supply of fuel and less air than stoichiometrically required (fuel-rich mixture) are introduced into the pre-combustion chamber and ignited with a conventional spark plug. The resulting "torch" then issues through an orifice into the main combustion chamber, firing the primary fuel/air charge. Since the primary combustion mixture is fuel-lean, the large excess of air present acts as a thermal sink, so much so that combustion would not be sustained in a conventional engine. The torch issuing from the pre-combustion chamber, however, is of sufficient intensity and duration to insure sustained combustion at a lower temperature than a conventional engine. This lower temperature, in turn, results in suppression of thermally generated NO_x.

3.9.2 Environmental Impacts

The Deutz TBG 620K V16 lean burn low NO_x IC engines have maximum NO_x emission rates of 0.6 g/hp-hr (0.804 g/bkW-hr) or 10.9 tpy per engine, when fired on LFG. This results in an overall NO_x emission rate of 173.9 tpy total for all 16 engines. The projected emission rates for these IC engines configured with the lean burn design represent a total reduction in the NO_x emissions of 235.6 tpy (14.7 tpy per engine) from the standard (1.4 g/hp-hr, 25.6 tpy per engine) Deutz TA Luft combustion configuration (approximately 57 percent reduction for each of the engines).

There are no known negative environmental factors associated with the lean burn combustion technology. The proposed IC engines have minimal VOC, SO₂, and PM₁₀ emissions and there are no solid and liquid waste streams to handle. The only drawback for this engine configuration, is an increase in the CO emission rate from 26.7 tpy per engine to 36.2 tpy per engine.

3.9.3 Economic Impacts

There is no immediate economic impact from the lean burn combustion configuration since it is offered as part of the IC engines' package at minimal extra cost. However, there is an increased economic burden in higher fuel consumption since the increased AFR means the engine must process more mass for the same power and therefore is less efficient. In addition, there will be increased maintenance costs.

3.9.4 Energy Impacts

The only energy impacts associated with the lean burn combustion technology will be the less efficient operation of the units which leads to increased fuel consumption.

3.10 Summary

Lean burn engine design is typically required as BACT. This type of engine has become the standard engine of choice for large capacity, gas compressor stations. The lean burn engine provides for substantial reductions in NO_x emissions compared to the standard TA Luft design level. Increases in CO or HC emissions would not be significant, and there are no liquid or solid waste streams which require disposal. Similarly, there are no known significant negative energy impacts associated with their use. These factors make lean burn combustion controls the NO_x control technology of choice for these engines. This approach meets the criteria for approval as BACT.

3.11 Conclusion: NO_x BACT

A BACT evaluation has been performed for NO_x emissions associated with the 16 Deutz TBG 620K V16 lean burn low NO_x IC engines for the proposed power station. Application of Deutz's lean burn

combustion control to a level of 0.6 g/hp-hr for NO_x has been determined to constitute BACT.

Several other flue gas treatment NO_x reduction technologies were also evaluated, including SCR, SNCR, and NSCR. These technologies were rejected as BACT as they are technically infeasible when applied to lean burn LFG-fired IC engines for the following reasons:

- SCR- The presence of siloxane in the LFG causes a shortening of the usable life of the catalyst, and there are no catalyst controlled LFG engines successfully operating in the United States.
- SNCR-Requires exhaust temperatures above 1,300°F (lean burn IC engines operate at 820 - 870°F) and requires a residence time longer than feasible in an IC engine source. It may be feasible to utilize this technology in the future; however, this technology has not been applied to IC engines to date.
- NSCR- Siloxane in the LFG renders the catalyst inoperable and NSCR requires a low excess oxygen content in the flue gas exhaust to be effective. This technology is technically infeasible on a lean burn IC engine which operates at about 7 - 8 % O₂ in the flue gas exhaust. NSCR is effective on rich-burn (< 2% O₂ in the exhaust), natural gas-fired applications only.

BACT was selected as 0.6 g/bhp-hr (0.804 g/bkw-hr, 2.48 lb/hr, 10.9 tpy) per engine, by utilization of lean burn engines. This value can be achieved at a reasonable cost effectiveness with no adverse environmental or energy impacts.

4.0 BACT Analysis for CO

This section describes the BACT assessment for the control of CO emissions from the 16 IC engines associated with the proposed LFG power station project. The CO emissions will exceed the PSD significant threshold of 100 tpy.

4.1 CO RACT/BACT/LAER Clearinghouse Review

A review of the RBLC database (USEPA 2000) on the U.S. EPA TTN computer bulletin board system was performed to identify previous CO BACT determinations for IC engines using landfill gas as a fuel. As shown in Table 4.1, four determinations included emission limits. Of these four determinations, emission limits range from 1.125 to 2.4 g/hp-hr, with control technology most commonly being lean burn combustion. The most stringent limit is 1.125 g/hp-hr. As indicated in Table 3.1 of the NO_x RBLC database search results, the NO_x BACT limit for this source (RBLC ID RI-0005) is 1.25 g/hp-hr, which is appropriate for this engine as it appears to be tuned for operating in a balanced mode (i.e., similar NO_x and CO emission rates). If this engine was tuned to operate more lean in order to further reduce NO_x emissions, the CO value would be somewhere around 2.0 to 2.5 g/hp-hr. This is further supported by RBLC ID NJ-0022 which has a LAER CO limit of 2.3 g/hp-hr and a NO_x LAER limit of 1.0 g/hp-hr, indicating the focus of the emissions control was to lower NO_x which results in an increased CO emission rate.

TABLE 4.1, U.S. EPA RACT/BACT/LAER CLEARINGHOUSE - CO FOR LFG-FIRED IC ENGINES

| RBL C ID | FACILITY | STATE | PERMIT DATE | CAPACITY | EMISSION LIMIT | CONTROL TECHNOLOGY | BASIS |
|----------|------------------------------------|-------|-------------|---|------------------------------|---------------------------|-----------|
| AZ-0027 | Minnesota Methane | AZ | 11/12/95 | 4 - IC Engines; 800 kW ea LFG-Fired | 99.9 tpy; ~ 2.4 g/hp-hr | Air/Fuel controller | BACT |
| NJ-0021 | MN Hackensack Energy, LLC | NJ | 04/09/98 | 4 - IC Engines; 3.8 MW Total, LFG-fired | 0.607 lb/MMBtu ~ 2.1 g/hp-hr | Reciprocating IC Engine | NSPS |
| NJ-0022 | Manchester Renewable PWR Corp. LFG | NJ | 05/10/95 | 6 - IC Engines; 800 kW ea LFG-fired | 2.3 g/hp-hr | No control method listed. | LAER |
| RI-0005 | Northeast Landfill Power | RI | 12/12/89 | IC Engine; 2,400 hp LFG-fired | 1.125 g/hp-hr | Lean Burn Combustion | BACT-PS D |

4.2 Availability of CO Control Technologies

CO, unlike some other major gaseous pollutants, does not lend itself to exhaust gas removal techniques. While selective catalytic oxidation is available to control CO after it is formed, a more productive approach is the control of its formation in the first place. It is important to note that many NO_x combustion control techniques that attempt to control the formation of NO_x in the combustion process by limiting combustion temperature and residence time will unfortunately tend to increase the formation of CO which results in a higher rate of incomplete combustion of carbon monoxide. However, because of the relative innocuous nature of CO, most regulatory agencies require more emphasis on the control of NO_x than on CO because NO_x levels play an important role in the formation of ozone, a more pervasive ambient air quality problem in the U.S. Available CO controls are described below and summarized in Table 4.2.

TABLE 4.2, IDENTIFIED AIR POLLUTION CONTROL TECHNOLOGY - CO

| SOURCE | COMBUSTION CONTROLS | EXHAUST TREATMENTS |
|---------------------|--|--|
| Gas-Fired IC Engine | Operate Per Design Avoid NO _x Controls | Selective Catalytic Oxidation Non-selective Catalytic Reduction |

4.3 Available LFG-Fired IC Engine CO Controls

Available CO control techniques for IC engines include Selective Catalytic Oxidation, Non-Selective Catalytic Reduction, and combustion tuning and operation per the manufacturer's recommendations. NO_x control techniques such as clean burn and lean burn technologies which reduce NO_x emissions by lowering the peak flame temperature will generally increase CO emissions. Since lean burn NO_x emissions control is proposed, CO emissions will typically increase based on the manufacturer's recommended operation. Flue gas treatment control technology (NSCR and SCO) is effective on lean-burn, gas-fired or diesel-fired applications, but as demonstrated in the NO_x BACT analysis, they are clearly technically infeasible as an application on LFG-fired IC engines. Therefore, NSCR and SCO are rejected as BACT for LFG-fired IC engine CO emissions control, and will not be evaluated further. Proper operation and proper engine tuning is the only control considered feasible.

4.4 Top-Down Evaluation of LFG-Fired IC Engine CO Controls

The only CO control technology considered technically feasible for the 16 IC engines is proper combustion control. The engine manufacturer has attempted to minimize CO emissions formation while at the same time limiting the formation of NO_x emissions through the use of lean burn combustion technology. CO emissions can be maintained at these relatively low levels by the proper operation and maintenance of the IC engines with no additional cost or energy impacts. Therefore, BACT is determined to be operation and maintenance of each IC engine according to the manufacturer's recommendations. The BACT emission limits proposed represent the manufacturer's guaranteed values with the use of lean burn NO_x combustion technology.

4.5 Summary and Conclusion: CO BACT Analysis

Two control technologies were evaluated: flue gas treatment control technology (NSCR and SCO) and proper operation and maintenance of the IC engines according to the manufacturer's recommendations. Flue gas treatment control was rejected as BACT because siloxane in the LFG renders the catalyst inoperable, and NSCR requires a low excess oxygen content in the flue gas exhaust to be effective, since the oxygen must be depleted before the reduction chemistry can progress. This technology is technically infeasible on a lean burn IC engine which operates at about 7 - 8 % O₂ in the flue gas exhaust. NSCR is effective on rich-burn (<2% O₂ in the exhaust), natural gas-fired applications only.

In summary, BACT was selected as 2.0 g/bhp-hr (2.681 g/bkw-hr, 8.28 lb/hr, 36.3 tpy) per engine, by proper operation and maintenance of each IC engine according to the manufacturer's recommendations. This value can be achieved at a reasonable cost effectiveness with no adverse environmental or energy impacts. These values are in line with previous BACT determinations found in the search of the RBLC data base.

5.0 BEST AVAILABLE CONTROL TECHNOLOGY ANALYSIS FOR VOC

This section describes the BACT assessment for the control of VOC emissions from the 16 IC engines associated with the proposed LFG power station project. The VOC emissions will exceed the PSD significant threshold of 40 tpy.

5.1 VOC RACT/BACT/LAER Clearinghouse Review

A review of the RBLC database (USEPA 2000) on the U.S. EPA TTN computer bulletin board system was performed to identify previous VOC BACT determinations for IC engines using landfill gas as a fuel. As shown in Table 5.1, five determinations included emission limits. Of these five determinations, emission limits range from 0.25 to 0.5 g/hp-hr, with control technology most commonly being lean burn combustion. The most stringent limit is 0.25 g/hp-hr. As indicated in Table 3.1 of the NO_x RBLC database search results, the NO_x BACT limit for these sources is 1.0 g/hp-hr, which is appropriate for these engines as they are meeting LAER NO_x requirements by use of lean burn control technology.

Table 5.1, U.S. EPA RACT/BACT/LAER CLEARINGHOUSE - VOC FOR LFG-FIRED IC ENGINES

| RBLC ID | FACILITY | STA TE | PERMI T DATE |
|--------------------|-----------------|-------------------|-----------------------------|
|--------------------|-----------------|-------------------|-----------------------------|

| | | | | CAPACITY | EMISSION LIMIT | CONTROL TECHNOLOGY | BASIS |
|-------------|-----------------------------------|----|----------|---|--------------------------------|---|--------------|
| CA-06 92 | City of Tulare, WWTP digester gas | CA | 03/13/96 | IC Engine; 8.77 MMBtu/hr (digester gas) | 0.25 g/hp-hr | Gaseous Fuel & Pos. Crankcase Ventilation | CA BACT |
| CA-08 43 | Minnesota Methane Tajiuas Corp. | CA | 01/09/98 | IC Engine; Unknown LFG-fired | 20 ppmvd @ 3% O ₂ | Lean Burn w/AFR | CA BACT |
| NJ-00 21 | MN Hackensack Energy, LLC | NJ | 04/09/98 | 4 - IC Engines; 3.8 MW Total, LFG-fired | 0.074 lb/MMBtu 0.25 g/hp-hr | Reciprocating IC Engine | NSPS |
| NJ-00 22 | Manchester Renewable PWR Corp | NJ | 05/10/95 | 6 - IC Engines; 800 kW ea LFG-fired | 0.375 g/hp-hr | No control method listed. | LAER |
| RI-000 5 | Northeast Landfill Power | RI | 12/12/89 | IC Engine; 2,400 hp LFG-fired | 0.5 g/hp-hr | Lean Burn Combustion | BACT-PSD |

Table 5.2, IDENTIFIED AIR POLLUTION CONTROL TECHNOLOGY - VOC

| SOURCE | COMBUSTION CONTROLS | EXHAUST TREATMENTS |
|---------------------|----------------------------|--|
| Gas-Fired IC Engine | Operate Per Design | Selective Catalytic Oxidation Non-selective Catalytic Reduction |

5.2 Available LFG-Fired IC Engine VOC Controls

The only VOC control available for the LFG-fired IC engines is combustion tuning and operation per the manufacturer's recommendations. NO_x control techniques such as clean burn and lean burn technologies which reduce NO_x emissions by lowering the peak flame temperature will generally increase VOC emissions. Since lean burn NO_x emissions control is proposed, VOC emissions will typically increase based on the manufacturer's recommended operation. Flue gas treatment control technology (NSCR and SCO) is effective on lean-burn, gas-fired or diesel-fired applications, but as demonstrated in the NO_x BACT analysis, they are clearly technically infeasible as an application on LFG-fired IC engines. Therefore, NSCR and SCO are rejected as BACT for LFG-fired IC engine VOC emissions control, and will not be evaluated further. Proper operation and proper engine tuning is the only control considered feasible.

5.3 Top-Down Evaluation of LFG-Fired IC Engine VOC Controls

The only VOC control technology considered technically feasible for the 16 IC engines is proper combustion control. The engine manufacturer has attempted to minimize VOC emissions formation while at the same time limiting the formation of NO_x emissions through the use of lean burn combustion technology. VOC emissions can be maintained at these relatively low levels by the proper operation and maintenance of the IC engines with no additional cost or energy impacts. Therefore, BACT is determined to be operation and maintenance of each IC engine according to the manufacturer's recommendations. The BACT emission limits proposed represent the manufacturer's guaranteed values with the use of lean burn NO_x combustion technology.

5.4 Summary and Conclusion: VOC BACT Analysis

Two control technologies were evaluated: flue gas treatment control technology (NSCR and SCO) and proper operation and maintenance of the IC engines according to the manufacturer's recommendations. Flue gas treatment control was rejected as BACT because siloxane in the LFG renders the catalyst inoperable, and NSCR requires a low excess oxygen content in the flue gas

exhaust to be effective, since the oxygen must be depleted before the reduction chemistry can progress. This technology is technically infeasible on a lean burn IC engine which operates at about 7 - 8 % O₂ in the flue gas exhaust. NSCR is effective on rich-burn (< 2% O₂ in the exhaust), natural gas-fired applications only.

BACT was determined to be 0.164 g/bhp-hr (0.220 g/bkw-hr, 0.68 lb/hr, 2.97 tpy) per engine, by proper operation and maintenance of each IC engine according to the manufacturer's recommendations. This value can be achieved at a reasonable cost effectiveness with no adverse environmental or energy impacts. These values are in line with previous BACT determinations found in the search of the RBLC data base.

The proposed LFG Power Station will comply with those specific sections of NSPS Subpart WWW of 40 CFR 60- Standards of Performance for Municipal Solid Waste Landfills by reducing NMOC emissions by either 98 weight percent or to less than 20 parts per million by volume, dry basis (ppmvd) as hexane at 3 percent oxygen. EDI will also comply with the testing, monitoring, and record keeping requirements applicable to control systems under NSPS WWW.

6.0 BACT Analysis for PM₁₀

This section describes the BACT assessment for the control of PM₁₀ emissions from the IC engines associated with the proposed LFG power station project. The PM₁₀ emissions will exceed the PSD significant threshold of 15 tpy.

6.1 PM₁₀ RACT/BACT/LAER Clearinghouse Review

A review of the RBLC database (USEPA 2000) on the U.S. EPA TTN computer bulletin board system was performed to identify previous PM₁₀ BACT determinations for IC engines using landfill gas as a fuel. As shown in Table 6.1, two determinations included emission limits. The most stringent control listed is 0.06 g/bhp-hr.

Table 6.1, U.S. EPA RACT/BACT/LAER CLEARINGHOUSE - PM₁₀ FOR LFG-FIRED IC ENGINES

| RBLC ID | FACILITY | STATE | PERMIT DATE | CAPACITY | EMISSION LIMIT | CONTROL TECHNOLOGY | BASIS |
|----------------|---------------------------------------|--------------|--------------------|---|---------------------------------|--|--------------|
| CA-06 92 | City of Tulare, WWTP digester gas | CA | 03/13/96 | IC Engine; 8.77 MMBtu/hr (digester gas) | 7.52 lb/MMscf ~ 0.06 g/hp-hr | Gaseous Fuel & Pos. Crankcase Ventilation | CA BACT |
| CA-08 43 | Minnesota Methane Tajiuas Corporation | CA | 01/09/98 | IC Engine; Unknown LFG-fired | 76.5 lb/day 3.19 lb/hr | pre-treatment to remove condensate and filter PM | CA BACT |

6.2 Availability of PM₁₀ Control Technologies

PM₁₀ control technologies available for use on IC engines, summarized in Table 6.2, can be classified as either combustion controls or flue gas controls which remove PM₁₀ from the gas stream.

TABLE 6.2, Identified Air Pollution Control Technology- PM₁₀

| SOURCE | COMBUSTION CONTROLS | EXHAUST TREATMENTS |
|---------------------|---|---|
| Gas-Fired IC Engine | Operate Per Design Lean Gas Pretreatment with Positive Crankcase Ventilation | Electrostatic Precipitator Fabric Filter Wet Scrubber |

Because of the small amount of particulate emissions generated by LFG-fired sources, combustion controls are the only types of controls considered technically feasible for this type of source.

Electrostatic Precipitators (ESP): Particulate collection efficiency of an ESP is highly dependent on particle resistivity, but can be designed for efficiencies in excess of 99 percent. The collection efficiency is very sensitive to changes in fuel characteristics, gas properties, and particle size distribution. ESP's have a relatively high initial capital cost, but lower operating cost as compared to other particulate control devices. Both dry and wet ESP designs are available.

Fabric Filters: Baghouses can achieve particulate collection efficiencies in excess of 99 percent. The two major design and operational parameters which govern baghouse performance are: 1) air-to-cloth ratio, and 2) pressure drop. While the baghouses can provide a high collection efficiency over a wide range of particle sizes and particulate loadings, they are sensitive to humid gas streams which can cause bag blinding and failure.

Wet Scrubbers: Various types of wet scrubber systems are capable of providing high particulate collection efficiencies. The most common high efficiency wet scrubber, the venturi-type scrubber, utilizes the kinetic energy of a moving gas stream to atomize a scrubbing liquid into droplets, which in turn, contact and separate the particulate matter in the flue gas. A venturi consists of four sections: a converger, a throat, a diverger, and a separator. Liquid is injected into the high velocity gas stream either at the inlet to the converging section or at the venturi throat. Because of the gas velocity and physical shape of the scrubber, the injected liquids form films and filaments which shatter, resulting in an atomized liquid. Venturi scrubbers are characterized by high collection efficiencies (>99%) and relatively high power requirements.

6.3 Available LFG-fired IC Engine PM₁₀ Controls

The only particulate emissions control considered feasible for the LFG-fired IC engines is gas pretreatment technology in combination with good combustion control to limit particulates generated from partially-combusted carbon compounds, following the manufacturer's recommended operation and maintenance procedures.

6.4 Top-Down Evaluation of LFG-Fired IC Engine PM₁₀ Controls

The only PM₁₀ control technology considered technically feasible for the 16 IC engines is gas pretreatment technology in combination with proper combustion control. The engine manufacturer has attempted to minimize PM₁₀ emissions formation by developing a gas pretreatment technology which utilizes a condensate knockout tank to remove any free liquids and solids. The gas is then passed through several varying in size filters before being fed into the generator units. This reduces the possible impact of gaseous borne solids on the engines components and minimizes PM₁₀ emissions. Therefore, BACT is determined to be gas pretreatment in combination with proper operation and maintenance of each IC engine according to the manufacturer's recommendations.

6.5 Summary and Conclusion: PM₁₀ BACT Analysis

Two control technologies were evaluated: flue gas treatment control technology and proper operation and maintenance of the IC engines according to the manufacturer's recommendations in combination with gas pretreatment technology. Fabric filters, ESPs, and scrubbers were rejected as BACT as the IC engines do not generate sufficient particulate in the exhaust (1.6 tpy per engine, 26.1 tpy total for all engines) to warrant the evaluation of flue gas controls and are not cost effective.

BACT was determined to be 0.09 g/bhp-hr (0.121 g/bkw-hr, 0.37 lb/hr, 0.027 lb/MMBtu, 1.63 tpy) per engine, by gas pretreatment and proper operation and maintenance of each IC engine according to the manufacturer's recommendations. The gas pretreatment system will utilize a condensate knockout tank prior to the system blowers. After the gas is pressurized it passes through the blowers. The landfill gas then passes through a 10 micron filter and a 1 micron filter before being fed into the generator units. This treatment process reduces the possible impact of gaseous borne solids on the engines components and minimizes particulate emissions to the atmosphere. This value can be achieved at a reasonable cost effectiveness with no adverse environmental or energy impacts and is consistent with previous BACT determinations found in the search of the RBLC data base.

Ohio EPA emission-based rules which apply to the project are OAC Rule 3745-17-07(A)(1) which limits opacity to 20%, and OAC Rule 3745-17-11(B)(5)(b) which limits particulate emissions to 0.062 lb/MMBtu heat input. The proposed gas pretreatment technology for the power station IC engines will meet all of these requirements.

7.0 Site Description/Air Quality Designations

The EDI Carbon Limestone Facility installation is located in Air Quality Control Region 178. The area is attainment or attainment/unclassifiable for total suspended particulates, PM₁₀, SO₂, NO_x, CO, VOC (ozone) and lead.

7.1 Ambient Air Quality Monitoring Requirements

U.S. EPA regulations require a year of ambient air quality data to be obtained as part of the PSD application. An applicant may conduct monitoring on-site, model to demonstrate a "de minimus" impact, or used existing air quality data to fill some of the requirements of a PSD ambient air quality analysis. If monitoring is required, U.S. EPA has set up specific conditions on the acceptability of existing air quality monitors is to ensure the monitor is representative of air quality in the area.

In this instance, EDI Carbon Limestone has conducted ambient air quality modeling that predicts the ambient air quality impact of the source(s) to be less than the monitoring de minimus concentrations for each of the pollutants. Therefore, EDI Carbon Limestone would not be required to conduct pre-application monitoring. A summary is below:

| <u>Pollutant</u> | <u>Averaging Period</u> | <u>Predicted Concentration</u> | <u>Monitoring De Minimus Concentrations</u> |
|------------------|-------------------------|--------------------------------|---|
| NO ₂ | Annual | 4.86 ug/m ³ | 14 ug/m ³ |
| CO | 8-hour high | 65.0 ug/m ³ | 575 ug/m ³ |
| PM ₁₀ | 24-hour high | 2.16 ug/m ³ | 10 ug/m ³ |

7.2 Modeling

Air quality dispersion modeling was conducted to assess the effect of these sources on ambient air quality standards and PSD increments. The U.S. EPA Industrial Source Complex-Short Term (ISCST3, Version 00101) model was used for the refined modeling analysis. In addition, CTSCREEN (version 94111) was used to evaluate source receptor impacts for those receptors above stack tip.

The ISCST3, Version 00101 model was the appropriate model for the simple to intermediate terrain portion of the analysis due to the need to incorporate building wake effects, the need to predict both short-term and long-term (annual) average concentrations, and the need to incorporate impacts from multiple and separated emissions units.

The ISCST3, Version 00101 model was run with the regulatory default options (stack-tip downwash, buoyancy-induced dispersion, final plume rise), default wind speed profile categories, default potential temperature gradient, and no pollutant decay. Building downwash was assessed using either the Huber-Snyder or Schulman-Sire downwash methodology, depending on the stack and nearby building heights.

The ISCST3, Version 00101 model was run utilizing the National Weather Service meteorological data processed using the U.S. EPA PCRAMMET program. OEPA provided five years of the most recent PCRAMMET processed meteorological data on their bulletin board system. Following OEPA modeling guidance concerning representative meteorological data for various counties, the Youngstown Surface, Pittsburgh Upper Air (1987-1991) PCRAMMET data were used in the refined modeling analysis.

Building wake effects will influence emissions from stacks with heights less than Good Engineering Practice (GEP). The ISCST3, Version 97363 model requires input of building heights and projected building widths for 36 wind directions. The U.S. EPA Building Profile Input Program (BPIP) was used to determine the direction-specific building dimensions.

CTSCREEN was applied to a large ridge to the west and south of the proposed facility. Peak hourly impacts were scaled to other averaging times using the conversion factors contained within the model.

7.4 Significant Impact Analysis

Both ISCST3 and CTSCREEN were applied to the sources at the proposed facility to determine if the proposed facility would have impacts above the PSD significant impact increments. Peak facility impacts are presented below:

| <u>Pollutant</u> | <u>Averaging Period</u> | <u>Predicted Concentration</u> | <u>PSD Significant Concentration</u> |
|------------------|-------------------------|--------------------------------|--------------------------------------|
| NO ₂ | Annual | 4.88 ug/m ³ | 1 ug/m ³ |
| CO | 1-hour high | 363.0 ug/m ³ | 2000 ug/m ³ |
| | 8-hour high | 65.0 ug/m ³ | 500 ug/m ³ |
| PM ₁₀ | 24-hour high | 2.16 ug/m ³ | 5 ug/m ³ |
| | Annual | 0.43 ug/m ³ | 1 ug/m ³ |

Based on these results, only NO₂ is predicted to exceed the PSD significant impact increments. No additional modeling is required for PM₁₀ or CO.

7.5 PSD Increment Analysis

NO₂ increment consuming sources were identified by Ohio EPA and the Pennsylvania DNR to include with the EDI sources for full PSD increment evaluation. All interacting source impacts were modeled using ISCST3 since none were in the immediate vicinity of the proposed facility and could not be included as part of the CTSCREEN analysis. The peak overall PSD impact was 4.88 ug/m³ which is well below the acceptable PSD increment.

7.6 NAAQS Analysis

Other major NO₂ sources were identified by Ohio EPA and the Pennsylvania DNR to include with the EDI sources for full NAAQS evaluation. All interacting source impacts were modeled using ISCST3 since none were in the immediate vicinity of the proposed facility and could not be included as part of the CTSCREEN analysis. The peak overall impact was 36.6 ug/m³ (including a background of 28.2 ug/m³ which is well below the acceptable PSD increment.

7.7 Secondary Impact

The closest Class I area to the EDI Carbon Limestone Facility are the Dolley Sods and Otter Creek Class I wilderness areas which are approximately 150 miles to the southeast. Federal PSD regulation regulations require that the reviewing authority provide written notification of projects which may affect a Class 1 area. "May effect" is typically interpreted by EPA as a major source or major modification within 100 kilometers. Since the EDI Carbon Limestone Facility is located greater than 100 kilometers from any Class I area, and all modeled impacts are below Significant Impact Levels, the EDI Carbon Limestone Facility was not subject to the visibility analysis modeling.

Most of the designated vegetation screening levels are equivalent to or exceed NAAQS and/or PSD increments, so that satisfaction of NAAQS and PSD increment assures compliance with sensitive vegetation screening levels. For SO₂ 3-hour and annual averaging periods, sensitive screening levels are more stringent than comparable NAAQS standards. The EDI Carbon Limestone facility does not have significant emissions of SO₂.

It is not expected that there will be regional population, commercial, or industrial growth associated with this project.

8.0 Conclusions

Based upon the analysis of the permit to install application and its supporting documentation provided by Energy Development Incorporated, the Ohio EPA staff has determined that the proposed installation will comply with all applicable State and Federal environmental regulations and that the requirements for BACT are satisfied. The Ohio EPA staff recommends that a permit to install be issued to Energy Development Incorporated.



**Permit To Install
Terms and Conditions**

**Issue Date: To be entered upon final issuance
Effective Date: To be entered upon final issuance**

DRAFT PERMIT TO INSTALL 02-16880

Application Number: 02-16880
APS Premise Number: 0250050996
Permit Fee: **To be entered upon final issuance**
Name of Facility: Carbon Limestone LFG Power Station
Person to Contact: Leslie Cook
Address: 7700 San Felipe, Suite 480
Houston, TX 77063

Location of proposed air contaminant source(s) [emissions unit(s)]:
**8100 South Stateline Rd
Lowellville, Ohio**

Description of proposed emissions unit(s):
Chapter 31 modification to PTI 02-14296 to increase the allowable NOx emission limits.

The above named entity is hereby granted a Permit to Install for the above described emissions unit(s) pursuant to Chapter 3745-31 of the Ohio Administrative Code. Issuance of this permit does not constitute expressed or implied approval or agreement that, if constructed or modified in accordance with the plans included in the application, the above described emissions unit(s) of environmental pollutants will operate in compliance with applicable State and Federal laws and regulations, and does not constitute expressed or implied assurance that if constructed or modified in accordance with those plans and specifications, the above described emissions unit(s) of pollutants will be granted the necessary permits to operate (air) or NPDES permits as applicable.

This permit is granted subject to the conditions attached hereto.

Ohio Environmental Protection Agency

Director

Part I - GENERAL TERMS AND CONDITIONS**A. State and Federally Enforceable Permit To Install General Terms and Conditions****1. Monitoring and Related Recordkeeping and Reporting Requirements**

- a. Except as may otherwise be provided in the terms and conditions for a specific emissions unit, the permittee shall maintain records that include the following, where applicable, for any required monitoring under this permit:
 - i. The date, place (as defined in the permit), and time of sampling or measurements.
 - ii. The date(s) analyses were performed.
 - iii. The company or entity that performed the analyses.
 - iv. The analytical techniques or methods used.
 - v. The results of such analyses.
 - vi. The operating conditions existing at the time of sampling or measurement.
- b. 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 this permit. Such records may be maintained in computerized form.
- c. Except as may otherwise be provided in the terms and conditions for a specific emissions unit, the permittee shall submit required reports in the following manner:
 - i. Reports of any required monitoring and/or recordkeeping of federally enforceable information shall be submitted to the appropriate Ohio EPA District Office or local air agency.
 - ii. Quarterly written reports of (i) any deviations from federally enforceable emission limitations, operational restrictions, and control device operating parameter limitations, excluding deviations resulting from malfunctions reported in accordance with OAC rule 3745-15-06, that have been detected by the testing, monitoring and recordkeeping requirements specified in this permit, (ii) the probable cause of such deviations, and (iii) any corrective actions or preventive measures taken, shall be made to the appropriate Ohio EPA District Office or local air agency. The written 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. See B.9 below if no deviations occurred during the quarter.

- iii. Written reports, which identify any deviations from the federally enforceable monitoring, recordkeeping, and reporting requirements contained in this permit shall be submitted to the appropriate Ohio EPA District Office or local air agency every six months, i.e., by January 31 and July 31 of each year for the previous six calendar months. If no deviations occurred during a six-month period, the permittee shall submit a semi-annual report, which states that no deviations occurred during that period.
- iv. Each written report shall be signed by a responsible official certifying that, based on information and belief formed after reasonable inquiry, the statements and information in the report are true, accurate, and complete.

2. 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, i.e., upset, of any emissions units 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. (The definition of an upset condition shall be the same as that used in OAC rule 3745-15-06(B)(1) for a malfunction.) The verbal and written reports shall be submitted pursuant to 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 the emission unit(s) that is (are) served by such control system(s).

3. Risk Management Plans

If the permittee is required to develop and register a risk management plan pursuant to section 112(r) of the Clean Air Act, as amended, 42 U.S.C. 7401 et seq. ("Act"), the permittee shall comply with the requirement to register such a plan.

4. Title IV Provisions

If the permittee is subject to the requirements of 40 CFR Part 72 concerning acid rain, the permittee shall ensure that any affected emissions unit complies with those requirements. Emissions exceeding any allowances that are lawfully held under Title IV of the Act, or any regulations adopted thereunder, are prohibited.

5. Severability Clause

A determination that any term or condition of this permit is invalid shall not invalidate the force or effect of any other term or condition thereof, except to the extent that any other term or condition depends in whole or in part for its operation or implementation upon the term or condition declared invalid.

6. General Requirements

- a. The permittee must comply with all terms and conditions of this permit. Any noncompliance with the federally enforceable terms and conditions of this permit constitutes a violation of the Act, and is grounds for enforcement action or for permit revocation, revocation and reissuance, or modification, or for denial of a permit renewal application.
- b. It shall not be a defense for the permittee in an enforcement action that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the federally enforceable terms and conditions of this permit.
- c. This permit may be modified, reopened, revoked, or revoked and reissued, for cause. The filing of a request by the permittee for a permit modification, revocation and reissuance, or revocation, or of a notification of planned changes or anticipated noncompliance does not stay any term and condition of this permit.
- d. This permit does not convey any property rights of any sort, or any exclusive privilege.
- e. 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 request, the permittee shall also furnish to the Director or an authorized representative of the Director, copies of records required to be kept by this permit. For information claimed to be confidential in the submittal to the Director, if the Administrator of the U.S. EPA requests such information, the permittee may furnish such records directly to the Administrator along with a claim of confidentiality.

7. Fees

The permittee shall pay fees to the Director of the Ohio EPA in accordance with ORC section 3745.11 and OAC Chapter 3745-78. The permittee shall pay all applicable Permit To Install fees within 30 days after the issuance of this Permit To Install.

8. Federal and State Enforceability

Only those terms and conditions designated in this permit as federally enforceable, that are required under the Act, or any of its applicable requirements, including relevant provisions designed to limit the potential to emit of a source, are enforceable by the Administrator of the U.S. EPA, the State, and citizens under the Act. All other terms and conditions of this permit shall not be federally enforceable and shall be enforceable under State law only.

9. Compliance Requirements

- a. Any document (including reports) required to be submitted and required by a federally

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applicable requirement in this permit shall include a certification by a responsible official that, based on information and belief formed after reasonable inquiry, the statements in the document are true, accurate, and complete.

- b. Upon presentation of credentials and other documents as may be required by law, the permittee shall allow the Director of the Ohio EPA or an authorized representative of the Director to:
 - i. At reasonable times, enter upon the permittee's premises where a source is located or the emissions-related activity is conducted, or where records must be kept under the conditions of this permit.
 - ii. Have access to and copy, at reasonable times, any records that must be kept under the conditions of this permit, subject to the protection from disclosure to the public of confidential information consistent with ORC section 3704.08.
 - iii. Inspect at reasonable times any facilities, equipment (including monitoring and air pollution control equipment), practices, or operations regulated or required under this permit.
 - iv. As authorized by the Act, sample or monitor at reasonable times substances or parameters for the purpose of assuring compliance with the permit and applicable requirements.
- c. The permittee shall submit progress reports to the appropriate Ohio EPA District Office or local air agency concerning any schedule of compliance for meeting an applicable requirement. Progress reports shall be submitted semiannually, or more frequently if specified in the applicable requirement or by the Director of the Ohio EPA. Progress reports shall contain the following:
 - i. Dates for achieving the activities, milestones, or compliance required in any schedule of compliance, and dates when such activities, milestones, or compliance were achieved.
 - ii. An explanation of why any dates in any schedule of compliance were not or will not be met, and any preventive or corrective measures adopted.

10. Permit To Operate Application

- a. If the permittee is required to apply for a Title V permit pursuant to OAC Chapter 3745-77, the permittee shall submit a complete Title V permit application or a complete

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Title V permit modification application within twelve (12) months after commencing operation of the emissions units covered by this permit. However, if the proposed new or modified source(s) would be prohibited by the terms and conditions of an existing Title V permit, a Title V permit modification must be obtained before the operation of such new or modified source(s) pursuant to OAC rule 3745-77-04(D) and OAC rule 3745-77-08(C)(3)(d).

- b. If the permittee is required to apply for permit(s) pursuant to OAC Chapter 3745-35, the source(s) identified in this Permit To Install is (are) permitted to operate for a period of up to one year from the date the source(s) commenced operation. Permission to operate is granted only if the facility complies with all requirements contained in this permit and all applicable air pollution laws, regulations, and policies. Pursuant to OAC Chapter 3745-35, the permittee shall submit a complete operating permit application within ninety (90) days after commencing operation of the source(s) covered by this permit.

11. Best Available Technology

As specified in OAC Rule 3745-31-05, all new sources must employ Best Available Technology (BAT). Compliance with the terms and conditions of this permit will fulfill this requirement.

12. 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.

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B. State Only Enforceable Permit To Install General Terms and Conditions

1. Compliance Requirements

The emissions unit(s) identified in this Permit to Install shall remain in full compliance with all applicable State laws and regulations and the terms and conditions of this permit.

2. Reporting Requirements

The permittee shall submit required reports in the following manner:

- a. Reports of any required monitoring and/or recordkeeping of state-only enforceable 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 state-only required 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.)

3. Permit Transfers

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

4. Termination of Permit To Install

This permit to install shall terminate within eighteen months of the effective date of the permit to install if the owner or operator has not undertaken a continuing program of installation or modification or has not entered into a binding contractual obligation to undertake and complete within a reasonable time a continuing program of installation or modification. This deadline may

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be extended by up to 12 months if application is made to the Director within a reasonable time before the termination date and the party shows good cause for any such extension.

5. Construction of New Sources(s)

The proposed emissions unit(s) shall be constructed in strict accordance with the plans and application submitted for this permit to the Director of the Ohio Environmental Protection Agency. There may be no deviation from the approved plans without the express, written approval of the Agency. Any deviations from the approved plans or the above conditions may lead to such sanctions and penalties as provided under Ohio law. Approval of these plans does not constitute an assurance that the proposed facilities will operate in compliance with all Ohio laws and regulations. Additional facilities shall be installed upon orders of the Ohio Environmental Protection Agency if the proposed sources cannot meet the requirements of this permit or cannot meet applicable standards.

If the construction of the proposed emissions unit(s) has already begun or has been completed prior to the date the Director of the Environmental Protection Agency approves the permit application and plans, the approval does not constitute expressed or implied assurance that the proposed facility has been constructed in accordance with the approved plans. The action of beginning and/or completing construction prior to obtaining the Director's approval constitutes a violation of OAC rule 3745-31-02. Furthermore, issuance of the Permit to Install does not constitute an assurance that the proposed source will operate in compliance with all Ohio laws and regulations. Approval of the plans in any case is not to be construed as an approval of the facility as constructed and/or completed. Moreover, issuance of the Permit to Install is not to be construed as a waiver of any rights that the Ohio Environmental Protection Agency (or other persons) may have against the applicant for starting construction prior to the effective date of the permit. Additional facilities shall be installed upon orders of the Ohio Environmental Protection Agency if the proposed facilities cannot meet the requirements of this permit or cannot meet applicable standards.

6. Public Disclosure

The facility is hereby notified that this permit, and all agency records concerning the operation of this permitted source, are subject to public disclosure in accordance with OAC rule 3745-49-03.

7. Applicability

This Permit To Install is applicable only to the emissions unit(s) identified in the Permit To Install. Separate Permit To Install for the installation or modification of any other emissions unit(s) are required for any emissions unit for which a Permit To Install is required.

8. Construction Compliance Certification

The applicant shall provide Ohio EPA with a written certification (see enclosed form) that the

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facility has been constructed in accordance with the Permit To Install application and the terms and conditions of the Permit to Install. The certification shall be provided to Ohio EPA upon completion of construction but prior to startup of the source.

9. Additional Reporting Requirements When There Are No Deviations of Federally Enforceable Emission Limitations, Operational Restrictions, or Control Device Operating Parameter Limitations (See Section A of This Permit)

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.

C. Permit To Install Summary of Allowable Emissions

The following information summarizes the total allowable emissions, by pollutant, based on the individual allowable emissions of each air contaminant source identified in this permit.

SUMMARY (for informational purposes only)
TOTAL PERMIT TO INSTALL ALLOWABLE EMISSIONS

| <u>Pollutant</u> | <u>Tons Per Year</u> |
|------------------|----------------------|
| NOx | 343.4 |
| VOC | 47.7 |
| SO2 | 16.0 |
| PE | 61 |
| PM10 | 27.2 |
| CO | 580.3 |
| HCl | 9.6 |

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Part II - FACILITY SPECIFIC TERMS AND CONDITIONS

A. State and Federally Enforceable Permit To Install Facility Specific Terms and Conditions

1. Demonstrating compliance with the testing requirements of this permit shall be based upon testing three (3) of the units. If the results of testing three units demonstrate that either any of the three units tested are not in compliance with the permit allowable emissions limitations, or that there is greater than a 10% variance of each other, Ohio EPA may require the facility to demonstrate compliance by testing additional emissions units. Prior to issuance of a preliminary proposed Title V permit, the facility shall test an additional three (3) emissions units that have not been tested to date. After issuance of a Title V permit, the facility shall test three (3) emissions units at the time of each permit renewal, rotating through the existing emissions units until all have been tested at least once, then continuing to rotate through the emissions units in the order in which they were initially tested.
2. If for any reason, all generators at the facility are inoperable for more than 72 continuous hours, Ohio EPA Northeast District Office shall be notified by phone within the next 24 hours. Within thirty (30) days of restoring operation, the facility shall submit a report detailing the cause of the shutdown, appropriate corrective measures taken or repairs made, and precautionary measures to be taken to prevent a recurrence.

B. State Only Enforceable Permit To Install Facility Specific Terms and Conditions

1. The permit-to-install for emissions units P001 through P016 was evaluated based on the actual materials and the design parameters of the emissions unit's exhaust system, as specified by the permittee in the permit-to-install application. Ohio EPA's "Review of New Sources of Air Toxic Emissions" policy ("Air Toxic Policy") was applied for each pollutant emitted by this emissions unit using data from the permit-to-install application and the ISC model. The predicted 1-hour maximum ground-level concentration from the use of the ISC model was compared to the maximum acceptable ground-level concentration (MAGLC). The following summarizes the results of the modeling for the "worst case" pollutant(s):

Pollutant: Hydrogen Chloride

Ceiling Value (mg/m³): 2.47

Maximum Hourly Emission Rate (lbs/hr): 2.1

Predicted 1-Hour Maximum Ground-Level Concentration (µg/m³): 4.86

MAGLC (µg/m³): 57

Pollutant: Formaldehyde

Ceiling Value (mg/m³): 0.18

Maximum Hourly Emission Rate (lbs/hr): 0.60

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Predicted 1-Hour Maximum Ground-Level Concentration ($\mu\text{g}/\text{m}^3$): 1.42

MAGLC ($\mu\text{g}/\text{m}^3$): 4.3

Changes to or changes in the method of operation of the emissions unit after its installation or modification could affect the parameters used to determine whether or not the "Air Toxic Policy" is satisfied. Consequently, prior to making a change that could impact such parameters, the permittee shall conduct an evaluation to determine that the "Air Toxic Policy" will still be satisfied. If, upon evaluation, the permittee determines that the "Air Toxic Policy" will not be satisfied, the permittee will not make the change. Changes that can affect the parameters used in applying the "Air Toxic Policy" include the following:

- a. changes in the composition of the materials used (typically for coatings or cleanup materials), or the use of new materials, that would result in the emission of a compound with a lower threshold limit value (TLV), as indicated in the most recent version of the handbook entitled "American Conference of Governmental Industrial Hygienists (ACGIH)," than the lowest TLV value previously modeled;
- b. changes in the composition of the materials, or use of new materials, that would result in an increase in emissions of any pollutant with a listed TLV that was proposed in the application and modeled; and
- c. physical changes to the emissions unit or its exhaust parameters (e.g., increased/ decreased exhaust flow, changes in stack height, changes in stack diameter, etc.).

2. If the permittee determines that the "Air Toxic Policy" will be satisfied for the above changes, Ohio EPA will not consider the change(s) to be a "modification" under OAC rule 3745-31-01(VV)(1)(a)(ii), and a modification of the existing permit-to-install will not be required. If the change(s) is (are) defined as a modification under other provisions of the modification definition (other than (VV)(1)(a)(ii)), then the permittee shall obtain a final permit-to-install prior to the change.

The permittee shall collect, record, and retain the following information when it conducts evaluations to determine that the changed emissions unit will still satisfy the "Air Toxic Policy:"

- a. a description of the parameters changed (composition of materials, new pollutants emitted, change in stack/exhaust parameters, etc.);
- b. documentation of its evaluation and determination that the changed emissions unit still satisfies the "Air Toxic Policy"; and
- c. where computer modeling is performed, a copy of the resulting computer model runs that

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show the results of the application of the "Air Toxic Policy" for the change.

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Part III - SPECIAL TERMS AND CONDITIONS FOR SPECIFIC EMISSIONS UNIT(S)

A. State and Federally Enforceable Section

I. Applicable Emissions Limitations and/or Control Requirements

1. The specific operations(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 specified in narrative form following the table.

| <u>Operations, Property, and/or Equipment</u> | <u>Applicable Rules/Requirements</u> |
|--|--|
| <p>P001 - 1400 bkW (14.0 million Btu/hr) Deutz TBG 620 V16 K Internal combustion engine #1 to produce electricity from landfill gas. Using lean burn technology to meet best available control technology (BACT) requirements.</p> | <p>OAC rule 3745-31-05 (A)(3)</p> <p style="text-align: right;">40 CFR Part 60, Subpart WWW</p> <p style="text-align: right;">OAC rule 3745-17-11 (B)(5)</p> <p style="text-align: center;">40 CFR Part 52, Section 52.21 and OAC rules 3745-31-10 through -20</p> <p style="text-align: right;">OAC rule 3745-17-07 (A)</p> |

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| | <u>Applicable Emissions Limitations/Control Measures</u> | |
|------------------------|--|---|
| OAC rule 3745-18-06 | | PM ₁₀ emissions shall not exceed 0.4 pound per hour, nor 1.7 tons per year. |
| | Visible emissions shall not exceed 10% opacity as a six-minute average. | Non-methane organic compound (NMOC) emissions shall be reduced by 98 weight-percent or the outlet NMOC emissions shall be reduced to less than 20 parts per million by volume, dry basis (ppmvd) as hexane at 3 percent oxygen. |
| OAC rule 3745-21-08(B) | Sulfur dioxide (SO ₂) emissions shall not exceed 0.23 pound per hour, nor 1.0 ton per year. | |
| OAC rule 3745-21-07(B) | | |
| OAC rule 3745-23-06(B) | Hydrogen chloride (HCl) emissions shall not exceed 0.13 pound per hour, nor 0.6 tons per year. | The emissions limitation specified by this rule is less stringent than the emissions limitation established pursuant to OAC rule 3745-31-05(A)(3). |
| | Compliance with this rule also includes compliance with the requirements of 40 CFR Part 52, Section 52.21, and OAC rules 3745-31-10 through -20. | The emissions limitation specified by this rule is less stringent than the emissions limitation established pursuant to OAC rule 3745-31-05(A)(3). |
| | Compliance with this rule also includes compliance with the requirements of 40 CFR Part 60, Subpart WWW. | The emissions limitation specified by this rule is less stringent than the emissions limitation established pursuant to OAC rule 3745-31-05(A)(3). |
| | Carbon monoxide (CO) emissions shall not exceed 8.3 pounds per hour, nor 36.3 tons per year. | See I.2.b. |
| | Organic compound (OC) emissions shall not exceed 0.7 pound per hour, nor 3.0 tons per year. | See I.2.b. |
| | Oxides of nitrogen (NO _x) emissions shall not exceed 4.9 pounds per hour, nor 21.5 tons per year. | See I.2.b. |
| | Particulate emissions (PE) shall not exceed 0.9 pound per hour, nor 3.8 tons per year. | |

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- 2.a** The internal combustion engine shall operate using lean burn technology.
- 2.b** The permittee has satisfied the "best available control techniques and operating practices" required pursuant to OAC rule 3745-21-07(B) and the "latest available control techniques and operating practices" required pursuant to OAC rules 3745-21-08(B) and 3745-23-06(B) by committing to comply with the best available technology requirements established pursuant to OAC rule 3745-31-05(A)(3) in this permit-to-install (PTI).
- 2.c** This internal combustion engine is one of sixteen (16) internal combustion engines being permitted under this PTI.

II. Operational Restrictions

- 1. This emissions unit shall burn only landfill gas.
- 2. The permittee shall install, calibrate, maintain and operate according to the manufacturer's specifications a device at the inlet to the internal combustion engine which completely shuts off gas flow to the internal combustion engine when the internal combustion engine is not operating.
- 3. When the internal combustion engine is not operating, the landfill gas shall be diverted to the existing enclosed combustor at the Carbon Limestone Landfill or to an internal combustion engine that is operating.
- 4. The minimum allowable temperature of the internal combustion engine's combustion chamber shall be determined during the most recent compliance test. Currently, the minimum allowable temperature has been established as 335°C (633°F).
- 5. The allowable gas flow rate to the internal combustion engine's combustion chamber shall be determined during the most recent compliance test. Currently, the maximum allowable gas flow rate has been established, through testing as 415 standard cubic feet per minute.

III. Monitoring and/or Recordkeeping Requirements

- 1. The permittee shall perform weekly checks, when the emissions unit is in operation and when the weather conditions allow, for any visible particulate emissions from the stack serving each emissions unit. The presence or absence of any visible emissions shall be noted in an operations log for each unit. If visible emissions are observed, the permittee shall also note the following in the operations log:
 - a. the color of the emissions;
 - b. the cause of the visible emissions;

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- c. the total duration of any visible emissions incident; and,
 - d. any corrective actions taken to eliminate the visible emissions.
2. In order to demonstrate ongoing compliance with the requirement to reduce NMOC emissions by 98 weight-percent or reduce the outlet NMOC emissions to less than 20 parts per million by volume, dry basis (ppmvd) as hexane at 3 percent oxygen, the permittee shall:
 - a. install, calibrate, and maintain a temperature monitoring device equipped with a continuous recorder and having a minimum accuracy of +/- 1 percent of the temperature being measured expressed in degrees Celsius or +/- 0.5 degrees Celsius, whichever is greater.
 - b. install, calibrate, and maintain a device that records gas flow to or bypass of the control device. The gas flow rate measuring device shall record the flow to the control device at least every 15 minutes.
3. The permittee shall collect and record each day all 3-hour blocks of time during which the average combustion chamber temperature within the internal combustion engine was less than the allowable minimum operating temperature as established during the most recent compliance test.
4. The permittee shall collect and record each day all 3-hour blocks of time during which the average landfill gas flow rate to the internal combustion engine exceeds the maximum allowable gas flow rate as established during the most recent compliance test.
5. The permittee shall record each day when a fuel other than landfill gas was burned in this emissions unit.

IV. Reporting Requirements

1. The permittee shall submit semiannual written reports which (a) identify all days during which any visible particulate emissions were observed from the stack serving the emissions unit and (b) describe any corrective actions taken to eliminate the visible particulate emissions. These reports shall be submitted to the Northeast District Office of Ohio EPA by January 31 and July 31 of each year and shall cover the previous 6-month period.
2. The permittee shall submit deviation reports which identify the date(s) and duration the gas flow rate to the internal combustion engine exceeded the maximum gas flow rate requirements, as established during the most recent compliance stack test, as a three-hour average. These reports shall be submitted to the Northeast District Office of Ohio EPA by January 31 and July 31 of each

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year and shall cover the previous 6-month period.

3. The permittee shall submit deviation reports which identify the date(s) and duration the combustion chamber temperature of the internal combustion engine did not meet the minimum temperature requirements, as established during the most recent compliance stack test, as a three-hour average. These reports shall be submitted to the Northeast District Office of Ohio EPA by January 31 and July 31 of each year and shall cover the previous 6-month period.
4. The permittee shall submit deviation (excursion) reports that identify each day when a fuel other than landfill gas was burned in this emissions unit. Each report shall be submitted within 30 days after the deviation occurs.
5. Any breakdown or malfunction resulting in the emission of raw landfill gas emissions to the atmosphere shall be reported by phone to the Northeast District Office of Ohio EPA within one hour after the occurrence, or as soon as reasonably possible, and immediate remedial measures shall be undertaken to correct the problem and prevent further emissions to the atmosphere. A summary of the breakdown or malfunction, including the date(s) and time(s) and the measure(s) taken to correct the problem shall be included in the semi-annual deviation report.

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V. Testing Requirements

1. Emission Testing Requirement

The permittee shall conduct, or have conducted, emissions testing for this emissions unit in accordance with the following requirements:

- a. the emission testing shall be conducted in accordance with the Facility-wide term II.A.1 of this permit;
- b. the emission testing shall be conducted to demonstrate compliance with the allowable mass emission rate for particulate, nitrous oxides (NO_x), carbon monoxide(CO), organic compounds (OC), and hydrogen chloride (HCl);
- c. the emission testing shall be conducted to demonstrate compliance with either the removal of 98 weight-percent of NMOC or the reduction of the outlet concentration of NMOC to less than 20 parts per million by volume, dry basis (ppmvd) as hexane at 3 percent oxygen;
- d. the following test method(s) shall be employed to demonstrate compliance with the allowable mass emission rate(s): particulate - Method 5, NO_x - Method 7 or 7E, CO - Method 10, HCl - Method 26 or 26A, OC - Method 25 or 25A;
- e. upon request, emission testing shall be conducted to demonstrate compliance with the allowable mass emission rate for sulfur dioxide (SO₂), by employing test method 6C; and
- f. the test(s) shall be conducted while the emissions unit is operating at or near maximum capacity, unless otherwise specified or approved by the Ohio EPA, Northeast District Office.

Not later than 30 days prior to the proposed test date(s), the permittee shall submit an "Intent to Test" notification to the Northeast District Office of Ohio EPA. The "Intent to Test" notification shall describe in detail the proposed test methods and procedures, the emissions unit operating parameters, the time(s) and date(s) of the test(s), and the person (s) who will be conducting the test(s). Failure to submit such notification for review and approval prior to the test(s) may result in the Ohio EPA, Northeast District Office's refusal to accept the results of the emission test(s).

Personnel from the Ohio EPA, Northeast District Office shall be permitted to witness the test(s), examine the testing equipment, and acquire data and information necessary to ensure that the operation of the emissions unit and the testing procedures provide a valid characterization of the emissions from the emissions unit and/or the performance of the control equipment.

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A comprehensive written report on the results of the emissions test(s) shall be signed by the person or persons responsible for the tests and submitted to the Ohio EPA, Northeast District Office within 30 days following completion of the test(s). The permittee may request additional time for the submittal of the written report, where warranted, with prior approval from the Ohio EPA, Northeast District Office.

2. Compliance with the emission limitation(s) established in this permit shall be determined in accordance with the following method(s):

- a. Emission Limitation:

OC emissions shall not exceed 0.7 pound per hour, nor 3.0 tons per year.

Applicable Compliance Method:

Compliance with the hourly emission limitation shall be determined in accordance with the performance test requirement. Compliance with the annual limitation is based on the hourly emission rate multiplied by 8,760 (hours per year) and divided by 2,000 (pounds per ton).

- b. Emission Limitation:

Visible emissions shall not exceed 10% opacity as a six-minute average.

Applicable Compliance Method:

Compliance shall be demonstrated by using 40 CFR, Part 60, Appendix A, Method 9.

- c. Emission Limitation:

PE shall not exceed 0.9 pound per hour, nor 3.8 tons per year.

Applicable Compliance Method:

Compliance with the hourly emission limitation shall be determined in accordance with the performance test requirement. Compliance with the annual limitation is based on the hourly emission rate multiplied by 8,760 (hours per year) and divided by 2,000 (pounds per ton).

- d. Emission Limitation:

NO_x emissions shall not exceed 4.9 pounds per hour, nor 21.5 tons per year.

Applicable Compliance Method:

Compliance with the hourly emission limitation shall be determined in accordance with the performance test requirement. Compliance with the annual limitation is based on the hourly emission rate multiplied by 8,760 (hours per year) and divided by 2,000 (pounds per ton).

- e. Emission Limitation:

CO emissions shall not exceed 8.3 pounds per hour, nor 36.3 tons per year.

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Applicable Compliance Method:

Compliance with the hourly emission limitation shall be determined in accordance with the performance test requirement. Compliance with the annual limitation is based on the hourly emission rate multiplied by 8,760 (hours per year) and divided by 2,000 (pounds per ton).

- f. Emission Limitation:
SO₂ emissions shall not exceed 0.2 pound per hour, nor 1.0 ton per year.

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Applicable Compliance Method:

Compliance with the hourly emission limitation shall be determined in accordance with the performance test requirement. Compliance with the annual limitation is based on the hourly emission rate multiplied by 8,760 (hours per year) and divided by 2,000 (pounds per ton).

- g. Emission Limitation:
HCl emissions shall not exceed 0.1 pound per hour, nor 0.5 tons per year.

Applicable Compliance Method:

Compliance with the hourly emission limitation shall be determined in accordance with the performance test requirement. Compliance with the annual limitation is based on the hourly emission rate multiplied by 8,760 (hours per year) and divided by 2,000 (pounds per ton).

- h. Emission Limitation:
NMOC emissions shall be reduced by 98 weight-percent or the outlet NMOC emissions shall be reduced to less than 20 parts per million by volume, dry basis (ppmvd) as hexane at 3 percent oxygen.

Applicable Compliance Method:

Compliance with the control efficiency limitation shall be determined in accordance with the performance test requirement of section V.1.

VI. Miscellaneous Requirements

1. The equivalent pound per million Btu (lb/MMBtu) value is determined by multiplying the short term lb/hr emission limitation and dividing it by the engine size (14 MMBtu/hr).
2. The terms and conditions listed in this permit to install shall supercede all the air pollution control requirements for this emission unit contained in permit to install 02-14296 as issued on April 5, 2001.

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B. State Only Enforceable Section

I. Applicable Emissions Limitations and/or Control Requirements

1. The specific operations(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 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> |
|---|--------------------------------------|--|
| P001 - 1400 bkW (14.0 million Btu/hr) Deutz TBG 620 V16 K Internal combustion engine #1 to produce electricity from landfill gas. Using lean burn technology to meet best available control technology (BACT) requirements. | None. | None. |

2. Additional Terms and Conditions

2.a None.

II. Operational Restrictions

None.

III. Monitoring and/or Recordkeeping Requirements

None.

IV. Reporting Requirements

None.

V. Testing Requirements

None.

VI. Miscellaneous Requirements

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Carbon Limestone LFG Power Station

PTI Application: 02-16880

Issued: To be entered upon final issuance

Facility ID: 0250050996

None.

Issued: To be entered upon final issuance

Part III - SPECIAL TERMS AND CONDITIONS FOR SPECIFIC EMISSIONS UNIT(S)

A. State and Federally Enforceable Section

I. Applicable Emissions Limitations and/or Control Requirements

1. The specific operations(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 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> |
|--|--------------------------------------|--|
| P002 - 1400 bkW (14.0 million Btu/hr) Deutz TBG 620 V16 K Internal combustion engine to produce electricity from landfill gas. | None | None |

2. Additional Terms and Conditions

2.a None

II. Operational Restrictions

None

III. Monitoring and/or Recordkeeping Requirements

None

IV. Reporting Requirements

None

V. Testing Requirements

None

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Carbo

PTI A

Issued: To be entered upon final issuance

Emissions Unit ID: P002

VI. Miscellaneous Requirements

None

Issued: To be entered upon final issuance

B. State Only Enforceable Section

I. Applicable Emissions Limitations and/or Control Requirements

1. The specific operations(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 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> |
|--|--------------------------------------|--|
| P002 - 1400 bkW (14.0 million Btu/hr) Deutz TBG 620 V16 K Internal combustion engine to produce electricity from landfill gas. | OAC rule 3745-31-05 | LIMIT(s) |

2. Additional Terms and Conditions

2.a None

II. Operational Restrictions

None

III. Monitoring and/or Recordkeeping Requirements

None

IV. Reporting Requirements

None

V. Testing Requirements

None

VI. Miscellaneous Requirements

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Carbo

PTI A

Issued: To be entered upon final issuance

Emissions Unit ID: P002

None

Carbon Limestone LFG Power Station

Facility ID: 0250050996

PTI Application: 02-16880

Issued: To be entered upon final issuance

Part III - SPECIAL TERMS AND CONDITIONS FOR SPECIFIC EMISSIONS UNIT(S)

A. State and Federally Enforceable Section

I. Applicable Emissions Limitations and/or Control Requirements

1. The specific operations(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 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> |
|---|--------------------------------------|--|
| P003 - 1400 bkW (14.0 million Btu/hr) Deutz TBG 620 V16 K Internal combustion engine to produce electricity from landfill gas | None | None |

2. Additional Terms and Conditions

2.a None

II. Operational Restrictions

None

III. Monitoring and/or Recordkeeping Requirements

None

IV. Reporting Requirements

None

V. Testing Requirements

None

Emissions Unit ID: P003

Carbon Limestone LFG Power Station
PTI Application: 02-16880
Issued: To be entered upon final issuance

Facility ID: 0250050996

VI. Miscellaneous Requirements

None

Carbon Limestone LFG Power Station
PTI Application: 02-16880
Issued: To be entered upon final issuance

Facility ID: 0250050996

B. State Only Enforceable Section

I. Applicable Emissions Limitations and/or Control Requirements

1. The specific operations(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 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> |
|---|--------------------------------------|--|
| P003 - 1400 bkW (14.0 million Btu/hr) Deutz TBG 620 V16 K Internal combustion engine to produce electricity from landfill gas | OAC rule 3745-31-05 | LIMIT(s) |

2. Additional Terms and Conditions

2.a None

II. Operational Restrictions

None

III. Monitoring and/or Recordkeeping Requirements

None

IV. Reporting Requirements

None

V. Testing Requirements

None

VI. Miscellaneous Requirements

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Carbon Limestone LFG Power Station

PTI Application: 02-16880

Issued: To be entered upon final issuance

Facility ID: 0250050996

None

Carbo

PTI A

Emissions Unit ID: P004

Issued: To be entered upon final issuance**Part III - SPECIAL TERMS AND CONDITIONS FOR SPECIFIC EMISSIONS UNIT(S)****A. State and Federally Enforceable Section****I. Applicable Emissions Limitations and/or Control Requirements**

1. The specific operations(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 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> |
|---|--------------------------------------|--|
| P004 - 1400 bkW (14.0 million Btu/hr) Deutz TBG 620 V16 K Internal combustion engine to produce electricity from landfill gas | None | None |

2. Additional Terms and Conditions

2.a None

II. Operational Restrictions

None

III. Monitoring and/or Recordkeeping Requirements

None

IV. Reporting Requirements

None

V. Testing Requirements

None

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Carbo

PTI A

Issued: To be entered upon final issuance

Emissions Unit ID: P004

VI. Miscellaneous Requirements

None

Carbo

PTI A

Emissions Unit ID: P004

Issued: To be entered upon final issuance**B. State Only Enforceable Section****I. Applicable Emissions Limitations and/or Control Requirements**

1. The specific operations(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 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> |
|---|--------------------------------------|--|
| P004 - 1400 bkW (14.0 million Btu/hr) Deutz TBG 620 V16 K Internal combustion engine to produce electricity from landfill gas | OAC rule 3745-31-05 | LIMIT(s) |

2. Additional Terms and Conditions

2.a None

II. Operational Restrictions

None

III. Monitoring and/or Recordkeeping Requirements

None

IV. Reporting Requirements

None

V. Testing Requirements

None

VI. Miscellaneous Requirements

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Carbo

PTI A

Issued: To be entered upon final issuance

Emissions Unit ID: P004

None

Carbon Limestone LFG Power Station

Facility ID: 0250050996

PTI Application: 02-16880

Issued: To be entered upon final issuance

Part III - SPECIAL TERMS AND CONDITIONS FOR SPECIFIC EMISSIONS UNIT(S)

A. State and Federally Enforceable Section

I. Applicable Emissions Limitations and/or Control Requirements

1. The specific operations(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 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> |
|---|--------------------------------------|--|
| P005 - 1400 bkW (14.0 million Btu/hr) Deutz TBG 620 V16 K Internal combustion engine to produce electricity from landfill gas | None | None |

2. Additional Terms and Conditions

2.a None

II. Operational Restrictions

None

III. Monitoring and/or Recordkeeping Requirements

None

IV. Reporting Requirements

None

V. Testing Requirements

None

Carbon Limestone LFG Power Station
PTI Application: 02-16880
Issued: To be entered upon final issuance

Emissions Unit ID: P005
Facility ID: 0250050996

VI. Miscellaneous Requirements

None

Carbon Limestone LFG Power Station
PTI Application: 02-16880
Issued: To be entered upon final issuance

Facility ID: 0250050996

B. State Only Enforceable Section

I. Applicable Emissions Limitations and/or Control Requirements

1. The specific operations(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 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> |
|---|--------------------------------------|--|
| P005 - 1400 bkW (14.0 million Btu/hr) Deutz TBG 620 V16 K Internal combustion engine to produce electricity from landfill gas | OAC rule 3745-31-05 | LIMIT(s) |

2. Additional Terms and Conditions

2.a None

II. Operational Restrictions

None

III. Monitoring and/or Recordkeeping Requirements

None

IV. Reporting Requirements

None

V. Testing Requirements

None

VI. Miscellaneous Requirements

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Carbon Limestone LFG Power Station

PTI Application: 02-16880

Issued: To be entered upon final issuance

Facility ID: 0250050996

None

Issued: To be entered upon final issuance

Part III - SPECIAL TERMS AND CONDITIONS FOR SPECIFIC EMISSIONS UNIT(S)

A. State and Federally Enforceable Section

I. Applicable Emissions Limitations and/or Control Requirements

1. The specific operations(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 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> |
|---|--------------------------------------|--|
| P006 - 1400 bkW (14.0 million Btu/hr) Deutz TBG 620 V16 K Internal combustion engine to produce electricity from landfill gas | None | None |

2. Additional Terms and Conditions

2.a None

II. Operational Restrictions

None

III. Monitoring and/or Recordkeeping Requirements

None

IV. Reporting Requirements

None

V. Testing Requirements

None

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Carbo

PTI A

Issued: To be entered upon final issuance

Emissions Unit ID: P006

VI. Miscellaneous Requirements

None

Issued: To be entered upon final issuance

B. State Only Enforceable Section

I. Applicable Emissions Limitations and/or Control Requirements

1. The specific operations(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 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> |
|---|--------------------------------------|--|
| P006 - 1400 bkW (14.0 million Btu/hr) Deutz TBG 620 V16 K Internal combustion engine to produce electricity from landfill gas | OAC rule 3745-31-05 | LIMIT(s) |

2. Additional Terms and Conditions

2.a None

II. Operational Restrictions

None

III. Monitoring and/or Recordkeeping Requirements

None

IV. Reporting Requirements

None

V. Testing Requirements

None

VI. Miscellaneous Requirements

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Carbo

PTI A

Issued: To be entered upon final issuance

Emissions Unit ID: P006

None

Carbon Limestone LFG Power Station

Facility ID: 0250050996

PTI Application: 02-16880

Issued: To be entered upon final issuance

Part III - SPECIAL TERMS AND CONDITIONS FOR SPECIFIC EMISSIONS UNIT(S)

A. State and Federally Enforceable Section

I. Applicable Emissions Limitations and/or Control Requirements

1. The specific operations(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 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> |
|---|--------------------------------------|--|
| P007 - 1400 bkW (14.0 million Btu/hr) Deutz TBG 620 V16 K Internal combustion engine to produce electricity from landfill gas | None | None |

2. Additional Terms and Conditions

2.a None

II. Operational Restrictions

None

III. Monitoring and/or Recordkeeping Requirements

None

IV. Reporting Requirements

None

V. Testing Requirements

None

Emissions Unit ID: P007

Carbon Limestone LFG Power Station
PTI Application: 02-16880
Issued: To be entered upon final issuance

Facility ID: 0250050996

VI. Miscellaneous Requirements

None

Carbon Limestone LFG Power Station
PTI Application: 02-16880
Issued: To be entered upon final issuance

Facility ID: 0250050996

B. State Only Enforceable Section

I. Applicable Emissions Limitations and/or Control Requirements

1. The specific operations(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 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> |
|---|--------------------------------------|--|
| P007 - 1400 bkW (14.0 million Btu/hr) Deutz TBG 620 V16 K Internal combustion engine to produce electricity from landfill gas | OAC rule 3745-31-05 | LIMIT(s) |

2. Additional Terms and Conditions

2.a None

II. Operational Restrictions

None

III. Monitoring and/or Recordkeeping Requirements

None

IV. Reporting Requirements

None

V. Testing Requirements

None

VI. Miscellaneous Requirements

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Carbon Limestone LFG Power Station

PTI Application: 02-16880

Issued: To be entered upon final issuance

Facility ID: 0250050996

None

Issued: To be entered upon final issuance

Part III - SPECIAL TERMS AND CONDITIONS FOR SPECIFIC EMISSIONS UNIT(S)

A. State and Federally Enforceable Section

I. Applicable Emissions Limitations and/or Control Requirements

1. The specific operations(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 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> |
|---|--------------------------------------|--|
| P008 - 1400 bkW (14.0 million Btu/hr) Deutz TBG 620 V16 K Internal combustion engine to produce electricity from landfill gas | None | None |

2. Additional Terms and Conditions

2.a None

II. Operational Restrictions

None

III. Monitoring and/or Recordkeeping Requirements

None

IV. Reporting Requirements

None

V. Testing Requirements

None

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Carbo

PTI A

Issued: To be entered upon final issuance

Emissions Unit ID: P008

VI. Miscellaneous Requirements

None

Carbo

PTI A

Emissions Unit ID: P008

Issued: To be entered upon final issuance**B. State Only Enforceable Section****I. Applicable Emissions Limitations and/or Control Requirements**

1. The specific operations(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 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> |
|---|--------------------------------------|--|
| P008 - 1400 bkW (14.0 million Btu/hr) Deutz TBG 620 V16 K Internal combustion engine to produce electricity from landfill gas | OAC rule 3745-31-05 | LIMIT(s) |

2. Additional Terms and Conditions

2.a None

II. Operational Restrictions

None

III. Monitoring and/or Recordkeeping Requirements

None

IV. Reporting Requirements

None

V. Testing Requirements

None

VI. Miscellaneous Requirements

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Carbo

PTI A

Issued: To be entered upon final issuance

Emissions Unit ID: P008

None

Carbon Limestone LFG Power Station

Facility ID: 0250050996

PTI Application: 02-16880

Issued: To be entered upon final issuance

Part III - SPECIAL TERMS AND CONDITIONS FOR SPECIFIC EMISSIONS UNIT(S)

A. State and Federally Enforceable Section

I. Applicable Emissions Limitations and/or Control Requirements

1. The specific operations(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 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> |
|---|--------------------------------------|--|
| P009 - 1400 bkW (14.0 million Btu/hr) Deutz TBG 620 V16 K Internal combustion engine to produce electricity from landfill gas | None | None |

2. Additional Terms and Conditions

2.a None

II. Operational Restrictions

None

III. Monitoring and/or Recordkeeping Requirements

None

IV. Reporting Requirements

None

V. Testing Requirements

None

Carbon Limestone LFG Power Station
PTI Application: 02-16880
Issued: To be entered upon final issuance

Emissions Unit ID: P009
Facility ID: 0250050996

VI. Miscellaneous Requirements

None

Carbon Limestone LFG Power Station
PTI Application: 02-16880
Issued: To be entered upon final issuance

Facility ID: 0250050996

B. State Only Enforceable Section

I. Applicable Emissions Limitations and/or Control Requirements

1. The specific operations(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 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> |
|---|--------------------------------------|--|
| P009 - 1400 bkW (14.0 million Btu/hr) Deutz TBG 620 V16 K Internal combustion engine to produce electricity from landfill gas | OAC rule 3745-31-05 | LIMIT(s) |

2. Additional Terms and Conditions

2.a None

II. Operational Restrictions

None

III. Monitoring and/or Recordkeeping Requirements

None

IV. Reporting Requirements

None

V. Testing Requirements

None

VI. Miscellaneous Requirements

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Carbon Limestone LFG Power Station

PTI Application: 02-16880

Issued: To be entered upon final issuance

Facility ID: 0250050996

None

Carbo

PTI A

Emissions Unit ID: P010

Issued: To be entered upon final issuance**Part III - SPECIAL TERMS AND CONDITIONS FOR SPECIFIC EMISSIONS UNIT(S)****A. State and Federally Enforceable Section****I. Applicable Emissions Limitations and/or Control Requirements**

1. The specific operations(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 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> |
|---|--------------------------------------|--|
| P010 - 1400 bkW (14.0 million Btu/hr) Deutz TBG 620 V16 K Internal combustion engine to produce electricity from landfill gas | None | None |

2. Additional Terms and Conditions

2.a None

II. Operational Restrictions

None

III. Monitoring and/or Recordkeeping Requirements

None

IV. Reporting Requirements

None

V. Testing Requirements

None

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Carbo

PTI A

Issued: To be entered upon final issuance

Emissions Unit ID: P010

VI. Miscellaneous Requirements

None

Carbo

PTI A

Emissions Unit ID: P010

Issued: To be entered upon final issuance**B. State Only Enforceable Section****I. Applicable Emissions Limitations and/or Control Requirements**

1. The specific operations(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 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> |
|---|--------------------------------------|--|
| P010 - 1400 bkW (14.0 million Btu/hr) Deutz TBG 620 V16 K Internal combustion engine to produce electricity from landfill gas | OAC rule 3745-31-05 | LIMIT(s) |

2. Additional Terms and Conditions

2.a None

II. Operational Restrictions

None

III. Monitoring and/or Recordkeeping Requirements

None

IV. Reporting Requirements

None

V. Testing Requirements

None

VI. Miscellaneous Requirements

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Carbo

PTI A

Issued: To be entered upon final issuance

Emissions Unit ID: P010

None

Carbon Limestone LFG Power Station

Facility ID: 0250050996

PTI Application: 02-16880

Issued: To be entered upon final issuance

Part III - SPECIAL TERMS AND CONDITIONS FOR SPECIFIC EMISSIONS UNIT(S)

A. State and Federally Enforceable Section

I. Applicable Emissions Limitations and/or Control Requirements

1. The specific operations(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 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> |
|---|--------------------------------------|--|
| P011 - 1400 bkW (14.0 million Btu/hr) Deutz TBG 620 V16 K Internal combustion engine to produce electricity from landfill gas | None | None |

2. Additional Terms and Conditions

2.a None

II. Operational Restrictions

None

III. Monitoring and/or Recordkeeping Requirements

None

IV. Reporting Requirements

None

V. Testing Requirements

None

Emissions Unit ID: P011

Carbon Limestone LFG Power Station
PTI Application: 02-16880
Issued: To be entered upon final issuance

Facility ID: 0250050996

VI. Miscellaneous Requirements

None

Carbon Limestone LFG Power Station
PTI Application: 02-16880
Issued: To be entered upon final issuance

Facility ID: 0250050996

B. State Only Enforceable Section

I. Applicable Emissions Limitations and/or Control Requirements

1. The specific operations(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 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> |
|---|--------------------------------------|--|
| P011 - 1400 bkW (14.0 million Btu/hr) Deutz TBG 620 V16 K Internal combustion engine to produce electricity from landfill gas | OAC rule 3745-31-05 | LIMIT(s) |

2. Additional Terms and Conditions

2.a None

II. Operational Restrictions

None

III. Monitoring and/or Recordkeeping Requirements

None

IV. Reporting Requirements

None

V. Testing Requirements

None

VI. Miscellaneous Requirements

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Carbon Limestone LFG Power Station

PTI Application: 02-16880

Issued: To be entered upon final issuance

Facility ID: 0250050996

None

**Carbo
PTI A**

Emissions Unit ID: P012

Issued: To be entered upon final issuance

Part III - SPECIAL TERMS AND CONDITIONS FOR SPECIFIC EMISSIONS UNIT(S)

A. State and Federally Enforceable Section

I. Applicable Emissions Limitations and/or Control Requirements

1. The specific operations(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 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> |
|---|--------------------------------------|--|
| P012 - 1400 bkW (14.0 million Btu/hr) Deutz TBG 620 V16 K Internal combustion engine to produce electricity from landfill gas | None | None |

2. Additional Terms and Conditions

2.a None

II. Operational Restrictions

None

III. Monitoring and/or Recordkeeping Requirements

None

IV. Reporting Requirements

None

V. Testing Requirements

None

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Carbo

PTI A

Issued: To be entered upon final issuance

Emissions Unit ID: P012

VI. Miscellaneous Requirements

None

Carbo

PTI A

Emissions Unit ID: P012

Issued: To be entered upon final issuance**B. State Only Enforceable Section****I. Applicable Emissions Limitations and/or Control Requirements**

1. The specific operations(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 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> |
|---|--------------------------------------|--|
| P012 - 1400 bkW (14.0 million Btu/hr) Deutz TBG 620 V16 K Internal combustion engine to produce electricity from landfill gas | OAC rule 3745-31-05 | LIMIT(s) |

2. Additional Terms and Conditions

2.a None

II. Operational Restrictions

None

III. Monitoring and/or Recordkeeping Requirements

None

IV. Reporting Requirements

None

V. Testing Requirements

None

VI. Miscellaneous Requirements

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Carbo

PTI A

Issued: To be entered upon final issuance

Emissions Unit ID: P012

None

Carbon Limestone LFG Power Station

Facility ID: 0250050996

PTI Application: 02-16880

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Part III - SPECIAL TERMS AND CONDITIONS FOR SPECIFIC EMISSIONS UNIT(S)

A. State and Federally Enforceable Section

I. Applicable Emissions Limitations and/or Control Requirements

- 1. The specific operations(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 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> |
|---|--------------------------------------|--|
| P013 - 1400 bkW (14.0 million Btu/hr) Deutz TBG 620 V16 K Internal combustion engine to produce electricity from landfill gas | None | None |

2. Additional Terms and Conditions

2.a None

II. Operational Restrictions

None

III. Monitoring and/or Recordkeeping Requirements

None

IV. Reporting Requirements

None

V. Testing Requirements

None

Carbon Limestone LFG Power Station
PTI Application: 02-16880
Issued: To be entered upon final issuance

Emissions Unit ID: P013
Facility ID: 0250050996

VI. Miscellaneous Requirements

None

Carbon Limestone LFG Power Station
PTI Application: 02-16880
Issued: To be entered upon final issuance

Facility ID: 0250050996

B. State Only Enforceable Section

I. Applicable Emissions Limitations and/or Control Requirements

1. The specific operations(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 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> |
|---|--------------------------------------|--|
| P013 - 1400 bkW (14.0 million Btu/hr) Deutz TBG 620 V16 K Internal combustion engine to produce electricity from landfill gas | OAC rule 3745-31-05 | LIMIT(s) |

2. Additional Terms and Conditions

2.a None

II. Operational Restrictions

None

III. Monitoring and/or Recordkeeping Requirements

None

IV. Reporting Requirements

None

V. Testing Requirements

None

VI. Miscellaneous Requirements

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Carbon Limestone LFG Power Station

PTI Application: 02-16880

Issued: To be entered upon final issuance

Facility ID: 0250050996

None

Issued: To be entered upon final issuance

Part III - SPECIAL TERMS AND CONDITIONS FOR SPECIFIC EMISSIONS UNIT(S)

A. State and Federally Enforceable Section

I. Applicable Emissions Limitations and/or Control Requirements

1. The specific operations(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 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> |
|---|--------------------------------------|--|
| P014 - 1400 bkW (14.0 million Btu/hr) Deutz TBG 620 V16 K Internal combustion engine to produce electricity from landfill gas | None | None |

2. Additional Terms and Conditions

2.a None

II. Operational Restrictions

None

III. Monitoring and/or Recordkeeping Requirements

None

IV. Reporting Requirements

None

V. Testing Requirements

None

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Carbo

PTI A

Issued: To be entered upon final issuance

Emissions Unit ID: P014

VI. Miscellaneous Requirements

None

Issued: To be entered upon final issuance

B. State Only Enforceable Section

I. Applicable Emissions Limitations and/or Control Requirements

1. The specific operations(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 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> |
|---|--------------------------------------|--|
| P014 - 1400 bkW (14.0 million Btu/hr) Deutz TBG 620 V16 K Internal combustion engine to produce electricity from landfill gas | OAC rule 3745-31-05 | LIMIT(s) |

2. Additional Terms and Conditions

2.a None

II. Operational Restrictions

None

III. Monitoring and/or Recordkeeping Requirements

None

IV. Reporting Requirements

None

V. Testing Requirements

None

VI. Miscellaneous Requirements

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Carbo

PTI A

Issued: To be entered upon final issuance

Emissions Unit ID: P014

None

Carbon Limestone LFG Power Station

Facility ID: 0250050996

PTI Application: 02-16880

Issued: To be entered upon final issuance

Part III - SPECIAL TERMS AND CONDITIONS FOR SPECIFIC EMISSIONS UNIT(S)

A. State and Federally Enforceable Section

I. Applicable Emissions Limitations and/or Control Requirements

1. The specific operations(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 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> |
|---|--------------------------------------|--|
| P015 - 1400 bkW (14.0 million Btu/hr) Deutz TBG 620 V16 K Internal combustion engine to produce electricity from landfill gas | None | None |

2. Additional Terms and Conditions

2.a None

II. Operational Restrictions

None

III. Monitoring and/or Recordkeeping Requirements

None

IV. Reporting Requirements

None

V. Testing Requirements

None

Carbon Limestone LFG Power Station
PTI Application: 02-16880
Issued: To be entered upon final issuance

Emissions Unit ID: P015
Facility ID: 0250050996

VI. Miscellaneous Requirements

None

Carbon Limestone LFG Power Station
PTI Application: 02-16880
Issued: To be entered upon final issuance

Facility ID: 0250050996

B. State Only Enforceable Section

I. Applicable Emissions Limitations and/or Control Requirements

1. The specific operations(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 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> |
|---|--------------------------------------|--|
| P015 - 1400 bkW (14.0 million Btu/hr) Deutz TBG 620 V16 K Internal combustion engine to produce electricity from landfill gas | OAC rule 3745-31-05 | LIMIT(s) |

2. Additional Terms and Conditions

2.a None

II. Operational Restrictions

None

III. Monitoring and/or Recordkeeping Requirements

None

IV. Reporting Requirements

None

V. Testing Requirements

None

VI. Miscellaneous Requirements

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Carbon Limestone LFG Power Station

PTI Application: 02-16880

Issued: To be entered upon final issuance

Facility ID: 0250050996

None

Issued: To be entered upon final issuance

Part III - SPECIAL TERMS AND CONDITIONS FOR SPECIFIC EMISSIONS UNIT(S)

A. State and Federally Enforceable Section

I. Applicable Emissions Limitations and/or Control Requirements

- 1. The specific operations(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 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> |
|---|--------------------------------------|--|
| P016 - 1400 bkW (14.0 million Btu/hr) Deutz TBG 620 V16 K Internal combustion engine to produce electricity from landfill gas | None | None |

2. Additional Terms and Conditions

2.a None

II. Operational Restrictions

None

III. Monitoring and/or Recordkeeping Requirements

None

IV. Reporting Requirements

None

V. Testing Requirements

None

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Carbo

PTI A

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Emissions Unit ID: P016

VI. Miscellaneous Requirements

None

Issued: To be entered upon final issuance

B. State Only Enforceable Section

I. Applicable Emissions Limitations and/or Control Requirements

1. The specific operations(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 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> |
|---|--------------------------------------|--|
| P016 - 1400 bkW (14.0 million Btu/hr) Deutz TBG 620 V16 K Internal combustion engine to produce electricity from landfill gas | OAC rule 3745-31-05 | LIMIT(s) |

2. Additional Terms and Conditions

2.a None

II. Operational Restrictions

None

III. Monitoring and/or Recordkeeping Requirements

None

IV. Reporting Requirements

None

V. Testing Requirements

None

VI. Miscellaneous Requirements

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Carbo

PTI A

Issued: To be entered upon final issuance

Emissions Unit ID: P016

None