STAFF DRAFT ACTION DETERMINATION
FOR THE APPLICATION OF LAWRENCE ENERGY CENTER LLC
PREVENTION OF SIGNIFICANT DETERIORATION (PSD)
AIR PERMIT TO INSTALL NO. 07-00505
FOR THREE NATURAL GAS FIRED Siemens Westinghouse 501F TURBINES
TO BE LOCATED IN LAWRENCE COUNTY, OHIO

September 24, 2002

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

1. .THE PROJECT

Facility Description

Lawrence Energy Center LLC (Lawrence Energy), a subsidiary of Calpine Corporation, is proposing to develop a new combined-cycle electric generating facility in Hamilton Township, Lawrence County, Ohio. The proposed site is located on 280 acres of land in Lawrence County, situated along the north side of the Ohio River approximately 2 miles northwest of Worthington, Kentucky and approximately 5 miles northwest of Ironton, Ohio. The proposed facility will be equipped with the following emission units:

- three natural gas-fired combustion turbine generators (CTGs);
- three heat recovery steam generators (HRSGs), each of which will contain a natural gas-fired duct burner;
- a 22-cell mechanical draft cooling tower;
- a natural gas-fired auxiliary steam boiler;
- a diesel oil-fired emergency generator;
- +a diesel oil-fired fire water pump; and
- two natural gas-fired fuel preheaters.
- 20 space heaters

The proposed Project primarily involves the construction and operation of 3 fuel combustion turbines for the generation of electricity. Pipeline natural gas will be used as fuel in the CTGs and duct burners. The natural gas will have a maximum sulfur content of 2 grains per 100 standard cubic feet (gr/100 scf)

The permittee is required to perform Best Available Control Technology (BACT) review for NOx, SO_2, CO, PM_{10}, H_2SO_4 and VOC. The emissions limits based on the BACT requirements are listed under 40 CFR 52.21 and OAC rule 3745-31-(10) through (20) above. The following determinations have been made for each pollutant:

PM- Burning natural gas in an efficient combustion turbine. For this permit, it is assumed that all PM emissions are PM_{10}.

NOx- Use of dry low-NO_X (DLN) burners and employment of selective catalytic reduction (SCR) with a controlled rate of 3.0 ppmvd at 15% oxygen.

CO- Use of oxidation catalyst with a rate of 2.0 ppmvd at 15% oxygen without duct firing or use of power augmentation at greater than 75% load and 10 ppmvd at 15% oxygen with duct firing and

use of power augmentation including operational periods of 60 - 75% load. And CO emissions will be minimized through the use of good combustion practices (GCP).

VOC- Combustion controls and use of an oxidation catalyst.

SO_2- Burning natural gas in an efficient combustion turbine and burning low sulfur fuel.

H_2SO_4-Burning natural gas in an efficient combustion turbine.

Nitrogen oxides (NO_X) emissions will be minimized through the use of dry low-NO_X (DLN) burners and selective catalytic reduction (SCR).

Carbon dioxide (CO) emissions will be minimized through the use of good combustion practices (GCP) and through the use of a catalytic oxidation to reduce CO emissions by at least 80%.

Particulate emissions will be released from the cooling towers due to drift. The particulate matter is the result of concentration of dissolved solids in the cooling water system. This loss will be minimized through the use of drift eliminators.

The Project is designed to be a nominal 810 MW energy facility and will utilize advanced gas turbine/steam turbine, combined-cycle technology to generate electricity. When the three gas turbines are fired at their maximum capability with the heat recovery steam generator and while using auxiliary firing, the maximum net plant output will be approximately 1,100 MW. The Project will be designed to operate exclusively on natural gas.

2. RULE APPLICABILITY

Air Quality Designations

Under Section 107 of the Clean Air Act as of June 24, 1992, this area (Lawrence County) was classified as attainment for all of the criteria pollutants, i.e., total suspended particulates, particulate matter less than 10 microns, sulfur dioxide, nitrogen oxides, carbon monoxide, lead, and volatile organic compounds (ozone).

New Source Review (NSR)/PSD Applicability

This facility is classified as a “major” stationary source because the potential emissions exceed 250 tons per year of one of the criteria pollutants (SO2, PM, NO_X and CO) threshold level in an attainment area and thus would be classified as a major stationary air source under the federal Prevention of Significant Deterioration (PSD) program. Since the facility is a “major” stationary source for PSD, any additional pollutants that would emit a regulated pollutant at a rate in excess of the significance levels would require the facility to perform a PSD analysis for those pollutants. Table 1 shows the potential emissions of these pollutants:

Table 1, Potential Emissions and significant Thresholds

Pollutant	Tons/Year #	Significant Level
Nitrogen Oxides (NO_X)	578	40
Sulfur Dioxide (SO_2)	213	40
Particulate Matter*(PM)	342	15
Carbon Monoxide (CO)	1618	100
Volatile Organic Compounds(VOC)	449	40
Sulfuric Acid Mist (H_2SO_4)	48.6	7

The result is that Lawrence Energy submitted a PSD analysis for the following pollutants: NOx, VOC, PM*, SO_2, CO, and H_2SO_4.

* Particulate Matter and Particulate Matter <10 are assumed to be the same.

New Source Performance Standards (NSPS) Applicability

Each of the combined cycle gas fired combustion turbines augmented with supplementary natural gas fired duct burners is subject to 40 CFR 60 Subpart GG, "Standards of Performance for Stationary Gas Turbines" and 40 CFR 60 Subpart Da, "Standards of Performance for Electric Utility Steam Generating Units for Which Construction is Commenced After September 18, 1978".

The Stationary Gas Turbine NSPS applies to emissions for NO_X and SO_2. The emission standard for NO_X emissions applicable to the combustion turbine [from the equation in 40 CFR 60.332(a)(1)] is 0.0075 percent by volume (75 ppmv) at 15 percent oxygen on a dry basis. This standard is applicable to either fuel oil or natural gas combustion. The emission standard for SO_2 emissions applicable to the combustion turbine [from the equation in 40 CFR 60.333(b)] is 0.015 percent by volume (150 ppmv) at 15 percent oxygen on a dry basis. SO_2 emissions from combustion turbines are further limited by 40 CFR 60.333(b) which prohibits burning fuel that contains sulfur in excess of 0.8 percent by weight.

The auxiliary boiler (99 MMbtu/hr on an HHV) is subject to 40 CFR 60 Subpart Dc, "Standards of Performance for Small Industrial/Commercial/Institutional Steam Generating Units".

Federal Acid Rain Program (40 CFR 72 thru 78)

The Federal Acid Rain Program requirements require a Title IV permit application be submitted 24 months before operation.

National Emission Standards for Hazardous Air Pollutants (NESHAP) Part 63, 112(g) and OAC Rule 3745-31-28 Applicability

Currently there are no standards that have been promulgated for this project. If no standard has been promulgated, then the project is evaluated based upon the amount of Hazardous Air Pollutants emitted. The Lawrence Energy facility based HAP emissions upon potential to emit calculations, which demonstrated that they will emit less than threshold emissions levels thereby avoiding the requirement to submit a Maximum Achievable Control Technology (MACT) determination.

The duct burners associated with this project are exempt from this applicability due to these units meeting the definition of electric steam generating unit.

3. BACT REVIEW AND DETERMINATION

As part of the application for any emissions unit regulated under the PSD requirements, as analysis must be conducted that demonstrates that BACT will be employed. In this case, the BACT analysis was conducted for NO_x, SO_2, PM*, PM_{10}, CO, and VOC. For the purposes of performing a BACT analysis, the above emissions listed in Table 1 are described in the following sections.

The "Lawrence Energy Center" facility is subject to PSD regulations which mandates a case-by-case Best Available Control Technology (BACT) analysis be performed for the following pollutants: NO_x, SO_2, PM*, PM_{10}, CO, and VOC. The application used a "top-down" approach to determine an appropriate level of control. Preconstruction review for new or modified air pollutant sources involves an evaluation of the use of BACT and/or BAT. BAT must be employed on a pollutant-by-pollutant

basis for all new or modified air pollutant sources for which a PTI is required. Once PSD review is triggered, as is the case for this Project, BACT must be employed for each air pollutant that is emitted at a rate that exceeds its pollutant-specific PSD significant emission rate. BAT and BACT evaluations are performed on a Project-specific basis. Because BACT applies only to pollutants emitted in "major" amounts, BAT review is usually performed for pollutants emitted in amounts that are less than major but still require a PTI to be obtained. Selection of BAT can be based on work practices as well as the use of add-on control devices and must consider the cost-effectiveness of the selected technique. BACT, on the other hand, is an emission limit and cannot include work practice standards. Like BAT, selection of an emission limit that represents BACT must consider the economics of the selection as well as the energy and environmental impacts that could result from use of the technique or technology.

The BACT analysis for the Lawrence Energy Center LLC uses the top-down procedure published by USEPA in 1990. The method, as outlined in the New Source Review Workshop Manual, identifies the following steps as part of a BACT review:

- Identify all control technologies
- Eliminate technically infeasible options
- Rank remaining control technologies by control effectiveness
- Evaluate the most effective controls and document results
- Select BACT

Based on Project emissions, a BACT evaluation is required for NO_x, CO, PM_{10}, VOC, SO_2, and H_2SO_4. A BACT evaluation is required for the CTGs, duct burners, and the mechanical draft cooling tower; for the cooling tower only PM_{10} requires a BACT evaluation. The Project will include several minor emission units, including a fire water pump and emergency generator (which will require a small fuel oil storage tank), two natural gas-fired heaters (one standby) to preheat the natural gas for the CTGs, and an auxiliary boiler firing natural gas to accelerate facility start-up. The various small combustion units (i.e., fire water pump, emergency generator, and preheaters) and the fuel oil tank emit NO_x, CO, PM_{10}, VOC, and SO_2. Due to size and/or hours of operation, the small combustion units and fuel oil tank are not required to obtain PTIs. Nevertheless, Lawrence Energy would prefer to obtain a PTI for each of the small combustion units.

The auxiliary boiler and gas preheaters will use good combustion practices (GCP) and LNB to minimize emissions. Units of this size are generally not required to employ add-on controls to reduce emissions. Therefore, emissions resulting from the use of GCP and LNB for the boiler and preheaters are considered BACT for the auxiliary boiler. The hours of operation of the fire water pump and emergency engine will be limited to control emissions from these units.

As a starting point, databases maintained by the USEPA and Ohio EPA are reviewed to obtain a summary of previous BACT/BAT evaluations. These evaluations allow an Applicant to identify control technologies in use at other similar facilities. The database review is then followed by a site-specific review of the emission reduction technique(s) to be incorporated into a proposed Project. Selection of BACT/BAT is then performed while considering the requirements of the evaluation as defined in OAC 3745-31-01.

The USEPA RACT/BACT/LAER Clearinghouse (RBLC) was reviewed for data pertaining to NO_X, CO, PM_{10} , VOC, SO_2 and H_2SO_4 emission control methods. The RBLC contains information on 172 related projects. In addition, a similar search was conducted on the Ohio EPA BAT database. Since these databases are not always up to date, the current review was enhanced with information received from Ohio EPA and other recent permit applications. Information from these data sources has been condensed to only present data from comparable units for each pollutant-specific BACT evaluation.

3.1. BACT for Nitrogen Oxides

3.1.1. Discussion of NO_X Control Options

Nitrogen oxide emissions from combustion turbines and duct burners consist of two types: thermal NO_X and fuel-related NO_X. Thermal NO_X is formed by the high temperature reaction of nitrogen and oxygen during combustion. The amount formed is a function of the combustion chamber design and the combustion turbine operating parameters, including flame temperature, residence time at flame temperature, combustion pressure, and fuel/air ratios in the primary combustion zone. Fuel NO_X is formed by the gas-phase oxidation of fuel-bound nitrogen. Fuel NO_X formation is largely independent of combustion temperature and the nature of the organic nitrogen compound; rather, its formation is dependent on fuel nitrogen content and combustion oxygen levels. Natural gas contains a negligible amount of fuel-bound nitrogen. Therefore, only thermal NO_X is formed by natural gas-fired combustion turbines and duct burners.

3.1.2. Review of NO_X BACT Database

The RBLC and the Ohio BAT database were screened to identify natural gas-fired combined-cycle CTGs for this NO_X BACT analysis. Based on a review of the BACT information, with the exception of one small generating unit, the BACT determinations for all recently permitted combined-cycle projects are based on the use of DLN burner technology in combination with SCR. The exception is one small combustion turbine that was permitted to employ water injection in combination with $SCONO_X$™. Table 4-2, submitted with the permit application, summarizes the pertinent projects resulting from the database search.

3.1.3. Identification of NO_X Control Options

Control technologies considered in the BACT analysis must meet applicable NSPS requirements to be considered viable. The following options were identified for controlling NO_X emissions:

- SCR
- DLN for the CTGs
- LNB for the duct burners
- Water Injection
- Selective Non-catalytic Reduction (SNCR)
- Non-Selective Catalytic Reduction (NSCR)
- $SCONO_X$ System
- Xonon™

3.1.4. Review of NO_X Control Options

Water Injection – Water injection reduces the fuel combustion temperature and inhibits the formation of thermal NOx. However, water injection cannot be used with DLN combustors, and additionally cannot achieve NO_X emission levels as low as DLN combustors, so it is considered technically infeasible.

SNCR – Selective non-catalytic reduction requires the addition of ammonia or a similar type of selective reductant in the combustion zone where the temperature is in the 1,500 to 2,000^{O}F range. The proposed Project gas turbines exhaust temperature at the turbine exit is in the 980 to 1,135^{O}F range during normal operation (although the duct burner exit temperature could go as high as 1,600^{O}F). SNCR is not considered feasible because it cannot cover the full range of expected operating temperatures.

NSCR – Non-selective catalytic reduction is the catalytic approach used to control NO_X emissions from mobile sources such as automobiles. For this approach to work, the combustion process is run in a fuel-rich mode to generate unburned hydrocarbon radicals. These compounds then serve as the non-selective reactant for the NO_X reduction reactions. An additional oxidation catalyst is then required behind the reduction catalyst to complete the oxidation process so that VOC emissions are not increased. Use of this approach is considered technically infeasible because the DLN combustors are not designed to run in a fuel-rich mode. In addition, this approach increases the likelihood of additional VOC emissions from the process.

$SCONO_X$ – $SCONO_X$ is a trade name for a proprietary NO_X control technology being marketed by Goal Line Technologies. The Environmental Systems division of Alstom Power is the licensee for $SCONO_X$ systems on combustion turbine units over 100 MW. On December 1, 1999, Alstom Power issued a press release announcing the commercial offering of the $SCONO_X$ process for large combustion turbines. In spite of this announcement of the availability of a commercial offering for "any size" combustion turbine combined-cycle system, it is important to recognize that the largest unit on which $SCONO_X$ has operated is the 28 MW LM2500 unit at the Federal Facility in California. The 28 MW combined-cycle Federal Facility is much smaller than one of the Project's combined-cycle units. The Federal Facility is also owned by one of the partners of Goal Line Technologies.

The $SCONO_X$ system uses a potassium carbonate-coated catalyst to oxidize CO to CO_2 and reduce NO_X to N_2 and water. The $SCONO_X$ bed preferentially absorbs sulfur compounds. If sulfur is a problem (which it has been even for natural gas-fired facilities using this technology), then a catalyst bed (known as $SCOSO_X^{TM}$) is placed before the $SCONO_X$ catalyst to capture the sulfur compounds. The process operates at the exhaust of the HRSG where the exhaust temperature is 350 to 450^oF. The potassium carbonate must be regenerated frequently with a reducing gas to remain effective. Natural gas is used to generate hydrogen gas, which is then used for regeneration of the catalyst beds. This regeneration requires sophisticated dampers and ductwork. The potassium carbonate catalyst bed is also rejuvenated every 6 months to a year by dipping the catalyst beds in a solution of potassium carbonate.

There has been no experience scaling up the large dampers and duct work associated with $SCONO_X$ by a factor of 20. Recently proposed large scale projects involving $SCONO_X$ include the following:

- The La Paloma Project near the town of McKittrick, California is a 1,048 MW facility licensed with the ability to use either SCR or $SCONO_X$ for NO_X control. Construction is currently proceeding using SCR only; $SCONO_X$ is not being installed at that site.
- The Otay Mesa Project in California is a 510 MW facility for which a final permit has not been issued. Again, the draft permit allows for the use of either SCR or $SCONO_X$ at the same emission level. Vendor guarantees for $SCONO_X$ were not available when requested by the reviewing agency.
- The Nueva Azalea Project (formerly the Sunlaw Cogeneration Partners I), a 550 MW facility proposed in the city of South Gate, California, is being developed by one of the co-owners of the $SCONO_X$ process. This project is currently under review, and is clearly intended as a demonstration project it if is approved.

Based upon available information, $SCONO_X$ is considered to be infeasible for the following reasons:

- Lack of demonstrated technology at a facility independent from the manufacturer;
- The extremely large scale-up required;
- The critical dependence of the $SCONO_X$ system on numerous moving parts (louvers) in the HRSG to provide an air-tight seal at high temperatures on portions of the system for periodic catalyst regeneration;
- Unknown length and extent of catalyst degradation and the lack of information on long-term commercial availability of catalyst material;

- Lack of adequate demonstration for the proposed sulfur removal system ($SCOSO_X$); and
- Lack of demonstration of the recommended methane regeneration methodology.

Xonon – A new NO_X control technology for combustion turbines, known as the Xonon Combustion System, is being developed for large turbine engine applications. The concept differs from end-of-pipe controls such as $SCONO_X$ and SCR in that it is comprised of a catalyst that is placed in the turbine combustors, permitting the fuel and air to burn at lower temperatures and, consequently, causing lower NO_X formation without addition of ammonia or urea. The catalyst life is not known but is expected to be short. Preliminary test data indicate an exhaust NO_X concentration of about 3 ppmvd. One commercial facility is known to use Xonon, a 1.5 MW Kawasaki M1A-13A gas turbine at a Silicon Valley Power facility in Santa Clara, California. This turbine commenced commercial operation in 1999. Because the turbines at the Lawrence Energy Project are more than 100 times larger than the Kawasaki M1A-13A, and no other commercial facilities are known to employ Xonon, the technology is currently considered technically infeasible for the Lawrence Energy Project.

3.1.5. Technically Feasible NO_X Control Options

The three technically feasible NO_X control technologies are DLN burners, LNB for the duct burners, and SCR.

DLN Burners – Prior to the development of premix based DLN burners, fuel and air were injected separately into the combustion zone of a turbine where oxygen in the combustion air diffused to the flame front located at the fuel burner. The result of this approach was a range of fuel-to-air ratios over which combustion occurred at a corresponding range of flame temperatures. The DLN burner combustion process works to reduce the amount of thermal NO_X that is formed by lowering the overall temperature within the combustion turbine combustion zone. The lowered flame temperature is accomplished by premixing the fuel and air at controlled stoichiometric ratios prior to combustion. This method of control reduces NO_X emissions from the Siemens Westinghouse turbine to 25 ppmvd at 15 percent O_2, and is proposed for the Project.

SCR – Selective catalytic reduction is often coupled with DLN combustion to reduce thermal NO_X. SCR is a post-combustion control technology in which ammonia reacts with NO_X in the presence of a catalyst to form N_2 and water. The active surface of the catalyst is usually a noble metal, base metal (titanium or vanadium) oxide, or a zeolite-based material. SCR systems operate in the 500 to 800^{o}F range. An ammonia injection grid is located upstream of the catalyst body and designed to disperse ammonia throughout the exhaust flow before it enters the catalyst unit. The desired level of NO_X control is a function of the catalyst volume and ammonia-to-NO_X ratio. Increasing the ammonia-to-NO_X ratio for a given catalyst volume can achieve higher NO_X emission reductions but can also result in unreacted ammonia, which is emitted as ammonia slip.

LNB for Duct Burners – Low NO_x burners reduce NO_x emissions by combusting the fuel in stages. Staging partially delays the combustion process, resulting in a cooler flame, which suppresses thermal NO_x formation. The two most common types of low NO_x burners are staged air burners and staged fuel burners. Staged air burners have a maximum NO_x reduction efficiency of about 30 percent. Staged fuel burners have a maximum NO_x emission reduction efficiency of approximately 55 percent. Low NO_x duct burners are proposed for the Project.

3.1.6. Effectiveness of Technically Feasible NO_X Control Options

BACT determinations for NO_X have varied from 2.5 to 5.0 ppmvd. Only three systems define BACT as less than 3.5 ppmvd, with the overall average being approximately 4 ppmvd. All of the projects with BACT NO_X emission rate limits below 3.5 ppmvd are located in California. CEMS experience at the Sacramento Power Authority (utilizing DLN/SCR) and Sunlaw (Federal) Cogeneration (utilizing $SCONO_X$) facilities has shown that permitted NO_X emission rate limits are not always met. In fact, CEMS data show dozens of exceedances of the NO_X emission rate limit during periods when the $SCONO_X$ system was operating at the Federal Cogeneration facility. NO_X BACT emission rate limits below 3.5 ppmvd are also subject to an emission rate measurement uncertainty of ± 1 ppmvd.

Based on the information from the RBLC and state agencies, the proposed BACT level for the Project's electric generating units are 3.0 ppmvd, corrected to 15 percent O_2, based on an 1-hour average.

The low NO_X emission rate achievable through the use of add-on control technology cannot always be met during start up, shutdown, and malfunctions. The SCR system cannot achieve these low rates during these periods until the system reaches the required operating temperature. The proposed BACT level, therefore, will not be applicable to periods of start up, shutdown, and malfunction.

3.1.7. Economic Evaluation of NO_X Control Options

Capital costs associated with the installation of an SCR system were based on a vendor quotation for a similar Project. Capital costs associated with installation of a $SCONO_X$ system were based on vendor quotations for the Metcalf Energy project in California. No costs are presented for the DLN combustors or LNBs since the burners are an integral part of the CTG and duct burner designs. Capital costs and annualized costs were developed using the procedures presented in Ohio EPA's Guidance for Estimating Capital and Annual Costs of Air Pollution Control Systems (presented in Engineering Guide 46). The cost-effectiveness of the NO_X control system was then calculated by dividing the total annual cost by the annual tons of pollutant removed.

The SCR shall control NO_x to 3.0 ppmvd, corrected to 15 percent O_2, yielding a removal efficiency of greater than 86 percent. $SCONO_x$ was also assumed to control NO_x to 3.5 ppmvd, corrected to 15 percent O_2, also yielding a removal efficiency of 86 percent. Table 4-4, submitted with the permit application, presents the capital cost of the SCR system. Table 4-5 in the permit application presents a summary of the total annualized cost and the cost-effectiveness of the SCR system. Table 4-6 in the permit application, presents the capital costs of the $SCONO_x$ system. Table 4-7 in the permit application presents the annualized cost and the cost-effectiveness of the $SCONO_x$ system. Tables 4-5 and 4-7 in the permit application, both show that the total amount of NO_x removed will be 2,645 tpy based on a total of 2,000 hours of maximum CTG and duct burner firing with power augmentation in the winter (1,000 hours, Case 25T+DB) and summer (1,000 hours, Case 1T+DB) plus 6,760 hours of maximum CTG and duct burner firing during the remainder of the year (Case 12T+DB).

Based on the annualized cost values and 2,645 tons of NO_x removed, SCR coupled with DLN and LNB has a cost-effectiveness of $1,427/ton of NO_x removed. The cost-effectiveness of $SCONO_x$ is over five times higher, at $7,544/ton of NO_x removed.

3.1.8. Energy and Environmental Considerations

Application of either SCR or $SCONO_x$ will produce an impact on the Project's energy efficiency. Installation of either system will increase the back pressure in the turbine exhaust flow, which lowers power generation efficiency. Additional fuel must then be consumed to offset this lost power.

Performance loss values of 0.2 percent (turbine only) and 0.8 percent (combined-cycle) for SCR and $SCONO_x$, respectively, have been estimated for this Project by Lawrence Energy. Tables 4-5 and 4-7, submitted with the permit application, itemize the annual energy impact of the two systems. The energy loss impacts of employing SCR and $SCONO_x$ are approximately 1 and 8 MW, respectively.

Other environmental impacts will also be associated with the use of either SCR or $SCONO_X$. Both systems will require the disposal of spent catalyst materials, but the use of $SCONO_X$ will result in greater amounts of water consumption and the generation of substantial quantities of wastewater. $SCONO_X$ is capable of removing CO and VOC emissions, but control to a greater degree than DLN combustors has not been documented. The use of $SCONO_X$ will also result in emissions of regeneration gases and byproducts. With SCR, other impacts include the potential for accidental releases during the transportation and storage of ammonia, the SCR reagent. However, the potential for such impacts will be greatly reduced through the use of aqueous ammonia diluted to less than 20 percent ammonia concentration. The use of SCR will also result in higher emission rates of H_2SO_4 and ammonia sulfate particulate matter, but these emissions will be limited by the low sulfur content of natural gas and associated air quality impacts will be insignificant.

The proposed Project's NO_x impacts will be less than 50 percent of the allowable PSD increment at any location after application of DLN/LNB/SCR technology. In addition, modeling results indicate that the Project's ammonia emissions will produce a level of ammonia in ambient air that is less than the maximum level allowed under Ohio EPA's air toxics policy. Because the lowest NO_x emission rates and air quality impacts believed to be achievable by both $SCONO_x$ and DLN/LNB/SCR technology are the same, no environmental benefit would be associated with the purchase and operation of $SCONO_x$.

3.1.9. Determination of BACT for NO_X

As demonstrated by the review of recent BACT permit actions presented in the RBLC output the trend in NO_X control from combined-cycle systems has been the use of DLN burner technology in the CTGs, LNBs in the duct burners, and SCR for both. Application of this technology can be accomplished in a cost-effective manner at the Lawrence Energy Center, yielding calculated ambient NO_X concentrations that are roughly 20 percent of the PSD increment. The proposed emission level of 3.0 ppmvd, corrected to 15 percent O_2 based on a one-hour average, is therefore considered to meet BACT/BAT requirements for NO_X. The BACT emission limits for the auxiliary boiler and gas preheaters are based on the use of LNB.

3.2. BACT for Carbon Monoxide

3.2.1. Discussion Of Carbon Monoxide Control Options

CO is a product of incomplete combustion. CO formation is limited by ensuring complete and efficient combustion of the fuel in the combustion turbine and the duct burner. High combustion temperatures, adequate excess air, and good air/fuel mixing during combustion minimize CO emissions. Measures taken to minimize the formation of NO_X during combustion may inhibit complete combustion, which in turn could increase CO emissions. Lowering combustion temperatures through premixed fuel combustion can be counterproductive with regard to CO emissions; however, improved air/fuel mixing inherent in newer combustor designs and control systems limits the impact.

3.2.2. Review of CO BACT Database

The RBLC, Ohio BAT and other available databases described previously were screened to identify natural gas-fired combined-cycle CTGs for this BACT analysis. Peaking turbines, that normally have higher

emission limits, are not included in the BACT analysis. Table 4-8, submitted with the permit application, summarizes some of the projects in the database search that are pertinent to this BACT determination for the Project.

3.2.3. Identification of CO Control Options

The following control options were identified for controlling CO emissions from combustion sources:

- Oxidation catalyst
- $SCONO_X$
- Good Combustion Practices (GCP)

3.2.4 Technical Feasibility of CO Control Options

For reasons discussed in previous sections, $SCONO_X$ is considered technically infeasible. The two technically feasible CO control technologies are GCP and oxidation catalysts.

GCP is considered the baseline control technology for CO emissions. Calculation of emission reduction and costs for GCP are not presented because GCP is an integral part of the CTG and duct burner designs. Based on a review of the BACT information, 3 ppmvd is the lowest permitted or proposed limit for CO. Although an oxidation catalyst reduces CO, it also enhances the conversion of SO_2 from the natural gas to SO_3. This increases the amount of sulfuric acid mist, as the SO_3 reacts with water from the combustion gases. Likewise, the condensable particulate emissions increase because the SO_3 forms ammonium sulfate and bisulfate by reactions with the ammonia used in the SCR catalyst system for NO_X reduction.

3.2.5. Effectiveness of Technically Feasible CO Control Options

Most identified units are comparable in size to the proposed units. Many of the RBLC listed facilities utilize GCP, with some achieving levels comparable to those of facilities employing an oxidation catalyst.

3.2.6. Economic Evaluation of CO Control Options

Capital costs associated with oxidation catalysts were estimated using vendor quotations for similar projects. Capital costs and annualized costs were developed using the procedures presented in Ohio EPA's Guidance for Estimating Capital and Annual Costs of Air Pollution Control Systems (presented in Engineering Guide 46). The cost-effectiveness of the CO control system was calculated by dividing the total annual cost by the annual tons of pollutant removed. The $SCONO_x$ system was assumed to be able to achieve a CO control efficiency of 80 percent during normal power operations. An oxidation catalyst system was assumed to be able to achieve a CO control efficiency of between 50 and 80 percent during normal power operations.

Table 4-10, submitted with the permit application, presents the capital cost of an oxidation catalyst system. Table 4-11 in the permit application provides a summary of the total annualized cost and the cost-effectiveness of the oxidation catalyst system. CO emissions were calculated based on a total of 2,000 hours maximum CTG and duct burner firing with power augmentation in the winter (1,000 hours, Case 25T+DB) and summer (1,000 hours, Case 1T+DB) plus 6,240 hours of maximum CTG and duct burner firing during the remainder of the year (Case 12T+DB) plus 520 hours of CTG firing at 60 percent of maximum (Case 24T). Table 4-6 in the application provides the capital cost of a $SCONO_x$ system. Table 4-7 in the application provides a summary of the total annualized cost of the $SCONO_x$ system. Based on annualized cost, the oxidation catalyst system has a cost-effectiveness of between $1,378/ton (based on 1,570 tons of CO removed) and $2,204/ton (based on 981 tons of CO removed).

The cost-effectiveness of the $SCONO_x$ system (based on 1,570 tons removed) is $12,634/ton of CO removed.

3.2.7. Energy and Environmental Considerations

Application of either $SCONO_X$ or an oxidation catalyst system will produce an impact on the Project's energy efficiency. Installation of either system will increase the pressure drop in the turbine exhaust flow, which lowers power generation efficiency. Additional fuel must then be consumed to offset this lost power. Performance loss values of 0.2 and 0.8 percent for an oxidation catalyst system and $SCONO_x$, respectively, have been estimated for this Project. Tables 4-7 and 4-11, submitted with the permit application, itemize the annual energy impact of the two systems.

The use of a CO oxidation catalyst system will produce an increase in emissions of H_2SO_4 mist and PM. The system will also produce a waste catalyst that will require solid waste disposal.

3.2.8. Determination of BACT for CO

The inherently low CO emissions produced by the Project's CTGs and the use of GCP for this Project will result in low CO emissions. Although CO emissions can be further reduced through the use of a $SCONO_x$ system, this technology is unproven and not cost effective. An oxidation catalyst, however, can reduce CO emissions 50 to 80 percent during normal power production and is cost effective. Therefore, CO emission rates based on the following are BACT for the Project: application of GCP and an oxidation catalyst; 2.0 ppmvd CO at 15% oxygen when turbine load is at or above 75% without power augmentation, and without duct burners; 10 ppmv at 15% oxygen when turbine load is below 75%, or with power augmentation, or with duct burners firing. BACT CO emission limits for the auxiliary boiler and gas preheaters are based upon GCP.

3.3. BACT for Particulate

3.3.1. Discussion of PM_{10} Control Options

Combustion sources present four potential sources of PM_{10} emissions:

- mineral matter found in the fuel;
- solids or dust in the ambient air used for combustion;
- unburned carbon or soot formed by the incomplete combustion of the fuel; and
- condensable/secondary particulates formed as salts in the exhaust stream.

Natural gas contains no mineral matter, and therefore, the first potential source of PM_{10} emissions is not present during natural gas combustion. Furthermore, all combustion air passes through cartridge fabric filters to remove airborne PM to protect the rotating equipment in the combustion turbine, thus minimizing the second potential source of PM_{10} emissions. Therefore, the potential sources of PM_{10} are from unburned carbon and condensable particulates in the exhausts of the combustion turbines and duct burners.

Many PM emission limits include only the filterable PM_{10} that is measurable using USEPA Method 5. Results of a Method 5 test are commonly referred to as "front-half." When condensable PM must also be measured, a combination USEPA Method 5/202 must be employed. Method 202 collects the "back-half" or condensable, portion of the PM emissions. PM_{10} emission estimates for the Project's CTGs and duct burners include both front-half and back-half.

Emissions of PM_{10} from mechanical draft cooling towers result from solid material, both dissolved and suspended, in the cooling water. Particulates are emitted when small droplets of cooling water, called

drift, escape from the tower and evaporate. The dissolved and suspended materials in the drift become airborne particles when the water around them evaporates. PM_{10} emissions from mechanical draft cooling towers are usually estimated by using the design drift rate (in percent), the solids concentration in the cooling water in the basin of the tower (in ppm), and the cooling water circulation rate (in units of gallons per minute). PM_{10} emissions are reduced by using high efficiency mist eliminators and by controlling the dissolved solids level in the recirculating cooling water through periodic blowdowns.

Total suspended particulates (TSP) and particulate matter less than 10 micrometers (PM_{10}) will occur from the combustion of natural gas. The EPA's AP-42, Fifth Edition, Supplement B, Section 3, considers particulate matter from natural gas combustion to be less than 1 micron, so all emissions are considered as PM_{10}. The PM_{10} emissions from the combustion of natural gas will result primarily from inert solids contained in the unburned fuel hydrocarbons, which agglomerate to form particles. PM_{10} emission rates from natural gas combustion are inherently low because of very high combustion efficiencies and the clean burning nature of natural gas. Therefore, use of natural gas is in and of itself a highly efficient method of minimizing emissions. The maximum estimated PM_{10} emission rate is 0.01 lbs/MMbtu. Based on the EPA's RACT/BACT/LAER Clearinghouse (RBLC) database, there are no BACT precedents that have included an add-on TSP/PM_{10} control requirement for natural gas-fired combustion turbines. Therefore, BACT for PM_{10} emissions from the combustion turbines is proposed to be the use of a low ash fuel and efficient combustion. This BACT choice will meet any reasonable opacity standard. Typically, plume opacity is not an issue for this type of facility as the exhaust plumes are nearly invisible except for the condensation of moisture during periods of low ambient temperature.

3.3.2. Review of PM_{10} BACT Database

The RBLC and Ohio BAT databases were screened to identify combined-cycle CTGs for this BACT analysis. All combined-cycle systems were reported to use combustion controls to achieve BACT for the turbines/duct burners. Table 4-12, submitted with the permit application, summarizes the projects in the database search that are pertinent to the BACT determination for the mechanical draft cooling towers. Drift eliminators were used for BACT for all the mechanical draft cooling towers found in the search.

3.3.3. Identification of PM_{10} Control Options

The following control options were identified for controlling PM_{10} emissions from combustion sources:

- Add-on control technologies such as electrostatic precipitators, fabric filters, or scrubbers
- Use of clean fuels such as natural gas
- Combustion controls to minimize the formation of soot

The following control options were identified for controlling PM_{10} emissions from mechanical draft cooling towers:

- Drift eliminators
- Air cooling

3.3.4. Technical Feasibility of PM_{10} Control Options

Add-on Control Systems for Combustion Systems

No known applications exist where add-on control systems are used for controlling PM_{10} from natural gas-fired boilers or CTGs. Combustion systems employing add-on PM controls are those fired with solid fuels and/or residual oil, which contain relatively high levels of mineral matter. Therefore, add-on controls are not considered to be technically feasible for controlling PM or PM_{10} emissions from CTGs or duct burners firing natural gas.

Combustion Controls

The proposed CTGs will be equipped with state-of-the-art combustion controls to ensure maximum efficiency. As a result, the conversion of fuel carbon to CO_2 will be maximized, and the production of carbonaceous soot particulates minimized. Therefore, CTGs and duct burners firing clean natural gas with state-of-the-art combustors and an emission rate of 0.0122 lb/MMBtu (CTG only) or 0.0112 lb/MMBtu (CTG plus duct burner) front-half/back-half is BACT for PM_{10}.

Cooling Tower Drift Eliminator

Emissions of PM_{10} from mechanical draft cooling towers are caused by dissolved solids within the water droplets (drift) that escape the tower. For a given solids concentration (defined by the cooling water source and tower design and operating specifications), particulate emissions from the cooling towers depend on the amount of water that drifts from the tower. The amount of drift from evaporative cooling towers, usually expressed as a percent of circulating water flow, is called total liquid drift. Drift eliminators are installed in the cooling tower cells to reduce total liquid drift. Drift eliminators work by passing the cooling tower exhaust through mesh type media resulting in the inertial separation of the water droplets from the air stream. Solids content varies widely depending upon the cooling water source (in this case, potable water). For typical mechanical draft cooling towers, drift specifications range from 0.0005 to 0.1 percent of the total liquid flow. Based on the water source, the total particulate emissions from all combined cells of the cooling tower will not exceed 1.69 pounds per hour (lb/hr).

Air-Cooled Condensers

Air-cooled heat exchangers are an alternate method of condensing steam from a steam turbine. Air passes through coils with metal fins and condenses the steam. Because air cooling requires no cooling water or cooling tower, the PM emissions produced by liquid drift are eliminated. However, an air-cooled system requires significantly more space than a mechanical draft cooling tower. Air cooling is only used where water is not available, and is therefore considered technically infeasible for the proposed Project, which will have abundant water supplies. Air-cooled heat exchangers would add significant cost to the Project and be less efficient than mechanical draft cooling towers.

3.3.5. Determination of BACT for PM_{10}

Combustion Units

As in all existing permitted combined-cycle plants, BACT for the CTGs and duct burners is based on the use of combustion controls to minimize soot formation. Use of these controls yields PM_{10} BACT limits of 0.0118 lb/MMBtu and 0.0168 lb/MMBtu, combined filterable and condensable, for the CTGs and duct burners, respectively, and 0.0123 lb/MMBtu for combined CTG and duct burner firing. No other technically feasible control options exist, and therefore, cost-effectiveness is not calculated for this option. The BACT emission limits for the Project's other miscellaneous combustion units are based on the use of combustion controls and limited operating hours.

Cooling Towers

Mechanical draft cooling towers are routinely equipped with drift eliminators to minimize losses. BACT for the Project's cooling towers will consist of control of the solids content in the recirculating cooling water and use of high-efficiency drift eliminators to minimize the drift to 0.0005 percent. This will reduce PM_{10} emission to 1.69 lb/hr for all cells combined.

3.4. BACT for Volatile Organic Compounds

3.4.1. Discussion of VOC Control Options

VOC emissions from natural gas-fired combustion sources are the result of incomplete combustion of natural gas and recombination of the products of incomplete combustion. Complete combustion is a function of time, temperature, and turbulence. Once the combustion process begins, adequate time at the required combustion temperature must be provided to complete the combustion process. Turbulence or mixing must also be maintained during combustion to ensure that the fuel has adequate oxygen from the combustion air. Combustion systems with poor control of the air-to-fuel ratio, poor mixing, and/or insufficient time at combustion temperatures will produce higher VOC emissions than those with good controls. The combustion controls proposed for the Project are state-of-the-art and designed to achieve high combustion efficiencies.

3.4.2. Review of VOC BACT Database

The RBLC and the Ohio BAT database were screened to identify combined-cycle CTGs for this BACT analysis. Table 4-13, submitted with the permit application, summarizes the projects in the database search that are pertinent to this BACT determination for the Project. The review shows only one system has been permitted (in 1992) with an oxidation catalyst system as BACT for VOC control. The review also shows that more recent permits have required similar VOC emission rate limits without an oxidation catalyst control system.

3.4.3. Identification of VOC Control Options

The following control options were identified for controlling VOC emissions from combustion sources:

- Oxidation catalyst
- Thermal oxidation
- $SCONO_X$
- GCP

Almost all of the recent permits listed in the RLBC database indicate that good combustion practices/design is the preferred method of VOC control on combined cycle combustion turbines. The maximum estimated unburned hydrocarbons emissions concentration is 2.73 ppmvw at 15 percent oxygen from the CTG. The VOC emission concentration will be less than the unburned hydrocarbon concentrations. The slight difference in concentration is due to the differences inherent in the combustion sources. There are no expected adverse economic, environmental, or energy impacts associated with good combustion practices/design. Thus, good combustion practices/design is proposed as BACT for control of VOC emissions for the combustion turbines.

3.4.4. Technical Feasibility of VOC Control Options

Catalytic oxidation of VOC is a technically proven control alternative for combustion turbines; however, it has primarily been used to meet specialized requirements such as LAER, typically in areas that are designated as non-attainment for ozone. Catalytic oxidation can achieve a VOC reduction efficiency of 80 percent with VOC compounds larger than ethane. Since natural gas is comprised of over 92 percent methane, a significantly smaller compound than ethane, the reduction efficiency by this technology when firing natural gas is exaggerated. Good combustion practices include proper air-to-fuel ratio and design that adequately accounts for time, temperature, and turbulence conditions within the combustion zone.

Thermal oxidation is considered technically infeasible because of the need to handle extremely large volumes of exhaust gas and raise its temperature to above 1,300^{O}F, the typical minimum operating temperature of a thermal oxidizer. Therefore, no additional reduction of VOCs with increased temperature can be accomplished. SCONO$_X$ is considered technically infeasible for the same reasons as presented in the NOx BACT section. The remaining options listed above (oxidation catalyst and GCP) are considered technically feasible. Capital and annualized costs of GCP controls are not provided because controls for GCP are integral to the CTG and duct burner designs.

3.4.5. Effectiveness of Technically Feasible VOC Control Options

SCONO$_x$ is not expected to achieve more than a 50 percent reduction of VOC emissions. Based on the expected design of the HRSG, an oxidation catalyst is expected to achieve an overall VOC control efficiency of approximately 25 percent. The actual VOC control efficiency will depend both on the uncontrolled emissions from the Project's CTGs and duct burners, and the performance of the oxidation catalyst. Actual VOC emission rates will be measured after the Project is operational.

3.4.6. Economic Evaluation of VOC Control Options

Tables 4-6 and 4-7, submitted with the permit application, provide a summary of the capital and annualized costs respectively, associated with the use of a SCONO$_x$ system. Tables 4-10 and 4-11 from the permit application, provide a summary of the capital and annualized costs, respectively, associated with the use of an oxidation catalyst system. VOC emissions were calculated based on the same combination of operating scenarios as CO emissions, as described in Section 3.2.6. A SCONO$_x$ system and an oxidation catalyst were assumed to be able to achieve VOC control efficiencies of 50 percent and 25 percent, respectively. Based on these numbers and 129 tons and 64.5 tons of VOC removed per year by SCONO$_x$ and an oxidation catalyst, respectively, the cost-effectiveness of a SCONO$_x$ system for VOC control is $153,878/ton removed, and the cost-effectiveness of an oxidation catalyst system for VOC control is $33,549/ton removed. Neither of these systems, therefore, can be considered economically feasible. Nevertheless, an oxidation catalyst is economically feasible for CO control, and provides a measure of VOC control as an additional benefit.

3.4.7. Determination of BACT for VOC Control

Combustion controls and an oxidation catalyst are considered BACT for VOC control for the Lawrence Energy Center. Based on review of the units listed in Table 4-13, submitted with the permit application, emission limits of 0.00231 lb/MMBtu at 75 to 100 percent load and 0.00302 lb/MMBtu at less than 75 percent load are BACT for VOC for the CTGs. Emission limits of 0.0375 lb/MMBtu (with PAG) and 0.015 lb/MMBtu (without PAG) are BACT for VOC for the duct burners. Emission limits of 0.0105 lb/MMBtu (with PAG) and 0.00517 lb/MMBtu (without PAG) are BACT for VOC for the CTG and duct burners combined.

BACT for VOC for the auxiliary boiler and gas preheaters is achieved by good combustion controls.

3.5. BACT for Sulfur Dioxide and Sulfuric Acid

3.5.1. Source of SO_2 and H_2SO_4 emissions

Sulfur dioxide emissions from CTGs and duct burners are produced by sulfur in the fuel. Sulfuric acid is also produced when SO_2 is converted to SO_3, which is then further combined with water to form H_2SO_4 , and ammonia will form ammonium sulfate salts. Although the Project will only use low-sulfur pipeline-quality natural gas, the fuel still contains small quantities of sulfur. During the combustion process, most of the sulfur is converted to SO_2. Fifteen percent of the SO_2 is assumed to be converted to SO_3 and eventually to H_2SO_4 and/or ammonium sulfate salts.

3.5.2. Review of SO2 and H2SO4 BACT Database

The RBLC and Ohio BAT were screened to identify combined-cycle CTGs for this BACT analysis. This information yielded only one option for SO_2 control. For all units where SO_2 control was discussed, the only option considered was the combustion of low-sulfur pipeline-quality natural gas. No other controls have been implemented on a gas-fired turbine or boiler. No information was found for H_2SO_4 control.

3.5.3. Identification of Sulfur Control Options

The control technologies available for controlling SO_2 and H_2SO_4 emissions from combustion turbines and duct burners include the following:

- Flue gas desulfurization
- Combustion of low sulfur fuel

No control technology was identified to abate H_2SO_4 emissions from natural gas combustion.

3.5.4. Technical Feasibility of Sulfur Control Options

Flue gas desulfurization (FGD) uses an alkali solution such as caustic or lime slurry in a scrubber to remove sulfur compounds from the flue gases of combustion sources. FGD systems are common on coal-fired boilers where the fuel has significant sulfur content. The cost of using FGD for gas-fired units, however, would be prohibitive for the small quantity of SO_2 and/or H_2SO_4 removed. Also, the low concentration of SO_2 and H_2SO_4 in the exhaust gas would hamper effective removal efficiency. Add-on SO_2 and H_2SO_4 control technologies have never been considered BACT for combustion turbines. Use of a low-sulfur fuel, such as natural gas, is generally considered the only feasible option for SO_2 and H_2SO_4 control for combined-cycle projects.

3.5.5. Determination of BACT for Sulfur

The use of low-sulfur fuel is considered BACT/BAT for SO_2 and H_2SO_4 from the proposed combustion sources. Use of natural gas with a sulfur content of 2 gr/100 scf yields a BACT SO_2 emission rate of 0.0057 lb/MMBtu from the CTGs, duct burners, auxiliary boiler, and gas preheaters. Use of low sulfur diesel fuel with a sulfur content of 0.05 percent yields a BACT SO_2 emission rate of 0.051 lb/MMBtu from the emergency diesel generator and diesel fire water pump.

Control techniques available to reduce SO_2 emissions include flue gas desulfurization (FGD) systems and the use of low sulfur fuels. A review of the RLBC indicates that while FGD systems are common on boiler applications, they are not common with boilers firing very low sulfur fuels, such as natural gas. FGD systems are not cost effective because the SO_2 emissions are already minimal. The estimated SO_2 emission rate is 0.006 lbs/MMBTU. Thus, the use of an FGD system is rejected as a BACT control alternative.

The BACT control alternatives for H_2SO_4 are the same as for SO_2. An H_2SO_4 emission limit of 0.001 lbs/MMBTU based on low sulfur fuel is proposed as BACT for H_2SO_4. Therefore, the use of natural gas is proposed as BACT for the auxiliary boiler.

3.6. Toxic Air Pollutants

3.6.1. Discussion of Control Options for Toxic Air Pollutants

Ohio EPA new source permitting procedures require that BAT be employed for all air pollutants released from the proposed source. Because BACT and BAT are somewhat similar, the BACT determination discussed above will satisfy these BAT requirements. Several additional air pollutants will be emitted from the proposed facility that are not required to undergo a BACT evaluation but do require the application of BAT. These pollutants are acetaldehyde, ammonia, ethylbenzene, formaldehyde, propylene oxide, toluene, and xylenes.

The Ohio EPA BAT database was searched for determinations for acetaldehyde, ammonia, ethylbenzene, formaldehyde, propylene oxide, toluene, and xylenes as they relate to the Project. No determinations were identified for these emissions produced from natural gas combustion sources operated to generate electricity or steam. Therefore, BAT for this Project is considered to be achieving the acetaldehyde, ammonia, ethylbenzene, formaldehyde, propylene oxide, toluene, and xylenes emission rates specified in the permit. Project emissions of these pollutants will produce ambient air impacts below all applicable threshold levels.

3.7. Summary of BACT and BAT Determinations

Tables 4-14 and 4-15, submitted with the permit application, present summaries of the BACT and BAT evaluations, respectively, for the Lawrence Energy Center. These emission rates are not applicable to periods of start-up, shutdown, and malfunction. Lawrence Energy requests instead that the following conditions apply during these periods:

a. Proper operating procedures will be followed to minimize emissions during start-up, shutdown, and malfunction.

b. With an SCR system malfunction, the NO_x limit will be 25 ppmvd. If the SCR system cannot be repaired, the combustion system will be shut down as soon as practicable provided the shutdown would not endanger the regional electrical power system.

4. BACT for Other Equipment

4.1. AUXILIARY BOILER

One natural gas-fired boiler will be installed to provide an alternate source of steam for facility heating and soft starting the combustion turbine systems. The auxiliary boiler has a rated heat input of 99 million BTUs per hour. The auxiliary boiler will fire a maximum of 3,500 hours per year and will vent through a separate stack.

Nitrogen Oxides (NO_X):

The boiler design will incorporate Low NO_X burners for NO_X control, which is common for auxiliary boilers. Due to the intermittent use of this boiler, the use of Low NO_X burners and natural gas as the sole fuel is proposed as BACT for NO_X control of the auxiliary boiler. The estimated NOx emissions rate is 0.05 lb/MMBTU.

Carbon Monoxide (CO):

The control technologies evaluated for use on the natural gas-fired auxiliary boiler include proper boiler design/good operating practices. The cost of add-on controls on intermittently operated facilities is prohibitive. However, controlling boiler-operating conditions can minimize carbon monoxide emissions. This includes proper burner settings, maintenance of burner parts, and sufficient air, residence time, and mixing, for complete combustion. The maximum estimated CO emission rate is 0.084 lb/MMBTU. Thus, boiler design and good operating practices are proposed as BACT for controlling the CO emissions from the auxiliary boiler.

Sulfur Dioxide (SO_2) and Sulfuric Acid ($H_2 SO_4$) Mist:

The BACT control alternatives for H_2SO_4 are the same as for SO_2. The estimated SO_2 emission rate is 0.0006 lbs/MMBTU. The use of natural gas is proposed as BACT for the auxiliary boiler.

Volatile Organic Compounds (VOC):

Good boiler design and good operating practices are proposed as BACT for controlling VOC emissions from the auxiliary boiler. The maximum estimated VOC emission rate is 0.0055 lbs/MMBTU.

Total Suspended Particulates/PM_{10}:

The use of natural gas is the BACT for TSP/PM_{10}. The maximum estimated TSP/PM_{10} emission rate is 0.0076 lbs/MMBTU.

4.2. EMERGENCY DIESEL GENERATOR

One emergency diesel generator will supply power to the turbine's auxiliaries in the event that an emergency shut down of the unit is required or there is a power outage. The emergency diesel generator is rated at 1000 kW. The emergency diesel generator will have a rated heat input of 10.04 million BTUs per hour. The annual operating time is estimated to be less than 500 hours. Due to the very low operating hours of these units, good combustion control and engine design and use of low sulfur fuel (0.05%) are proposed as BACT.

4.3. DIESEL FIRE SERVICE WATER PUMP

The diesel fire pump will supply water to the fire protection system. The fire protection system provides fire suppression and elimination to the entire facility. The diesel fire pump will have a rated heat input of 2.75 million BTUs per hour. The diesel fire pump's estimated annual operation will be less than 500 hours and typically only 30 minutes of test firing per week. Proper engine design, low operating hours, and use of low sulfur fuel (0.05%) is proposed as BACT for emissions from the diesel fire pump.

4.4. COOLING TOWERS

The cooling tower will be multi-celled, mechanical draft, counterflow type with an associated liquid drift.

This drift is a source of particulate emission, caused by dissolved and suspended solids inherently contained within the liquid droplets. The water droplets then will evaporate allowing the particulates to agglomerate. The particle sizes are mostly in the 20 to 30 micron range, according to a 1984 EPRI report titled "User's Manual: Cooling-Tower-Plume Prediction Code", Section 4, Pg. 4-1. The annual operating time is expected to be 8,760 hours. The BACT determination for particulates is discussed below.

There are no technically feasible alternatives that can be installed on the cooling towers, which specifically reduce particulate emissions; however, cooling towers are typically designed with drift elimination features. The drift eliminators are specially designed baffles that collect and remove condensed water droplets in the air stream. These drift eliminators, according to a review of the EPA's RBLC, can reduce drift to 0.0015 percent to 0.004 percent of cooling water flow, which reduces particulate emissions. Therefore the use of drift eliminators to attain an emission rate of 1.69 lbs/hr is proposed as BACT for cooling tower particulate emissions.

4.5. NATURAL GAS-FIRED FUEL PREHEATERS

Two natural gas-fired fuel preheaters will be installed. The fuel preheaters will have a rated heat input of 6 million BTUs per hour each. The fuel preheaters will fire a maximum of 8,760 hours per year and will vent through a separate stack. The use of natural gas, proper design and good operating practices is proposed as BACT for the preheaters. This includes proper heat settings, maintenance of preheater parts, and sufficient air, residence time, and mixing for complete combustion.

4.6. SPACE HEATERS

Twenty natural gas space heaters will be installed for heating the facility. The use of natural gas, proper design and good operating practices is proposed as BACT for the heaters.

5.0 MODELING

5.1. Site Description/Air Quality Designations

The Lawrence Energy Center LLC installation is located in Air Quality Control Region (AQCR) 103. The area is attainment or attainment/unclassifiable for particulate matter less than 10 microns, sulfur dioxide, nitrogen oxides, carbon monoxide, volatile organic compounds (ozone) and lead.

5.2. Modeling

Air quality dispersion modeling was conducted to assess the effect of these sources on the national ambient air quality standards and the PSD increments. The U.S. EPA Industrial Source Complex-Short Term (ISCST3, Version 00101) model was used for the refined modeling in the simple terrain portion of the analysis (terrain below stack tip). Since there is no on-site meteorological data for this complex terrain analysis, CTSCREEN (Version 93228) was used to determine ambient impacts on the terrain above stack tip. The purpose of the refined modeling was to demonstrate that the project did not cause or significantly contribute to violations of the NAAQS or the PSD increments.

The ISCST3, and CTSCREEN models were the appropriate models for this analysis, based on the need to model simple and complex terrain, 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 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 the nearby building dimensions. CTSCREEN was run with internal meteorological data in both stable and unstable modes.

Building wake effects will influence emissions from stacks with heights less than Good Engineering Practice (GEP). The ISCST3 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 does not include building downwash effects.

The ISCST3 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 web page. Following OEPA modeling guidance concerning representative meteorological data for various counties, the Huntington surface, Huntington upper air (1987-1991) PCRAMMET data were used in the refined modeling analysis.

5.3. Modeling Results/Increment Analysis

Modeling at 100%, 85%, 75% and 60% loads, for natural gas, and using worst case stack parameters based on five ambient temperatures , was performed to determine the worst case impacts for each pollutant. The two worst case scenarios were carried through to the PSD and NAAQS analyses. The maximum predicted project impacts for NO2, SO2 and PM10 exceeded the PSD significant impact thresholds. Therefore, additional dispersion modeling was necessary to determine that the project would not cause or significantly contribute to violations of the NAAQS or PSD increments.

The maximum predicted 1-hour and 8-hour CO concentration of 957 ug/m3 and 353 ug/m^3 respectively were below the corresponding significant impact increments of 2000 and 500 ug/m^3. Therefore, no additional dispersion modeling analysis were necessary for CO.

Increment

All areas surrounding the Lawrence Energy Center LLC facility are Class II PSD areas. It is the Ohio EPA policy that no individual project consumes more than 50% of the available PSD increment. If more than 50% of the available increment is consumed, it should be demonstrated that the only potential constraint on future growth in the region would be on the applicant. For CO and Pb, projects are constrained to no more than 25% of the NAAQS. The following is the summary of the impact of increment consuming sources:

Pollutant	Averaging Period	Project Impact	Total PSD Impact	PSD Increment Concentration
PM10	24-hour	24.8 ug/m3	24.8 ug/m3	30 ug/m3
	Annual	4.97 ug/m3	4.97 ug/m3	17 ug/m3
SO2	3-hour	69.1 ug/m3	69.1 ug/m3	512 ug/m3
	24-hour	14.8 ug/m3	14.8 ug/m3	91 ug/m3
	Annual	2.96 ug/m3	2.96 ug/m3	20 ug/m3
NOx	Annual	7.30 ug/m3	7.61 ug/m3	25 ug/m3

Due to the level of projected impacts, especially 24-hour PM10, Ohio EPA also required that the Lawrence Energy Center LLC facility perform additional modeling using AERMOD, the proposed replacement for ISCST3, to assure that future growth would be possible. Peak 24-hor PM10 AERMOD impacts were less than 10 ug/m3. Ohio EPA believes that future modeled impacts would allow for additional growth in the region, including Kentucky.

NAAQS

Existing sources at the facility, existing sources above the PSD significant rates within the Lawrence Energy Center LLC facility significant impact area (SIA) and sources greater than 100 tons/year outside of the SIA are modeled to determine the combined impact of existing significant sources. A background value was added to account for minor sources not explicitly included in the modeling.

Pollutant	Averaging Period	Predicted* Concentration	Concentration With Background	NAAQS Concentration
PM10	24-hour	24.6 ug/m3	72.6 ug/m3	150 ug/m3
	Annual	4.91 ug/m3	30.9 ug/m3	50 ug/m3
SO2	3-hour	543ug/m3	724 ug/m3	1300 ug/m3
	24-hour	175 ug/m3	243 ug/m3	365 ug/m3
	Annual	30.1 ug/m3	43.1 ug/m3	80 ug/m3
NOx	Annual	11.6 ug/m3	49.6 ug/m3	100 ug/m3

* Based on revised modeling using revised emission rates and source configurations to reduce PM10 24-hour impacts below 25 ug/m3.

5.4. Monitoring Requirements

U.S. EPA regulations may require a year of ambient air quality data to be obtained as part of the PSD application if representative ambient data do not exist. An applicant may conduct model to demonstrate a “de minimus” impact, indicating that monitoring will not be necessary. 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, Ohio EPA has provided ambient data to Lawrence Energy Center LLC facility which it believes are conservative and representative of existing air quality. Therefore, no preconstruction monitoring is required.

5.5. Additional Impact Analysis

The closest Class I area to the Lawrence Energy Center LLC installation is more than 200 km distance from the proposed site and, therefore, no specific analysis of potential impacts was required . 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 Lawrence Energy Center LLC installation is located greater than 100 kilometers from any Class I area, the Lawrence Energy Center LLC installation was not subject to 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. The results demonstrate maximum concentrations are well below sensitive levels.

The project is to employ 30 permanent positions during operations. It is not expected that there will be regional population, commercial, or industrial growth associated with this project.

Conclusions

Based upon analysis of the permit to install application and it's supporting documentation provided by Lawrence Energy Center LLC, the Ohio EPA staff has determined that the proposed increase will comply with all applicable State and Federal environmental regulations and that the requirements for BACT are satisfied. Therefore, the Ohio EPA staff recommends that a permit to install be issued to Lawrence Energy Center LLC.

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RE: DRAFT PERMIT TO INSTALL
LAWRENCE COUNTY
Application No: 07-00505

CERTIFIED MAIL

Y	TOXIC REVIEW
Y	PSD
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Y	MODELING SUBMITTED
	GASOLINE DISPENSING FACILITY

DATE: 9/24/2002

Lawrence Energy Center
Mark Chrisos
Calpine Lewis Wharf
Boston, MA 02110

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 of 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 **$1200** 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

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

CC: **USEPA** **PCHD** **KY** **WV**
Alan Lloyd **OEPA/Central Office/DAPC**

DRAFT PERMIT TO INSTALL 07-00505

Application Number: 07-00505

APS Premise Number: 0744000151

Permit Fee: **To be entered upon final issuance**

Name of Facility: Lawrence Energy Center

Person to Contact: Mark Chrisos

Address: Calpine Lewis Wharf
Boston, MA 02110

Location of proposed air contaminant source(s) [emissions unit(s)]:
US Rte 52
Hanging Rock, Ohio

Description of proposed emissions unit(s):
1100 MW combined cycle power plant consisting of three 180 MW Westinghouse 501F natural gas fired combustion turbines, three heat recovery steam generators (HRSGs) with duct burners.

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.10 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 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 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 thirty (30) 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.

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 Related to Monitoring and Recordkeeping Requirements

The permittee shall submit required reports in the following manner:

a. Reports of any required monitoring and/or recordkeeping 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 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 application must be made to the Director for the installation or modification of any other emissions unit(s).

8. Construction Compliance Certification

The applicant shall provide Ohio EPA with a written certification (see enclosed form) that the 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 <u>Federally Enforceable</u> 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

Pollutant	Tons Per Year
NOx	**577.9**
CO	**1618.1**
SO2	**213.4**
PE/PM_{10}	**342.4**
VOC	**448.5**
Ammonia	**495.3**
Formaldehyde	**13.41**
Sulfuric acid	**48.6**

Part II - FACILITY SPECIFIC TERMS AND CONDITIONS

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

1. PSD REQUIREMENTS

The source described in this Permit to Install is subject to the applicable provisions of the Prevention of Significant Deterioration (PSD) regulations as promulgated by the United States Environmental Protection Agency 40 CFR 52.21. The authority to apply and enforce the PSD regulations has been delegated to the Ohio Environmental Protection Agency. The terms and conditions of this permit and the requirements of the PSD regulations are also enforceable by the United States Environmental Protection Agency.

In accordance with 40 CFR 124.15, 124.19 and 124.20, the following shall apply: (1) the effective date of this permit shall be 30 days after the service of notice to any public commentors of the final decision to issue, modify, or revoke and re-issue the permit, unless the service notice is by mail, in which case the effective date of the permit shall be 30 days after the service of notice; and (2) if an appeal is made to the Environmental Protection Agency, the effective date of the permit is suspended until such time as the appeal is resolved or denied.

Appeals will be addressed to:

United States Environmental Protection Agency
Environmental Appeals Board
401 M. Street, SW (MC-113do)
Washington, DC 20460

2. The following emissions units (EU) are also being installed as part of this project and their potential to emit (PTE) and other De Minimis or non-permitted sources located at the facility shall be included in emission calculations to demonstrate compliance with federal limits and regulations.

EU	BACT	Emissions
1000 kW diesel fired use of emergency generator*	low sulfur fuel	8.1 TPY NOx 6.4 TPY CO 0.62 TPY VOC 0.13 TPY SO2 0.25 TPY PE/PM_{10}
(1) diesel fired fire water pump*	use of low sulfur fuel	3.1 TPY NOx 2.0 TPY CO 0.75 TPY VOC 0.04 TPY SO2 0.21 TPY PE/PM_{10}
(2) natural gas fired	use of	1.3 TPY NOx

gas preheaters	natural gas	2.2 TPY CO 0.15 TPY VOC 0.16 TPY SO2 0.20 TPY PE/PM_{10}
(20) natural gas fired space heaters	use of natural gas	8.28 TPY NOx 3.50 TPY CO 0.48 TPY VOC 0.53 TPY SO2 0.66 TPY PE/PM_{10}

***** subject to OAC rule 3745-31-03(A)(4), restricted to no more than 500 hours per 12 month rolling period.

3. The emissions of Hazardous Air Pollutants (HAPs), as defined in Section 112(b) of the Clean Air Act, from all emissions units located at this facility combined, shall not exceed 10 tons per year for an individual HAP and 25 tons per year for any combination of HAPs, per rolling 12 month period. Potential HAP emissions are below 10 TPY for any single HAP (not including duct burners) and 25 TPY for combination of HAPs, therefore 112(g) does not apply to this facility. USEPA has determined that case-by-case MACT determinations under 40 CFR Part 63, subpart B do not apply to duct burners which are part of combined cycle systems because of the duct burners being considered an electric utility steam generating unit. [Federal Register. 40 CFR Part 63, May 25, 2000]

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

1. The permit to install was evaluated based on the actual materials and the design parameters of the emission unit's exhaust system, as specified by the permittee in the permit to install application. The OEPA's "Review of New Sources of Air Toxic Emissions" policy ("Air Toxic Policy") was applied for each pollutant emitted by the emission unit using data from the permit to install application and the SCREEN 3.0 model (or other Ohio EPA approved model). The predicted 1-hour maximum ground-level concentration from the use of the SCREEN 3.0 model was compared to the maximum Acceptable Ground-Level Concentration (MAGLC). The following summarizes the results of the modeling:

Pollutant: Formaldehyde
TLV (ug/m3): 272 (converted from STEL)
Maximum Hourly Emission Rate (lb/hr): 3.07*
Predicted 1-Hour Maximum Ground-Level Concentration (ug/m3): 6.25
MAGLC (ug/m3): 6.48

Pollutant: Sulfuric Acid
TLV (ug/m3): 1000

Maximum Hourly Emission Rate (lb/hr): 11.35*
Predicted 1-Hour Maximum Ground-Level Concentration (ug/m3): 23.1
MAGLC (ug/m3): 23.8

Pollutant: Ammonia
TLV (ug/m3): 17,413
Maximum Hourly Emission Rate (lb/hr): 112.7*
Predicted 1-Hour Maximum Ground-Level Concentration (ug/m3): 219
MAGLC (ug/m3): 414.6

Pollutant: Toluene
TLV (ug/m3): 188,405
Maximum Hourly Emission Rate (lb/hr): 1.11*
Predicted 1-Hour Maximum Ground-Level Concentration (ug/m3): 2.26
MAGLC (ug/m3): 4,486

Pollutant: Xylene
TLV (ug/m3): 434,192
Maximum Hourly Emission Rate (lb/hr): 0.55*
Predicted 1-Hour Maximum Ground-Level Concentration (ug/m3): 1.11
MAGLC (ug/m3): 10,338

Pollutant: Acetaldehyde
TLV (ug/m3): 33,195
Maximum Hourly Emission Rate (lb/hr): 0.341*
Predicted 1-Hour Maximum Ground-Level Concentration (ug/m3): 0.690
MAGLC (ug/m3): 790

Pollutant: Ethyl Benzene
TLV (ug/m3): 434,192
Maximum Hourly Emission Rate (lb/hr): 0.27*
Predicted 1-Hour Maximum Ground-Level Concentration (ug/m3): 0.530
MAGLC (ug/m3): 10,338

Pollutant: Propylene Oxide
TLV (ug/m3): 4,751
Maximum Hourly Emission Rate (lb/hr): 0.25*
Predicted 1-Hour Maximum Ground-Level Concentration (ug/m3): 0.500
MAGLC (ug/m3): 113

* This was modeled for emissions units B001, P001, P002, and P003 combined.

2. Physical 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, 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 specified in the above table;

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.).

3. If the permittee determines that the "Air Toxic Policy" will be satisfied for the above changes, the 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 show the results of the application of the "Air Toxic Policy" for the change

4. In order to reduce the maximum predicted 24-hour average PM_{10} modeled impacts to less than 25 ug/m3, the maximum daily operating hours of the equipment listed below shall not exceed the following, when all three combustion turbines are in operation:

   emergency generator: 4 hours
   fire water pump 1 hour
   auxiliary boiler 1 hour

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.

Operations, Property, and/or Equipment	Applicable Rules/Requirements	Applicable Emissions Limitations/Control Measures
B001 - 99 MMBtu/hr natural gas fired auxiliary boiler	40 CFR 52.21 and OAC rule 3745-31-(10) thru (20)	Nitrogen oxide (NOx) emissions shall not exceed: 0.05 lb/MMBtu actual heat input and 4.95 lbs/hr. Sulfur dioxide (SO2) emissions shall not exceed: 0.0057 lb/MMBtu actual heat input and 0.56 lb/hr. Carbon monoxide (CO) emission shall not exceed: 0.084 lb/MMBtu actual heat input and 8.32 lbs/hr. Volatile organic compounds (VOC) emissions shall not exceed: 0.0055 lb/MMBtu actual heat input and 0.545 lb/hr. Particulate(PE/PM_{10}) emissions shall not exceed: 0.0076 lb/MMBtu actual heat input and 0.76 lb/hr. NOx emissions shall not exceed 8.7 tons, per rolling 12 months. SO2 emissions shall not exceed 1.0 tons, per rolling 12 months.

	PE/PM_{10} emissions shall not exceed 1.3 tons, per rolling 12 months. CO emissions shall not exceed 14.6 tons, per rolling 12 months. VOC emissions shall not exceed 1.0 tons, per rolling 12 months. See Section A.I.2.b below.
OAC rule 3745-31-05(A)(3)	The requirements of this rule also includes compliance with the requirements of 40 CFR 60 Subpart Dc, OAC rule 3745-18-06(A), OAC rule 3745-17-10(B)(1), OAC rule 3745-17-07(A), 40 CFR 52.21, and OAC rule 3745-31-(10) thru (20).
OAC rule 3745-17-07(A)	Visible particulate emissions shall not exceed 20 percent opacity, as a six-minute average.
OAC rule 3745-17-10(B)(1)	see Section A.I.2.a below.
OAC rule 3745-18-06(A)	see Section A.I.2.a below.
40 CFR 60 Subpart Dc	see Section A.III.6 below.
OAC rule 3745-31-05(D)	see Sections A.I.2.c and A.II.2. below.

2. Additional Terms and Conditions

2.a The requirements of this rule are less stringent than the requirements of 40 CFR 52.21 and OAC rule 3745-31-(10) thru (20) and/or 3745-31-05(A)(3).

2.b Based on the "Prevention of Significant Deterioration" (PSD) analysis conducted to ensure the application of "Best Available Control Technology" (BACT), it has been determined that the use of natural gas, low sulfur fuel and low NOx burners constitutes BACT for this emission unit. The emissions limits based on the BACT requirements are listed under 40 CFR 52.21 and OAC rule 3745-31-(10) thru (20) above.

2.c The requirements of this rule are equivalent to the NOx, SO2, and PE/PM_{10} emissions per 40 CFR Part 52.21 and OAC rule 3745-31 (10) through (20).

II. Operational Restrictions

1. The permittee shall burn only natural gas in this emission unit. The maximum sulfur content of the natural gas shall not exceed 2 grains per 100 standard cubic feet.

2. The maximum daily operating hours for this emissions unit shall not exceed 1, when all three combustion turbines are operating.

3. The maximum annual hours of operation of this emissions unit shall not exceed 3500, based upon a rolling, 12-month summation.

To ensure enforceability during the first 12 calendar months of operation following the startup of this emissions unit, the permittee shall not exceed the monthly hours of operation restrictions specified in the following table:

Month	Maximum Annual Cumulative Hours of Operation
1	292
1-2	583
1-3	875
1-4	1167
1-5	1458
1-6	1750
1-7	2042
1-8	2333
1-9	2625
1-10	2917
1-11	3208
1-12	3500

After the first 12 calendar months of operation of this emission unit, compliance with the annual operating hours limitation shall be based upon a rolling, 12-month summation of the operating hours.

III. Monitoring and/or Recordkeeping Requirements

1. For each day during which the permittee burns a fuel other than natural gas, the permittee shall maintain a record of the type and quantity of fuel burned in this emission unit.

2. The permittee shall monitor the sulfur content and gross calorific value of the fuel being fired in the emission unit. Fuel sampling and analysis shall be conducted according to the procedures and at the frequency specified by 40 CFR Part 75, Appendix D.

3. The permittee shall maintain daily records of the operating hours for this emissions unit.

4. The permittee shall maintain monthly records of the following information for this emission unit:

a. the monthly operating hours for the boiler;

b. during the first 12 calendar months of operation following issuance of this permit, the permittee shall record the cumulative operating hours for each calendar month; and

b. beginning after the first 12 calendar months of operation following issuance of this permit, the rolling, 12-month summation of the operating hours.

5. The facility shall install, maintain, and operate, in accordance with the manufacturer's specifications, instrumentation sufficient to track all natural gas usage during periods of operation.

6. The permittee shall maintain records of the amounts of fuel combusted during each day, per 40 CFR 60.48c(g).

IV. Reporting Requirements

1. The permittee shall submit deviation (excursion) reports that identify each day when a fuel other than natural gas was burned in this emission unit. Each report shall be submitted within 30 days after the deviation occurs.

2. The permittee shall submit quarterly deviation (excursion) reports that identify any record which shows that the sulfur content of the natural gas exceeded 2 grains per 100 standard cubic feet. These reports are due by the dates described in Part I - General Terms and Conditions of this permit under Section (A)(2).

3. The permittee shall submit annual reports which identify any exceedances of the daily operating hours limitation, as well as the corrective actions that were taken to achieve compliance. These reports shall be submitted by January 31 of each year.

4. The permittee shall submit quarterly deviation (excursion) reports which identify all exceedances of the rolling, 12-month operating hours limitation, and for the first 12 calendar months of operation, all exceedances of the maximum allowable cumulative operating hours levels. These reports are due by the dates described in Part 1 - General Terms and Conditions of this permit under Section (A)(2).

5. This emissions unit is subject to the applicable provisions of Subpart Dc of the New Source Performance Standards (NSPS) as promulgated by the United States Environmental Protection Agency, 40 CFR Part 60. The application and enforcement of these standards are delegated to the Ohio EPA. The requirements of 40 CFR Part 60 are also federally enforceable.

Pursuant to 40 CFR Part 60.7, the permittee is hereby advised of the requirement to report the following at the appropriate times:

a. construction date (no later than 30 days after such date);

b. anticipated start-up date (not more than 60 days or less than 30 days prior to such date);

c. actual start-up date (within 15 days after such date); and

d. date of performance testing (if required, at least 30 days prior to testing).

Reports are to be sent to:

Ohio Environmental Protection Agency
DAPC - Permit Management Unit
P.O. Box 163669
Columbus, Ohio 43216-3669

and

Portsmouth Local Air Agency
605 Washington Street, Third Floor
Portsmouth, Ohio 45662

V. Testing Requirements

1. Emission Limitation:

0.05 lb/MMBtu NOx
4.95 lbs/hr NOx

Applicable Compliance Method:

Compliance with the lb/MMBtu emission limitation shall be demonstrated by multiplying the controlled AP-42 emission factor, Table 1.4-1, July 1998, (50 lbs NOx / MMscf) by the heat content of the natural gas (1 scf / 1000 Btu).

Compliance with the lbs/hr emission limitation shall be demonstrated by multiplying the lb/MMBtu emission limitation by the maximum heat input rate of 99 MMBtu/hr.

2. Emission Limitation:

0.0057 lb/MMBtu SO2
0.56 lb/hr SO2

Applicable Compliance Method:

The lb/MMBtu emission limitation was calculated from the allowable sulfur content in natural gas, 2 grains per 100 standard cubic feet. The supplier of the natural gas shall document the sulfur content of the fuel.

Compliance with the lb/hr emission limitation shall be demonstrated by multiplying the lb/MMBtu emission limitation by the maximum heat input rate of 99 MMBtu/hr.

3. Emission Limitation:

0.084 lb/MMBtu CO
8.32 lbs/hr CO

Applicable Compliance Method:

Compliance with the lb/MMBtu emission limitation shall be demonstrated by multiplying the AP-42 emission factor, Table 1.4-1, July 1998, (84 lbs CO / MMscf) by the heat content of the natural gas (1 scf / 1000 Btu).

Compliance with the lb/hr emission limitation shall be demonstrated by multiplying the lb/MMBtu emission limitation by the maximum heat input rate of 99 MMBtu/hr.

4. Emission Limitation:

0.0055 lb/MMBtu VOC
0.545 lb/hr VOC

Applicable Compliance Method:

Compliance with the lb/MMBtu emission limitation shall be demonstrated multiplying the AP-42 emission factor, Table 1.4-2, July 1998, (5.5 lbs VOC / MMscf) by the heat content of the natural gas (1 scf / 1000 Btu).

Compliance with the lb/hr emission limitation shall be demonstrated by multiplying the lb/MMBtu emission limitation by the maximum heat input rate of 99 MMBtu/hr.

5. Emission Limitation:

0.0076 lb/MMBtu PE/PM_{10}
0.75 lb/hr PE/PM_{10}

Applicable Compliance Method:

Compliance with the lb/MMBtu emission limitation shall be demonstrated by multiplying the AP-42 emission factor, Table 1.4-2, July 1998, (7.6 lbs PE / MMscf) by the heat content of the natural gas (1 scf / 1000 Btu).

Compliance with the lb/hr emission limitation shall be demonstrated by multiplying the lb/MMBtu emission limitation by the maximum heat input rate of 99 MMBtu/hr.

6. Emission Limitations:

8.7 tons of NOx per rolling 12 months
1.0 tons of SO_2 per rolling 12 months
1.3 tons of PE/PM_{10} per rolling 12 months
14.6 tons of CO per rolling 12 months
1.0 tons of VOC per rolling 12 months

Applicable Compliance Method:

Compliance with the rolling 12-month limits shall be determined by the record keeping required in Section A.III.4. The rolling 12-month summation of operating hours shall be multiplied by the hourly emissions limit for each pollutant and divided by 2000 lbs/ton in order to demonstrate compliance.

7. Emission Limitation:

Visible particulate emissions shall not exceed 20% opacity as a six-minute average, except as provided by rule.

Applicable Compliance Method:

If required, compliance shall be demonstrated in accordance with the requirements specified in OAC rule 3745-17-03(B)(1) determined according to Method 9 of 40 CFR Part 60, Appendix A.

VI. Miscellaneous Requirements

None

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.

Operations, Property, and/or Equipment	Applicable Rules/Requirements	Applicable Emissions Limitations/Control Measures
B001 - 99 MMBtu/hr natural gas fired auxiliary boiler	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

None

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.

Operations, Property, and/or Equipment	Applicable Rules/Requirements	Applicable Emissions Limitations/Control Measures
P001 - 180 MW Westinghouse 501F natural gas fired combustion turbine No 1 with duct firing operating in combined cycle mode with selective catalytic reduction (SCR) and oxidation catalyst	40 CFR 52.21 and OAC rule 3745-31-(10) through (20)	EMISSION LIMITS WITHOUT DUCT BURNER FIRING: Nitrogen oxides (NO_x) emissions shall not exceed 3.0 ppmvd at 15% Oxygen NOx emissions shall not exceed 24.1 lbs/hr. Particulate emissions (PE/PM_{10}*) shall not exceed 0.0061 lbs/MMBtu and 12.7 lbs/hr. Sulfur dioxide (SO_2) emissions shall not exceed 0.0057 lbs/MMBtu and 11.9 lbs/hr. Carbon monoxide (CO) emissions shall not exceed the following: 2.0 ppmvd at 15% oxygen (when turbine load is at or above 75% without power augmentation) 10 ppmv at 15% oxygen (with power augmentation or when turbine load is below 75%) CO emissions shall not exceed 9.8 lbs/hr when turbine load is at or above 75 % without power augmentation or 32.4

		lbs/hr with power augmentation** or when turbine load is below 75% Volatile organic compounds (VOC) emissions shall not exceed 0.002 lbs/MMBtu and 4.2 lbs/hr. Sulfuric acid (H_2SO_4) emissions shall not exceed 0.0013 lb/MMBtu and 2.72 lbs/hr. EMISSION LIMITS WITH DUCT BURNER FIRING: NO_x emissions shall not exceed 3.0 ppmvd at 15% Oxygen NOx emissions shall not exceed 30.5 lbs/hr. Particulate emissions (PE/PM_{10}) shall not exceed 0.0089 lb/MMBtu and 25.3 lbs/hr. SO_2 emissions shall not exceed 0.0057 lb/MMBtu and 16.1 lbs/hr. CO emissions shall not exceed 10 ppmvd at 15% Oxygen. CO emissions shall not exceed 61.9 lbs/hr. VOC emissions shall not exceed 0.0108 lb/MMBtu and 30.7 lbs/hr. H_2SO_4 emissions shall not exceed 0.0013 lb/MMBtu and 3.71 lbs/hr. STARTUP AND SHUTDOWN EMISSIONS (see Item A.II.3.): NO_x emissions shall not exceed 67.5 tons, based on a 12 month rolling average.

		CO emissions shall not exceed 295.8 tons, based on a 12 month rolling average. VOC emissions shall not exceed 32.4 tons, based on a 12 month rolling average. TOTAL TONS per rolling 12 months including startups and shutdowns: NO_x emissions shall not exceed 182.8 tons, based on a 12 month rolling average. SO_2 emissions shall not exceed 70.5 tons, based on a 12 month rolling average. PE/PM_{10} emissions shall not exceed 110.8 tons, based on a 12 month rolling average. CO emissions shall not exceed 529.8 tons, based on a 12 month rolling average. VOC emissions shall not exceed 148.5 tons, based on a 12 month rolling average. H_2SO_4 emissions shall not exceed 16.2 tons, based on a 12 month rolling average.
	OAC rule 3745-31-05(A)(3)	see Section A.I.2.f below. The requirements of this rule also include compliance with the requirements of 40 CFR 60 Subpart Da and GG, OAC rule 3745-18-06(F), 3745-17-11(B)(4), OAC rule 3745-17-07(A), 40 CFR 52.21, and OAC 3745-31- (10) thru (20).

	Visible particulate emissions shall not exceed 10 % opacity as a six minute average. Ammonia (NH_3) emissions shall not exceed 165.1 tpy. Formaldehyde shall not exceed 4.47 tpy. EMISSION LIMITS WITHOUT DUCT BURNER FIRING: NH_3 emissions shall not exceed 27.3 lbs/hr. Formaldehyde emissions shall not exceed 0.75 lb/hr. EMISSION LIMITS WITH DUCT BURNER FIRING: NH_3 emissions shall not exceed 37.7 lbs/hr. Formaldehyde emissions shall not exceed 1.02 lbs/hr.
40 CFR part 60, Subpart GG	see Sections A.I.2.b and A.III.6 below.
40 CFR part 60, Subpart Da	see Section A.I.2.c below.
OAC rule 3745-18-06(F)	see Section A.I.2.a below.
OAC rule 3745-17-11(B)(4)	see Section A.I.2.a below.
OAC rule 3745-17-07(A)	see Section A.I.2.a below.
40 CFR Part 63, Subpart YYYY	see Section A.I.2.e below.
40 CFR Part s 72, 73, 74, 75 and 76	see Section A.I.2.d below.
OAC rule 3745-103	see Section A.I.2.d below. * all particulate emission are assumed to be PM_{10}

	** power augmentation is when steam from the heat recovery steam generator is injected into the combustion turbine generator

2. Additional Terms and Conditions

2.a The emissions limit based on this applicable rule is equivalent to or less stringent than the limit established pursuant to 40 CFR 52.21 and OAC rule 3745-31-(10) through (20)**.**

2.b The emissions limits based on this standard are less stringent than the limits established pursuant to 40 CFR 52.21 and OAC rule 3745-31-(10) thru (20). The limit contained in this permit is more stringent that the limit calculated per CFR 60.332 for nitrogen oxides, using the manufacturer's heat rate at the manufacturer's rated load for "Y". The SO_2 limit contained in this permit, 2 grains SO_2/100scf, is more restrictive than required per CFR 60.333. Except as provided for in the terms and conditions in this permit, the permittee is not exempt from meeting any additional requirements of 40 CFR Part 60, Subpart GG.

2.c The particulate and visible emissions limits contained in this permit are more stringent than the limits established pursuant to 40 CFR Part 60, Subpart Da, in 60.42(a) and 60.42(b) respectively. And the 30-day rolling average limits, established per CFR 60.43(b) for sulfur dioxide emissions and per CFR 60.44(a) for nitrogen oxide emissions, are less stringent than the emissions limits contained in this permit, which are also established as hourly limits.

2.d The permittee is subject to the applicable requirements of 40 CFR Parts 72, 73, 74, 75, and 76, concerning the acid rain program. Per 40 CFR 72.30(b)(2)(ii) and OAC 3745-103-07(A)(2)(b) and (c), an application for a Part 72 permit shall be submitted at least 24 months prior to commencing operations. Emissions exceeding any allowances that are lawfully held under Title IV of the Act, or any regulations adopted thereunder, are prohibited.

2.e Upon promulgation, the permittee shall comply with the requirements of 40 CFR Part 63, Subpart YYYY, National Emissions Standards for Hazardous Air Pollutants (NESHAP) for Combustion Turbines.

2.f The permittee is required to perform Best Available Control Technology (BACT) review for NOx, SO_2, CO, PM_{10}, H_2SO_4 and VOC. The emissions limits based on the BACT requirements are listed under 40 CFR 52.21 and OAC rule 3745-31-(10) through (20) above. The following determinations have been made for each pollutant:

PE/PM_{10}-Burning natural gas in an efficient combustion turbine. For this permit, it is assumed that all PE emissions are PM_{10}.

NOx- Use of DLN burners and employment of SCR with a controlled emissions rate of 3.0 ppmvd at 15% oxygen.

CO- Use of oxidation catalyst with an emissions rate of 2.0 ppmvd at 15% oxygen without duct firing or use of power augmentation at greater than 75% load and 10

ppmvd at 15% oxygen with duct firing and use of power augmentation including operational periods of 60 - 75% load.
VOC- Combustion controls and use of an oxidation catalyst.
SO_2- Burning natural gas in an efficient combustion turbine and burning low sulfur fuel.
H_2SO_4-Burning natural gas in an efficient combustion turbine.

II. Operational Restrictions

1. The permittee shall burn only natural gas in this emissions unit. The maximum sulfur content of the natural gas shall not exceed 2 grains per 100 standard cubic feet.

2. The permittee shall be limited to 1199 hours of operation per year for startups and shutdowns for this emissions unit.

3. As specified in the permittee's PTI application, the maximum heat input rating of this emissions unit is 2830 MM Btu/hr. This value corresponds to a maximum natural gas fuel flow of 2.830 million scf/hr, with a lower heat value of 1000 MMBtu/million scf. The permittee shall operate this emissions unit within the parameters specified above, except for startup* and shutdown. Start-up and shut-down periods shall be defined as any time the unit is operating at less than 60 % load. A cold startup is one that occurs more than 12 hours after shutdown. A hot startup is one that occurs 12 hours or less after shutdown. Typically, cold startup periods will be 4.0 hours in duration and hot startup periods 2.0 hours in duration, and shut-down periods 1.0 hour in duration. Each startup and shutdown shall be limited to the following:

Pollutant	lbs/cold startup	lbs/hot startup	lbs/shutdown
NOx	497	256	79
CO	1777	935	565
VOC	163	87	80

*Startup for testing purposes shall be defined as the date when emission unit P001 is set in operation for any purpose.

4. The SCR system shall be in operation at all times, except for periods of startup and shutdown, defined as any time unit is operating at less than 60% load.

III. Monitoring and/or Recordkeeping Requirements

1. The permittee shall maintain monthly records of the following information for this emissions unit:

a. number and duration of each cold and hot start-up;
b. number and duration of each shut-down; and
c. the start-up and shut-down emissions* for NOx, CO, and VOC in tons per month.

* The start-up and shut-down emissions shall be based on CEM data, if available. If CEM data is not available, the emissions for each start-up and shut-down shall be based on the pound per event

values specified in Section A.II.3, prorated by the actual duration of the event, as recorded per Section A.III.3 below.

2. The permittee shall maintain monthly records of the following information for this emissions unit:

a. the natural gas usage rate for each month (in standard cubic feet);
b. the hours of operation for the combustion turbine;
c. the hours of operation for the duct burner;
d. the monthly emissions for PE/PM_{10}, NOx, SO2, CO, VOC, formaldehyde, ammonia, and H_2SO_4, in tons; and
e. the rolling, 12-month summation of the emissions for PE/PM_{10}, NOx, SO2, CO, VOC, and H_2SO_4 (including start-up and shut-down emissions), in tons.

At the end of each year the permittee shall calculate the annual emissions from each of the pollutants above, in order to fulfill annual reporting requirements.

3. The permittee shall maintain records of the duration of each start-up and shut-down if continuous emissions monitoring system (CEMS) data is not available to document the duration of each event as required in Section A.III.1.

4. The permittee shall install, operate, maintain and certify continuous emissions monitoring system (CEMS) and continuous emissions rate monitoring system (CERMS) equipment to continuously monitor and record NO_x* ,CO, and O_2 from this emissions unit in the units of the standards established in this permit. Such continuous monitoring and recording equipment shall comply with the requirements specified in 40 CFR Part 60.13 and 40 CFR Part 75, or as approved in writing by the Ohio EPA, Central Office for this emissions unit.

The permittee shall maintain records of all data obtained by the continuous NO_x, CO, and O_2 monitoring systems including, but not limited to: results of daily zero/span calibration checks; magnitude of manual calibration adjustments; parts per million NO_x, CO, and per cent O_2 on an instantaneous (one-minute) basis; and emissions of NO_x and CO in pounds per million Btu and pounds per hour, in one-hour averages.

In conjunction with the operation of the NOx and CO CEMS and CERMS, the permittee shall install, operate and maintain a system to monitor when the duct burners are being fired. The data measured by this system shall be compiled with the data recorded by the NOx and CO CEMS and CERMS.

* The installation and operation of systems to continuously monitor and record emissions of NOx may be performed in lieu of monitoring the nitrogen content of the fuels being fired in the turbine, as required by 40 CFR 60.334(b).

5. The permittee shall install, operate, maintain and certify equipment to continuously monitor and record the actual fuel flow to the turbine and duct burner when the turbine is in operation. Such continuous monitoring and recording equipment shall comply with the requirements specified in 40 CFR Part 75. If the fuel flow monitoring and/or recording equipment is (are) not in service when

the emissions unit is in operation, the permittee shall comply with the appropriate missing data procedures specified in 40 CFR Part 75, Subparts D and E. The permittee shall maintain an information management system for this emissions unit capable of monitoring and recording the fuel flow (million cubic feet) to the turbine and to the duct burner, hours of operation with duct burner firing, and hours of operation without duct burner firing.

6. The permittee shall maintain documentation on the sulfur contents and heating values of the fuel received. ASTM D 1072-80, D 3031-81, D 4084-82, or D 3246-81 shall be used for the sulfur content of gaseous fuels. The permittee shall determine the heat value of the fuel using ASTM method D240. The applicable ranges of some ASTM methods mentioned above are not adequate to measure the levels of sulfur in some fuel gases. Dilution of samples before analysis (with verification of the dilution ratio) may be used, subject to the approval of the Ohio EPA. The newest or most recent revisions to the applicable test method shall be used for these analyses. Fuel sampling and analysis shall be conducted according to the procedures and at the frequency specified by 40 CFR Part 75, Appendix D.

7. The permittee shall determine the hourly heat input rate to the combustion turbine and duct burner from the fuel flow rate as determined in term Section A.III.5, and gross calorific value as determined in term A.III.6. The heat input rate shall be calculated in accordance with the procedures in 40 CFR Part 75, Appendix F, Section 5.

8. Initial compliance with the permit limits shall be demonstrated through the testing requirements found in Section A.V.1. On-going compliance with permit limits for NOx and CO will be demonstrated with CEMS/CERMS, and associated recordkeeping.

IV. Reporting Requirements

1. The permittee shall submit deviation (excursion) reports that identify each day when a fuel other than natural gas was burned in this emission unit. Each report shall be submitted within 30 days after the deviation occurred.

2. Pursuant to OAC rules 3745-15-04, 3745-35-02, and ORC Sections 3704.03(I) and 3704.03(l) and 40 CFR Part 60.7 and 60.13 (h), the permittee shall submit reports within 30 days following the end of each calendar quarter to the Portsmouth Local Air Agency (or regulating agency) documenting the date, commencement and completion times, duration, magnitude, reason (if known), and corrective actions taken (if any), of all instances of NOx or CO values, as recorded by the CEMS, in excess of the applicable limits specified in the terms and conditions of this permit. These reports shall also contain the total NOx and CO emissions for the calendar quarter (in tons).

The permittee shall submit reports within 30 days following the end of each calendar quarter to the Portsmouth Local Air Agency (or regulating agency) documenting any continuous NOx, CO, or O_2 monitoring system down time while the emission unit was on line (date, time, duration and reason) along with any corrective action(s) taken. The permittee shall provide the emission unit operating time during the reporting period and the date, time, reason and corrective action(s) taken for each time period of emission unit and control equipment malfunctions. The total operating time of the emissions unit and the total operating time of the analyzer, while the emission unit was on line, shall

also be included in the quarterly report. These quarterly excess emission reports shall be submitted by January 30, April 30, July30, and October 30 of each year and shall address the data obtained during the previous calendar quarter.

If there are no excess emissions during the calendar quarter, the permittee shall submit a statement to that effect along with the emissions unit operating time during the reporting period and the date, time, reason, and corrective action(s) taken for each time period of emission unit, control equipment, and/or monitoring system malfunctions. The total operating time of the emission unit and the total operating time of the analyzer while the emission unit was on line also shall be included in the quarterly report. These quarterly excess emission reports shall be submitted by January 30, April 30, July 30, and October 30 of each year and shall address the data obtained during the previous calendar quarter.

Pursuant to OAC rules 3745-15-04, 3745-35-02, and ORC Sections 3704.03(I) and 3704.031, the permittee shall submit a summary of the excess emission report pursuant to 40 CFR Part 60.7. The summary shall be submitted to the Portsmouth Local Air Agency (or regulating agency) within 30 days following the end of each calendar quarter in a manner prescribed by the Director

3. The permittee shall submit quarterly deviation (excursion) reports that identify any record which shows that the sulfur content of the natural gas exceeded 2 grains per 100 standard cubic feet. These reports are due by the date described in Part I - General Terms and Conditions of this permit under Section (A)(2).

4. The permittee shall submit annual deviation (excursion) reports, by February 1 of each year, that identify any exceedance of the restriction on the hours of startup and shutdowns for this emissions unit (1199 hours).

5. The permittee shall submit quarterly deviation (excursion) reports that identify each time when this emissions unit was not in compliance with the start-up/shut-down restrictions specified under Section II.3, or when records were not maintained as required in Sections A.III.1 and A.III.3. These reports are due by the date described in Part I - General Terms and Conditions of this permit.

6. In lieu of the excess emissions reports required under 40 CFR Part 60.334, the permittee shall submit excess emissions reports for this emissions unit in accordance with this permit. These reports are due by the date described in Part I - General Terms and Conditions of this permit.

7. This emission unit is subject to the applicable provisions of Subpart Da and GG of the New Source Performance Standards (NSPS), as promulgated by the United States Environmental Protection Agency in 40 CFR Part 60. The application and enforcement of these standards are delegated to the Ohio EPA. The requirements of 40 CFR Part 60 are also federally enforceable.

Pursuant to 40 CFR Part 60.7, the permittee is hereby advised of the requirement to report the following at the appropriate times:

a. construction date (no later than 30 days after such date);

b. anticipated start-up date (not more than 60 days or less than 30 days prior to such date);

c. actual start-up date (within 15 days after such date); and,

d. date of performance testing (if required, at least 30 days prior to testing).

Reports are to be sent to :

Ohio Environmental Protection Agency
DAPC - Permit Management Unit
P.O. Box 163669
Columbus, Ohio 43216-3669

and

Portsmouth Local Air Agency
605 Washington Street, Third Floor
Portsmouth, Ohio 45662

V. Testing Requirements

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

a. The emission testing shall be conducted within 60 days after achieving the maximum production rate at which the emission unit will be operated, but not later than 180 days after initial startup of such emission unit.

b. The emission testing shall be conducted to demonstrate compliance with the NOx and CO outlet concentrations; the mass emission limitations for NOx*, CO, Formaldehyde, VOC, $PE/PM_{10,}$ and ammonia; and the pound per million Btu for PE/PM_{10} and VOC.

c. The following test method(s) shall be employed to demonstrate compliance with the above emission limitations: for NOx, Method 20 of 40 CFR Part 60, Appendix A; for PE/PM_{10}, Methods 201 and 202 of 40 CFR Part 60, Appendix A; for Formaldehyde, SW-846 Method 0011or EPA Method 316; for VOC, Method 25 of 40 CFR Part 60, Appendix A; for CO Method 10 of 40 CFR Part 60, Appendix A; and for ammonia, CTM-027. Alternative USEPA approved test methods may be used with prior approval from the Ohio EPA.

d. The testing shall be conducted while the emission unit is operating at or near its maximum capacity with and without duct burner firing and with power augmentation, unless otherwise specified or approved by Ohio EPA Central Office or Portsmouth Local Air Agency.

e. Not later than 30 days prior to the proposed test date(s), the permittee shall submit an "Intent to Test" notification to the Portsmouth Local Air Agency (or regulating agency). The "Intent to Test" notification shall describe in detail the proposed test methods and procedures, the

emission unit operating parameters, the times(s) and date(s) of the test(s), and the person(s) who will be conducting these test(s). Failure to submit such notification for review and approval prior to the tests may result in the Ohio EPA Central Office or Portsmouth Local Air Agency's refusal to accept the results of the emission test(s).

f. Personnel from Portsmouth Local Air Agency (or regulating agency) shall be permitted to witness the tests, 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.

g. A comprehensive written report on the results of the emission test(s) shall be signed by the person or persons responsible for the tests and submitted to the Portsmouth Local Air Agency (or regulating agency) 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 Portsmouth Local Air Agency (or regulating agency).

In lieu of the test methods and procedures required under 40 CFR Part 60.335, the permittee shall follow the testing requirements in accordance with this permit.

2. Within 60 days after achieving the maximum production rate at which the emission unit will be operated, but not later than 180 days after initial startup of such emissions unit, the permittee shall conduct certification tests of the continuous NOx, CO and O2 monitoring systems pursuant to ORC Section 3704.03(I), 40 CFR Part 60, Appendix B, Performance Specification 2, 3, 4, 6* and 40 CFR Part 75, unless an extension is granted by the Ohio EPA. Personnel from the Portsmouth Local Air Agency and Ohio EPA Central Office shall be notified 30 days prior to initiation of the applicable tests and shall be permitted to examine equipment and witness the certification tests. In accordance with OAC rule 3745-15-04, copies of all test results shall be submitted within 30 days after the test is completed. Copies of the test results shall be sent to the Portsmouth Local Air Agency (or regulating agency) and the Ohio EPA, Central Office. Certification of the continuous NOx, CO and O_2 CEMS/CERMS shall be granted upon determination by the Ohio EPA, Central Office that the system meets all requirements of the appropriate Sections of ORC Section 3704.03(I), 40 CFR Part 60, Appendix B, Performance Specification 2, 3, 4 and 6* and 40 CFR Part 75.

* The permittee may use certified NOx CEMS in conjunction with a fuel flow monitor as described in 40 CFR Part 75, and a certified CO CEMS in conjunction with a fuel flow monitor (in a manner similar to that used for NOx) to meet these requirements. The relative accuracy requirements of Performance Specification 6 shall apply in either case.

3. Compliance with the emission limitations in Section A.I.1 of these terms and conditions shall be determined in accordance with the following methods:

a. Emission Limitation:

NOx emissions shall not exceed:

3.0 ppmvd at 15% Oxygen
24.1 lbs/hr without duct burner firing
30.5 lbs/hr with duct burner firing
182.8 tons based on a 12 month rolling summation, which includes 67.5 tons for startups and shutdowns.

Applicable Compliance Method:

Initial compliance with the allowable outlet concentrations and the pound per hour emission limitations shall be demonstrated by the performance testing as described in Section A.V.1, and continual compliance with those limitations shall be demonstrated by the use of the CEMS and CERMS, as required in Section A.III.4. Monthly emissions shall be determined by the adding the hourly CERMS data at the end of each month. If at any time during the month the CERMS data is not available, the hours of start-up/shutdown emissions shall be determined as required in Section A.III.3 and the daily average CERMS data for the mode of operations (power augmentation, with or without duct burners etc.) will be added in place of the CERMS actual hourly average. At the end of each month the monthly emissions (required in Sections A.III.1 and A.III.2) shall be added to the previous 11 months to determine the total rolling 12-month emissions.

b. Emission Limitation:

Particulate emissions shall not exceed:
12.7 lbs/hr without duct burner firing
0.0061 lb/MMBtu without duct burner firing
25.3 lbs/hr with duct burner firing
0.0089 lb/MMBtu with duct burner firing
110.8 tons, based on a 12 month rolling summation

Applicable Compliance Method:

Compliance with the pound per hour and pound per MMBtu emission limitations shall be demonstrated by the performance testing in Section A.V.1. Monthly emissions shall be calculated by multiplying the hourly emissions rate, determined from the most recent stack test conducted to demonstrate compliance, by the actual annual hours of operation, as recorded in Section A.III.2. At the end of each month the monthly emissions (required in Section A.III.2) shall be added to the previous 11 months to determine the total rolling 12-month emissions.

c. Emission Limitation:

SO2 emissions shall not exceed:
11.9 lbs/hr without duct burner firing
16.1 lbs/hr with duct burner firing
0.0057 lb/MMBtu with and without duct burner firing
70.5 tons, based on a 12 month rolling summation.

Applicable Compliance Methods:

Compliance with the pound per hour and pound per MMBtu emission limitations shall be demonstrated by the recordkeeping required in Sections A.III.2, A.III.5, and A.III.6. Monthly emissions shall be calculated by multiplying the hourly emissions rate, by the actual annual hours of operation, as recorded in Section A.III.2. If required, compliance shall be demonstrated in accordance with the Method 6 of 40 CFR Part 60, Appendix A. At the end of each month the monthly emissions (required in Section A.III.2) shall be added to the previous 11 months to determine the total rolling 12-month emissions.

d. Emission Limitation:

VOC emissions shall not exceed
4.2 lbs/hr without duct burner firing
0.002 lbs/MMBtu without duct burner firing
30.7 lbs/hr with duct burner firing
0.0108 lbs/MMBtu with duct burner firing
148.5 tons, based on a 12 month rolling summation, which includes 32.9 tons for startups and shutdowns.

Applicable Compliance Method:

Initial compliance with the pound per hour and pounds per MMBtu emission limitations shall be demonstrated by the performance testing as described in Section A.V.1. Monthly emissions shall be determined by multiplying the hourly emissions rate, as determined from the most recent stack test conducted to demonstrate compliance, by the actual hours of operation, as recorded in Section A.III.2, and adding the start-up/shutdown emissions, calculated from and maintained as required in Sections A.III.1 and A.III.3. At the end of each month the monthly emissions (required in Sections A.III.1 and A.III.2) shall be added to the previous 11 months to determine the total rolling 12-month emissions.

e. Emission Limitation:

CO emissions shall not exceed
2 ppmvd at 15 % oxygen when the turbine load is at or above 75% without duct burner firing or the use of power augmentation
10 ppmvd at 15 % oxygen without duct burner firing but with the use of power augmentation or when the turbine load is below 75%
10 ppmvd at 15% oxygen with duct burner firing
9.8 lbs/hr when the turbine load is at or above 75% without duct burner firing or the use of power augmentation
32.4 lbs/hr without duct burner firing but with the use of power augmentation or when the turbine load is below 75%
61.9 lbs/hr with duct burner firing and/or use of power augmentation
529.8 tons based on a 12 month rolling summation, which includes 298.8 tons for startups and shutdowns.

295.8 tons for startups and shutdowns, based on a 12 month rolling summation

Applicable Compliance Method:

Initial compliance with the allowable outlet concentrations and the pound per hour emission limitations shall be demonstrated by the performance testing as described in Section A.V.1, and continual compliance with those limitations shall be demonstrated by the use of the CEMS and CERMS, as required in Section A.III.4. Monthly emissions shall be determined by the adding the hourly CERMS data at the end of each month. If at any time during the month the CERMS data is not available, the hours of start-up/shutdown emissions shall be determined as required in Section A.III.3 and the daily average CERMS data for the mode of operations (power augmentation, with or without duct burners etc.) will be added in place of the CERMS actual hourly average. At the end of each month the monthly emissions (required in Sections A.III.1 and A.III.2) shall be added to the previous 11 months to determine the total rolling 12-month emissions.

f. Emission Limitation:

ammonia (NH3) emissions shall not exceed
27.3 lbs/hr without duct burner firing
37.7 lbs/hr with duct burner firing
165.1 tons per year

Applicable Compliance Method:

Compliance with the pound per hour emission limitations shall be demonstrated by the performance testing in Section A.V.1. Monthly emissions shall be calculated by multiplying the hourly emissions rate, determined from the most recent stack test conducted to demonstrate compliance, by the actual annual hours of operation, as recorded in Section A.III.2. Compliance with the annual emission limitation shall be demonstrated at the end of each year by adding the monthly records maintained in Section A.III.2.

g. Emission Limitation:

Formaldehyde emission shall not exceed
0.75 lb/hr without duct burner firing
1.02 lbs/hr with duct burner firing
4.47 TPY

Applicable Compliance Method:

Compliance with the pound per hour emission limitations shall be demonstrated by the performance testing in Section A.V.1. Monthly emissions shall be calculated by multiplying the hourly emissions rate, determined from the most recent stack test conducted to demonstrate compliance, by the actual annual hours of operation, as recorded in Section A.III.2. Compliance with the annual emission limitation shall be demonstrated at the end of each year by adding the monthly records maintained in Section A.III.2.

h. Emission Limitation:

Sulfuric acid (H2SO4) emissions shall not exceed
2.72 lbs/hr without duct burner firing
3.71 lbs/hr with duct burner firing
16.2 tons based on a 12 month rolling summation
0.0013 lbs/MMBtu with and without duct burner firing

Applicable Compliance Method:

Compliance with the pound per hour and pounds per MMBtu emission limitations shall be demonstrated by the recordkeeping required in Sections A.III.2, A.III.5, and A.III.6 for the pollutant SO_2. It is estimated (by the permittee) that approximately 15% of the SO_2 emissions are converted to sulfuric acid. Monthly emissions shall be calculated by the multiplying the hourly emissions rate determined for SO_2 by 15%, and this hourly rate by the actual annual hours of operation, as recorded in Section A.III.2. At the end of each month the monthly emissions (required in Section A.III.2) shall be added to the previous 11 months to determine the total rolling 12-month emissions.

i. Emission Limitation:

Visible particulate emissions from any stack shall not exceed 10 percent opacity as a six minute average.

Applicable Compliance Method:

If required, compliance shall be demonstrated in accordance with the requirements specified in OAC rule 3745-17-03(B)(1) determined according to Method 9 of 40 CFR Part 60, Appendix A.

VI. Miscellaneous Requirements

1. In accordance with good engineering practices, the SCR unit on emissions unit P001 shall be installed, operated and maintained in accordance with the manufacturer's recommendations, with any modifications deemed necessary by the permittee. The permittee shall maintain on site a copy of the operation & maintenance manual, as provided by the manufacturer.

2. Prior to the installation of the continuous NO_x and CO monitoring systems, the permittee shall submit information detailing the proposed location of the sampling site in accordance with the siting requirements in 40 CFR Part 60, Appendix B, Performance Specification 2, 4 and 6* (or as described in condition A.V.1.) for approval by the Ohio EPA, Central Office.

* for Performance Specification 6 see Section V.2.

3. Within 180 days of the effective date of this permit, the permittee shall develop a written quality assurance/quality control plan for the continuous NOx, CO, and O_2 monitoring system designed to ensure continuous valid and representative readings of NOx, CO, and O_2 emissions in units of the applicable standard. The plan shall follow the requirements of the appropriate Sections of 40 CFR Part 60, Appendix F and 40 CFR Part 75, Appendix B, or as approved by the Ohio EPA, Central Office. The quality assurance/quality control plan and logbook dedicated to the continuous NOx, CO, and O_2 monitoring system must be kept on site and available for inspection during regular office hours.

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.

Operations, Property, and/or Equipment	Applicable Rules/Requirements	Applicable Emissions Limitations/Control Measures
P001 - 180 MW Westinghouse 501F natural gas fired combustion turbine No 1 with duct firing operating in combined cycle mode with selective catalytic reduction (SCR) and oxidation catalyst	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

None

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.

Operations, Property, and/or Equipment	Applicable Rules/Requirements	Applicable Emissions Limitations/Control Measures
P002 - 180 MW Westinghouse 501F natural gas fired combustion turbine No 2 with duct firing operating in combined cycle mode controlled by selective catalytic reduction (SCR) and oxidation catalyst	40 CFR 52.21 and OAC rule 3745-31-(10) thru (20)	EMISSION LIMITS WITHOUT DUCT BURNER FIRING: Nitrogen oxides (NO_x) emissions shall not exceed 3.0 ppmvd at 15% Oxygen NOx emissions shall not exceed 24.1 lbs/hr. Particulate emissions (PE/PM_{10}*) shall not exceed 0.0061 lb/MMBtu and 12.7 lbs/hr. Sulfur dioxide (SO_2) emissions shall not exceed 0.0057 lb/MMBtu and 11.9 lbs/hr. Carbon monoxide (CO) emissions shall not exceed the following: 2.0 ppmvd at 15% oxygen (when turbine load is at or above 75% without power augmentation) 10 ppmv at 15% oxygen (with power augmentation or when turbine load is below 75%) CO emissions shall not exceed 9.8 lbs/hr when turbine load is at or above 75 % without power augmentation or 32.4 lbs/hr with power augmentation** or when turbine load is below 75%

Volatile organic compounds (VOC) emissions shall not exceed 0.002 lb/MMBtu and 4.2 lbs/hr.

Sulfuric acid (H_2SO_4) emissions shall not exceed 0.0013 lb/MMBtu and 2.72 lbs/hr.

EMISSION LIMITS WITH DUCT BURNER FIRING:

NO_x emissions shall not exceed 3.0 ppmvd at 15% Oxygen

NOx emissions shall not exceed 30.5 lbs/hr.

Particulate emissions (PE/PM_{10}) shall not exceed 0.0089 lb/MMBtu and 25.3 lbs/hr.

SO_2 emissions shall not exceed 0.0057 lb/MMBtu and 16.1 lbs/hr.

CO emissions shall not exceed 10 ppmvd at 15% Oxygen.

CO emissions shall not exceed 61.9 lbs/hr.

VOC emissions shall not exceed 0.0108 lb/MMBtu and 30.7 lbs/hr.

H_2SO_4 emissions shall not exceed 0.0013 lb/MMBtu and 3.71 lbs/hr.

STARTUP AND SHUTDOWN EMISSIONS (see Item A.II.3.):

NO_x emissions shall not exceed 67.5 tons, based on a 12 month rolling average.

CO emissions shall not exceed 295.8 tons, based on a 12 month rolling average.

		VOC emissions shall not exceed 32.4 tons, based on a 12 month rolling average. TOTAL TONS per rolling 12 months including startups and shutdowns: NO_x emissions shall not exceed 182.8 tons, based on a 12 month rolling average. SO_2 emissions shall not exceed 70.5 tons, based on a 12 month rolling average. PE/PM_{10} emissions shall not exceed 110.8 tons, based on a 12 month rolling average. CO emissions shall not exceed 529.8 tons, based on a 12 month rolling average. VOC emissions shall not exceed 148.5 tons, based on a 12 month rolling average. H_2SO_4 emissions shall not exceed 16.2 tons, based on a 12 month rolling average. see Section A.I.2.f below.
	OAC rule 3745-31-05(A)(3)	The requirements of this rule also include compliance with the requirements of 40 CFR 60 Subpart Da and GG, OAC rule 3745-18-06(F), 3745-17-11(B)(4), OAC rule 3745-17-07(A), 40 CFR 52.21, and OAC 3745-31- (10) thru (20). Visible particulate emissions shall not exceed 10 % opacity as a six minute average. Ammonia (NH_3) emissions shall not exceed 165.1 tpy.

	Formaldehyde shall not exceed 4.47 tpy. EMISSION LIMITS WITHOUT DUCT BURNER FIRING: NH_3 emissions shall not exceed 27.3 lbs/hr. Formaldehyde emissions shall not exceed 0.75 lb/hr. EMISSION LIMITS WITH DUCT BURNER FIRING: NH_3 emissions shall not exceed 37.7 lbs/hr. Formaldehyde emissions shall not exceed 1.02 lbs/hr.
40 CFR part 60, Subpart GG	see Sections A.I.2.b and A.III.6 below.
40 CFR part 60, Subpart Da	see Section A.I.2.c below.
OAC rule 3745-18-06(F)	see Section A.I.2.a below.
OAC rule 3745-17-11(B)(4)	see Section A.I.2.a below.
OAC rule 3745-17-07(A)	see Section A.I.2.a below.
40 CFR Part 63, Subpart YYYY	see Section A.I.2.e below.
40 CFR Part 75	see Section A.I.2.d below.
OAC rule 3745-103	see Section A.I.2.d below.
	* all particulate emission are assumed to be PM_{10} ** power augmentation is when steam from the heat recovery steam generator is injected into the combustion turbine generator

2. Additional Terms and Conditions

2.a The emissions limit based on this applicable rule is equivalent to or less stringent than the limit established pursuant to 40 CFR 52.21 and OAC rule 3745-31-(10) through (20)**.**

2.b The emissions limits based on this standard are less stringent than the limits established pursuant to 40 CFR 52.21 and OAC rule 3745-31-(10) thru (20). The limit contained in this permit is more stringent that the limit calculated per CFR 60.332 for nitrogen oxides, using the manufacturer's heat rate at the manufacturer's rated load for "Y". The SO_2 limit contained in this permit, 2 grains SO_2/100scf, is more restrictive than required per CFR 60.333. Except as provided for in the terms and conditions in this permit, the permittee is not exempt from meeting any additional requirements of 40 CFR Part 60, Subpart GG.

2.c The particulate and visible emissions limits contained in this permit are more stringent than the limits established pursuant to 40 CFR Part 60, Subpart Da, in 60.42(a) and 60.42(b) respectively. And the 30-day rolling average limits, established per CFR 60.43(b) for sulfur dioxide emissions and per CFR 60.44(a) for nitrogen oxide emissions, are less stringent than the emissions limits contained in this permit, which are also established as hourly limits.

2.d The permittee is subject to the applicable requirements of 40 CFR Parts 72, 73, 74, 75, and 76, concerning the acid rain program. Per 40 CFR 72.30(b)(2)(ii) and OAC 3745-103-07(A)(2)(b) and (c), an application for a Part 72 permit shall be submitted at least 24 months prior to commencing operations. Emissions exceeding any allowances that are lawfully held under Title IV of the Act, or any regulations adopted thereunder, are prohibited.

2.e Upon promulgation, the permittee shall comply with the requirements of 40 CFR Part 63, Subpart YYYY, National Emissions Standards for Hazardous Air Pollutants (NESHAP) for Combustion Turbines.

2.f The permittee is required to perform Best Available Control Technology (BACT) review for NOx, SO_2, CO, PM_{10}, H_2SO_4 and VOC. The emissions limits based on the BACT requirements are listed under 40 CFR 52.21 and OAC rule 3745-31-(10) through (20) above. The following determinations have been made for each pollutant:

PE/PM_{10}-Burning natural gas in an efficient combustion turbine. For this permit, it is assumed that all PE emissions are PM_{10}.

NOx- Use of DLN burners and employment of SCR with a controlled emissions rate of 3.0 ppmvd at 15% oxygen.

CO- Use of oxidation catalyst with an emissions rate of 2.0 ppmvd at 15% oxygen without duct firing or use of power augmentation at greater than 75% load and 10 ppmvd at 15% oxygen with duct firing and use of power augmentation including operational periods of 60 - 75% load.

VOC- Combustion controls and use of an oxidation catalyst.

SO_2- Burning natural gas in an efficient combustion turbine and burning low sulfur fuel.

H_2SO_4-Burning natural gas in an efficient combustion turbine.

II. Operational Restrictions

1. The permittee shall burn only natural gas in this emissions unit. The maximum sulfur content of the natural gas shall not exceed 2 grains per 100 standard cubic feet.

2. The permittee shall be limited to 1199 hours of operation per year for startups and shutdowns for this emissions unit.

3. As specified in the permittee's PTI application, the maximum heat input rating of this emissions unit is 2830 MM Btu/hr. This value corresponds to a maximum natural gas fuel flow of 2.830 million scf/hr, with a lower heat value of 1000 MMBtu/million scf. The permittee shall operate this emissions unit within the parameters specified above, except for startup* and shutdown. Start-up and shut-down periods shall be defined as any time the unit is operating at less than 60 % load. A cold startup is one that occurs more than 12 hours after shutdown. A hot startup is one that occurs 12 hours or less after shutdown. Typically, cold startup periods will be 4.0 hours in duration and hot startup periods 2.0 hours in duration, and shut-down periods 1.0 hour in duration. Each startup and shutdown shall be limited to the following:

Pollutant	lbs/cold startup	lbs/hot startup	lbs/shutdown
NOx	497	256	79
CO	1777	935	565
VOC	163	87	80

*Startup for testing purposes shall be defined as the date when emission unit P001 is set in operation for any purpose.

4. The SCR system shall be in operation at all times, except for periods of startup and shutdown, defined as any time unit is operating at less than 60% load.

III. Monitoring and/or Recordkeeping Requirements

1. The permittee shall maintain monthly records of the following information for this emissions unit:

a. number and duration of each cold and hot start-up;
b. number and duration of each shut-down; and
c. the start-up and shut-down emissions* for NOx, CO, and VOC in tons per month.

* The start-up and shut-down emissions shall be based on CEM data, if available. If CEM data is not available, the emissions for each start-up and shut-down shall be based on the pound per event values specified in Section A.II.3, prorated by the actual duration of the event, as recorded per Section A.III.3 below.

2. The permittee shall maintain monthly records of the following information for this emissions unit:

a. the natural gas usage rate for each month (in standard cubic feet);
b. the hours of operation for the combustion turbine;
c. the hours of operation for the duct burner;
d. the monthly emissions for PE/PM_{10}, NOx, SO2, CO, VOC, formaldehyde, ammonia, and H_2SO_4, in tons; and
e. the rolling, 12-month summation of the emissions for PE/PM_{10}, NOx, SO2, CO, VOC, and H_2SO_4 (including start-up and shut-down emissions), in tons.

At the end of each year the permittee shall calculate the annual emissions from each of the pollutants above, in order to fulfill annual reporting requirements.

3. The permittee shall maintain records of the duration of each start-up and shut-down if continuous emissions monitoring system (CEMS) data is not available to document the duration of each event as required in Section A.III.1.

4. The permittee shall install, operate, maintain and certify continuous emissions monitoring system (CEMS) and continuous emissions rate monitoring system (CERMS) equipment to continuously monitor and record NO_x* ,CO, and O_2 from this emissions unit in the units of the standards established in this permit. Such continuous monitoring and recording equipment shall comply with the requirements specified in 40 CFR Part 60.13 and 40 CFR Part 75, or as approved in writing by the Ohio EPA, Central Office for this emissions unit.

The permittee shall maintain records of all data obtained by the continuous NO_x, CO, and O_2 monitoring systems including, but not limited to: results of daily zero/span calibration checks; magnitude of manual calibration adjustments; parts per million NO_x, CO, and per cent O_2 on an instantaneous (one-minute) basis; and emissions of NO_x and CO in pounds per million Btu and pounds per hour, in one-hour averages.

In conjunction with the operation of the NOx and CO CEMS and CERMS, the permittee shall install, operate and maintain a system to monitor when the duct burners are being fired. The data measured by this system shall be compiled with the data recorded by the NOx and CO CEMS and CERMS.

* The installation and operation of systems to continuously monitor and record emissions of NOx may be performed in lieu of monitoring the nitrogen content of the fuels being fired in the turbine, as required by 40 CFR 60.334(b).

5. The permittee shall install, operate, maintain and certify equipment to continuously monitor and record the actual fuel flow to the turbine and duct burner when the turbine is in operation. Such continuous monitoring and recording equipment shall comply with the requirements specified in 40 CFR Part 75. If the fuel flow monitoring and/or recording equipment is (are) not in service when the emissions unit is in operation, the permittee shall comply with the appropriate missing data procedures specified in 40 CFR Part 75, Subparts D and E. The permittee shall maintain an

information management system for this emissions unit capable of monitoring and recording the fuel flow (million cubic feet) to the turbine and to the duct burner, hours of operation with duct burner firing, and hours of operation without duct burner firing.

6. The permittee shall maintain documentation on the sulfur contents and heating values of the fuel received. ASTM D 1072-80, D 3031-81, D 4084-82, or D 3246-81 shall be used for the sulfur content of gaseous fuels. The permittee shall determine the heat value of the fuel using ASTM method D240. The applicable ranges of some ASTM methods mentioned above are not adequate to measure the levels of sulfur in some fuel gases. Dilution of samples before analysis (with verification of the dilution ratio) may be used, subject to the approval of the Ohio EPA. The newest or most recent revisions to the applicable test method shall be used for these analyses. Fuel sampling and analysis shall be conducted according to the procedures and at the frequency specified by 40 CFR Part 75, Appendix D.

7. The permittee shall determine the hourly heat input rate to the combustion turbine and duct burner from the fuel flow rate as determined in term Section A.III.5, and gross calorific value as determined in term A.III.6. The heat input rate shall be calculated in accordance with the procedures in 40 CFR Part 75, Appendix F, Section 5.

8. Initial compliance with the permit limits shall be demonstrated through the testing requirements found in Section A.V.1. On-going compliance with permit limits for NOx and CO will be demonstrated with CEMS/CERMS, and associated recordkeeping.

IV. Reporting Requirements

1. The permittee shall submit deviation (excursion) reports that identify each day when a fuel other than natural gas was burned in this emission unit. Each report shall be submitted within 30 days after the deviation occurred.

2. Pursuant to OAC rules 3745-15-04, 3745-35-02, and ORC Sections 3704.03(I) and 3704.03(l) and 40 CFR Part 60.7 and 60.13 (h), the permittee shall submit reports within 30 days following the end of each calendar quarter to the Portsmouth Local Air Agency (or regulating agency) documenting the date, commencement and completion times, duration, magnitude, reason (if known), and corrective actions taken (if any), of all instances of NOx or CO values, as recorded by the CEMS, in excess of the applicable limits specified in the terms and conditions of this permit. These reports shall also contain the total NOx and CO emissions for the calendar quarter (in tons).

The permittee shall submit reports within 30 days following the end of each calendar quarter to the Portsmouth Local Air Agency (or regulating agency) documenting any continuous NOx, CO, or O_2 monitoring system down time while the emission unit was on line (date, time, duration and reason) along with any corrective action(s) taken. The permittee shall provide the emission unit operating time during the reporting period and the date, time, reason and corrective action(s) taken for each time period of emission unit and control equipment malfunctions. The total operating time of the emissions unit and the total operating time of the analyzer, while the emission unit was on line, shall also be included in the quarterly report. These quarterly excess emission reports shall be submitted

by January 30, April 30, July30, and October 30 of each year and shall address the data obtained during the previous calendar quarter.

If there are no excess emissions during the calendar quarter, the permittee shall submit a statement to that effect along with the emissions unit operating time during the reporting period and the date, time, reason, and corrective action(s) taken for each time period of emission unit, control equipment, and/or monitoring system malfunctions. The total operating time of the emission unit and the total operating time of the analyzer while the emission unit was on line also shall be included in the quarterly report. These quarterly excess emission reports shall be submitted by January 30, April 30, July 30, and October 30 of each year and shall address the data obtained during the previous calendar quarter.

Pursuant to OAC rules 3745-15-04, 3745-35-02, and ORC Sections 3704.03(I) and 3704.031, the permittee shall submit a summary of the excess emission report pursuant to 40 CFR Part 60.7. The summary shall be submitted to the Portsmouth Local Air Agency (or regulating agency) within 30 days following the end of each calendar quarter in a manner prescribed by the Director

3. The permittee shall submit quarterly deviation (excursion) reports that identify any record which shows that the sulfur content of the natural gas exceeded 2 grains per 100 standard cubic feet. These reports are due by the date described in Part I - General Terms and Conditions of this permit under Section (A)(2).

4. The permittee shall submit annual deviation (excursion) reports, by February 1 of each year, that identify any exceedance of the restriction on the hours of startup and shutdowns for this emissions unit (1199 hours).

5. The permittee shall submit quarterly deviation (excursion) reports that identify each time when this emissions unit was not in compliance with the start-up/shut-down restrictions specified under Section II.3, or when records were not maintained as required in Sections A.III.1 and A.III.3. These reports are due by the date described in Part I - General Terms and Conditions of this permit.

6. In lieu of the excess emissions reports required under 40 CFR Part 60.334, the permittee shall submit excess emissions reports for this emissions unit in accordance with this permit. These reports are due by the date described in Part I - General Terms and Conditions of this permit.

7. This emission unit is subject to the applicable provisions of Subpart Da and GG of the New Source Performance Standards (NSPS), as promulgated by the United States Environmental Protection Agency in 40 CFR Part 60. The application and enforcement of these standards are delegated to the Ohio EPA. The requirements of 40 CFR Part 60 are also federally enforceable.

Pursuant to 40 CFR Part 60.7, the permittee is hereby advised of the requirement to report the following at the appropriate times:

a. construction date (no later than 30 days after such date);

b. anticipated start-up date (not more than 60 days or less than 30 days prior to such date);

c. actual start-up date (within 15 days after such date); and,

d. date of performance testing (if required, at least 30 days prior to testing).

Reports are to be sent to :

Ohio Environmental Protection Agency
DAPC - Permit Management Unit
P.O. Box 163669
Columbus, Ohio 43216-3669

and

Portsmouth Local Air Agency
605 Washington Street, Third Floor
Portsmouth, Ohio 45662

V. Testing Requirements

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

a. The emission testing shall be conducted within 60 days after achieving the maximum production rate at which the emission unit will be operated, but not later than 180 days after initial startup of such emission unit.

b. The emission testing shall be conducted to demonstrate compliance with the NOx and CO outlet concentrations; the mass emission limitations for NOx*, CO, Formaldehyde, VOC, PE/$PM_{10,}$ and ammonia; and the pound per million Btu for PE/PM_{10} and VOC.

c. The following test method(s) shall be employed to demonstrate compliance with the above emission limitations: for NOx, Method 20 of 40 CFR Part 60, Appendix A; for PE/PM_{10}, Methods 201 and 202 of 40 CFR Part 60, Appendix A; for Formaldehyde, SW-846 Method 0011or EPA Method 316; for VOC, Method 25 of 40 CFR Part 60, Appendix A; for CO Method 10 of 40 CFR Part 60, Appendix A; and for ammonia, CTM-027. Alternative USEPA approved test methods may be used with prior approval from the Ohio EPA.

d. The testing shall be conducted while the emission unit is operating at or near its maximum capacity with and without duct burner firing and with power augmentation, unless otherwise specified or approved by Ohio EPA Central Office or Portsmouth Local Air Agency.

e. Not later than 30 days prior to the proposed test date(s), the permittee shall submit an "Intent to Test" notification to the Portsmouth Local Air Agency (or regulating agency). The "Intent to Test" notification shall describe in detail the proposed test methods and procedures, the emission unit operating parameters, the times(s) and date(s) of the test(s), and the person(s) who will be conducting these test(s). Failure to submit such notification for review and

approval prior to the tests may result in the Ohio EPA Central Office or Portsmouth Local Air Agency's refusal to accept the results of the emission test(s).

f. Personnel from Portsmouth Local Air Agency (or regulating agency) shall be permitted to witness the tests, 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.

g. A comprehensive written report on the results of the emission test(s) shall be signed by the person or persons responsible for the tests and submitted to the Portsmouth Local Air Agency (or regulating agency) 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 Portsmouth Local Air Agency (or regulating agency).

In lieu of the test methods and procedures required under 40 CFR Part 60.335, the permittee shall follow the testing requirements in accordance with this permit.

2. Within 60 days after achieving the maximum production rate at which the emission unit will be operated, but not later than 180 days after initial startup of such emissions unit, the permittee shall conduct certification tests of the continuous NOx, CO and O2 monitoring systems pursuant to ORC Section 3704.03(I), 40 CFR Part 60, Appendix B, Performance Specification 2, 3, 4, 6* and 40 CFR Part 75, unless an extension is granted by the Ohio EPA. Personnel from the Portsmouth Local Air Agency and Ohio EPA Central Office shall be notified 30 days prior to initiation of the applicable tests and shall be permitted to examine equipment and witness the certification tests. In accordance with OAC rule 3745-15-04, copies of all test results shall be submitted within 30 days after the test is completed. Copies of the test results shall be sent to the Portsmouth Local Air Agency (or regulating agency) and the Ohio EPA, Central Office. Certification of the continuous NOx, CO and O_2 CEMS/CERMS shall be granted upon determination by the Ohio EPA, Central Office that the system meets all requirements of the appropriate Sections of ORC Section 3704.03(I), 40 CFR Part 60, Appendix B, Performance Specification 2, 3, 4 and 6* and 40 CFR Part 75.

* The permittee may use certified NOx CEMS in conjunction with a fuel flow monitor as described in 40 CFR Part 75, and a certified CO CEMS in conjunction with a fuel flow monitor (in a manner similar to that used for NOx) to meet these requirements. The relative accuracy requirements of Performance Specification 6 shall apply in either case.

3. Compliance with the emission limitations in Section A.I.1 of these terms and conditions shall be determined in accordance with the following methods:

a. Emission Limitation:

NOx emissions shall not exceed:
3.0 ppmvd at 15% Oxygen
24.1 lbs/hr without duct burner firing
30.5 lbs/hr with duct burner firing
182.8 tons based on a 12 month rolling summation, which includes 67.5 tons for startups and shutdowns.

Applicable Compliance Method:

Initial compliance with the allowable outlet concentrations and the pound per hour emission limitations shall be demonstrated by the performance testing as described in Section A.V.1, and continual compliance with those limitations shall be demonstrated by the use of the CEMS and CERMS, as required in Section A.III.4. Monthly emissions shall be determined by the adding the hourly CERMS data at the end of each month. If at any time during the month the CERMS data is not available, the hours of start-up/shutdown emissions shall be determined as required in Section A.III.3 and the daily average CERMS data for the mode of operations (power augmentation, with or without duct burners etc.) will be added in place of the CERMS actual hourly average. At the end of each month the monthly emissions (required in Sections A.III.1 and A.III.2) shall be added to the previous 11 months to determine the total rolling 12-month emissions.

b. Emission Limitation:

Particulate emissions shall not exceed:
12.7 lbs/hr without duct burner firing
0.0061 lb/MMBtu without duct burner firing
25.3 lbs/hr with duct burner firing
0.0089 lb/MMBtu with duct burner firing
110.8 tons, based on a 12 month rolling summation

Applicable Compliance Method:

Compliance with the pound per hour and pound per MMBtu emission limitations shall be demonstrated by the performance testing in Section A.V.1. Monthly emissions shall be calculated by multiplying the hourly emissions rate, determined from the most recent stack test conducted to demonstrate compliance, by the actual annual hours of operation, as recorded in Section A.III.2. At the end of each month the monthly emissions (required in Section A.III.2) shall be added to the previous 11 months to determine the total rolling 12-month emissions.

c. Emission Limitation:

SO2 emissions shall not exceed:
11.9 lbs/hr without duct burner firing
16.1 lbs/hr with duct burner firing
0.0057 lb/MMBtu with and without duct burner firing
70.5 tons, based on a 12 month rolling summation.

Applicable Compliance Methods:

Compliance with the pound per hour and pound per MMBtu emission limitations shall be demonstrated by the recordkeeping required in Sections A.III.2, A.III.5, and A.III.6. Monthly emissions shall be calculated by multiplying the hourly emissions rate, by the actual annual hours of operation, as recorded in Section A.III.2. If required, compliance shall be demonstrated in accordance with the Method 6 of 40 CFR Part 60, Appendix A. At the end of each month the monthly emissions (required in Section A.III.2) shall be added to the previous 11 months to determine the total rolling 12-month emissions.

d. Emission Limitation:

VOC emissions shall not exceed
4.2 lbs/hr without duct burner firing
0.002 lb/MMBtu without duct burner firing
30.7 lbs/hr with duct burner firing
0.0108 lb/MMBtu with duct burner firing
148.5 tons, based on a 12 month rolling summation, which includes 32.9 tons for startups and shutdowns.

Applicable Compliance Method:

Initial compliance with the pound per hour and pound per MMBtu emission limitations shall be demonstrated by the performance testing as described in Section A.V.1. Monthly emissions shall be determined by multiplying the hourly emissions rate, as determined from the most recent stack test conducted to demonstrate compliance, by the actual hours of operation, as recorded in Section A.III.2, and adding the start-up/shutdown emissions, calculated from and maintained as required in Sections A.III.1 and A.III.3. At the end of each month the monthly emissions (required in Sections A.III.1 and A.III.2) shall be added to the previous 11 months to determine the total rolling 12-month emissions.

e. Emission Limitation:

CO emissions shall not exceed
2 ppmvd at 15 % oxygen when the turbine load is at or above 75% without duct burner firing or the use of power augmentation
10 ppmvd at 15 % oxygen without duct burner firing but with the use of power augmentation or when the turbine load is below 75%

10 ppmvd at 15% oxygen with duct burner firing
9.8 lbs/hr when the turbine load is at or above 75% without duct burner firing or the use of power augmentation
32.4 lbs/hr without duct burner firing but with the use of power augmentation or when the turbine load is below 75%
61.9 lbs/hr with duct burner firing and/or use of power augmentation
529.8 tons based on a 12 month rolling summation, which includes 298.8 tons for startups and shutdowns.
295.8 tons for startups and shutdowns, based on a 12 month rolling summation

Applicable Compliance Method:

Initial compliance with the allowable outlet concentrations and the pound per hour emission limitations shall be demonstrated by the performance testing as described in Section A.V.1, and continual compliance with those limitations shall be demonstrated by the use of the CEMS and CERMS, as required in Section A.III.4. Monthly emissions shall be determined by the adding the hourly CERMS data at the end of each month. If at any time during the month the CERMS data is not available, the hours of start-up/shutdown emissions shall be determined as required in Section A.III.3 and the daily average CERMS data for the mode of operations (power augmentation, with or without duct burners etc.) will be added in place of the CERMS actual hourly average. At the end of each month the monthly emissions (required in Sections A.III.1 and A.III.2) shall be added to the previous 11 months to determine the total rolling 12-month emissions.

f. Emission Limitation:

ammonia (NH3) emissions shall not exceed
27.3 lbs/hr without duct burner firing
37.7 lbs/hr with duct burner firing
165.1 tons per year

Applicable Compliance Method:

Compliance with the pound per hour emission limitations shall be demonstrated by the performance testing in Section A.V.1. Monthly emissions shall be calculated by multiplying the hourly emissions rate, determined from the most recent stack test conducted to demonstrate compliance, by the actual annual hours of operation, as recorded in Section A.III.2. Compliance with the annual emission limitation shall be demonstrated at the end of each year by adding the monthly records maintained in Section A.III.2.

g. Emission Limitation:

Formaldehyde emission shall not exceed
0.75 lb/hr without duct burner firing
1.02 lbs/hr with duct burner firing
4.47 TPY

Applicable Compliance Method:

Compliance with the pound per hour emission limitations shall be demonstrated by the performance testing in Section A.V.1. Monthly emissions shall be calculated by multiplying the hourly emissions rate, determined from the most recent stack test conducted to demonstrate compliance, by the actual annual hours of operation, as recorded in Section A.III.2. Compliance with the annual emission limitation shall be demonstrated at the end of each year by adding the monthly records maintained in Section A.III.2.

h. Emission Limitation:

Sulfuric acid (H2SO4) emissions shall not exceed
2.72 lbs/hr without duct burner firing
3.71 lbs/hr with duct burner firing
16.2 tons based on a 12 month rolling summation
0.0013 lb/MMBtu with and without duct burner firing

Applicable Compliance Method:

Compliance with the pound per hour and pound per MMBtu emission limitations shall be demonstrated by the recordkeeping required in Sections A.III.2, A.III.5, and A.III.6 for the pollutant SO_2. It is estimated (by the permittee) that approximately 15% of the SO_2 emissions are converted to sulfuric acid. Monthly emissions shall be calculated by the multiplying the hourly emissions rate determined for SO_2 by 15%, and this hourly rate by the actual annual hours of operation, as recorded in Section A.III.2. At the end of each month the monthly emissions (required in Section A.III.2) shall be added to the previous 11 months to determine the total rolling 12-month emissions.

i. Emission Limitation:

Visible particulate emissions from any stack shall not exceed 10 percent opacity as a six minute average.

Applicable Compliance Method:

If required, compliance shall be demonstrated in accordance with the requirements specified in OAC rule 3745-17-03(B)(1) determined according to Method 9 of 40 CFR Part 60, Appendix A.

VI. Miscellaneous Requirements

1. In accordance with good engineering practices, the SCR unit on emissions unit P001 shall be installed, operated and maintained in accordance with the manufacturer's recommendations, with any modifications deemed necessary by the permittee. The permittee shall maintain on site a copy of the operation & maintenance manual, as provided by the manufacturer.

2. Prior to the installation of the continuous NO_x and CO monitoring systems, the permittee shall submit information detailing the proposed location of the sampling site in accordance with the siting requirements in 40 CFR Part 60, Appendix B, Performance Specification 2, 4 and 6* (or as described in condition A.V.1.) for approval by the Ohio EPA, Central Office.

* for Performance Specification 6 see Section V.2.

3. Within 180 days of the effective date of this permit, the permittee shall develop a written quality assurance/quality control plan for the continuous NOx, CO, and O_2 monitoring system designed to ensure continuous valid and representative readings of NOx, CO, and O_2 emissions in units of the applicable standard. The plan shall follow the requirements of the appropriate Sections of 40 CFR Part 60, Appendix F and 40 CFR Part 75, Appendix B, or as approved by the Ohio EPA, Central Office. The quality assurance/quality control plan and logbook dedicated to the continuous NOx, CO, and O_2 monitoring system must be kept on site and available for inspection during regular office hours.

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.

Operations, Property, and/or Equipment	Applicable Rules/Requirements	Applicable Emissions Limitations/Control Measures
P002 - 180 MW Westinghouse 501F natural gas fired combustion turbine No 2 with duct firing operating in combined cycle mode controlled by selective catalytic reduction (SCR) and oxidation catalyst	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

None

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.

Operations, Property, and/or Equipment	Applicable Rules/Requirements	Applicable Emissions Limitations/Control Measures
P003 - 180 MW Westinghouse 501F natural gas fired combustion turbine No 3 with duct firing during combined cycle mode controlled by selective catalytic reduction (SCR) and oxidation catalyst	40 CFR 52.21 and OAC rule 3745-31-(10) thru (20)	EMISSION LIMITS WITHOUT DUCT BURNER FIRING: Nitrogen oxides (NO_x) emissions shall not exceed 3.0 ppmvd at 15% Oxygen NOx emissions shall not exceed 24.1 lbs/hr. Particulate emissions (PE/PM_{10}*) shall not exceed 0.0061 lb/MMBtu and 12.7 lbs/hr. Sulfur dioxide (SO_2) emissions shall not exceed 0.0057 lb/MMBtu and 11.9 lbs/hr. Carbon monoxide (CO) emissions shall not exceed the following: 2.0 ppmvd at 15% oxygen (when turbine load is at or above 75% without power augmentation) 10 ppmv at 15% oxygen (with power augmentation or when turbine load is below 75%) CO emissions shall not exceed 9.8 lbs/hr when turbine load is at or above 75 % without power augmentation or 32.4 lbs/hr with power augmentation** or when turbine load is below 75%

Volatile organic compounds (VOC) emissions shall not exceed 0.002 lb/MMBtu and 4.2 lbs/hr.

Sulfuric acid (H_2SO_4) emissions shall not exceed 0.0013 lb/MMBtu and 2.72 lbs/hr.

EMISSION LIMITS WITH DUCT BURNER FIRING:

NO_x emissions shall not exceed 3.0 ppmvd at 15% Oxygen

NOx emissions shall not exceed 30.5 lbs/hr.

Particulate emissions (PE/PM_{10}) shall not exceed 0.0089 lb/MMBtu and 25.3 lbs/hr.

SO_2 emissions shall not exceed 0.0057 lb/MMBtu and 16.1 lbs/hr.

CO emissions shall not exceed 10 ppmvd at 15% Oxygen.

CO emissions shall not exceed 61.9 lbs/hr.

VOC emissions shall not exceed 0.0108 lb/MMBtu and 30.7 lbs/hr.

H_2SO_4 emissions shall not exceed 0.0013 lb/MMBtu and 3.71 lbs/hr.

STARTUP AND SHUTDOWN EMISSIONS (see Item A.II.3.):

NO_x emissions shall not exceed 67.5 tons, based on a 12 month rolling average.

CO emissions shall not exceed 295.8 tons, based on a 12 month rolling average.

		VOC emissions shall not exceed 32.4 tons, based on a 12 month rolling average. TOTAL TONS per rolling 12 months including startups and shutdowns: NO_x emissions shall not exceed 182.8 tons, based on a 12 month rolling average. SO_2 emissions shall not exceed 70.5 tons, based on a 12 month rolling average. PE/PM_{10} emissions shall not exceed 110.8 tons, based on a 12 month rolling average. CO emissions shall not exceed 529.8 tons, based on a 12 month rolling average. VOC emissions shall not exceed 148.5 tons, based on a 12 month rolling average. H_2SO_4 emissions shall not exceed 16.2 tons, based on a 12 month rolling average. see Section A.I.2.f below.
	OAC rule 3745-31-05(A)(3)	The requirements of this rule also include compliance with the requirements of 40 CFR 60 Subpart Da and GG, OAC rule 3745-18-06(F), 3745-17-11(B)(4), OAC rule 3745-17-07(A), 40 CFR 52.21, and OAC 3745-31- (10) thru (20). Visible particulate emissions shall not exceed 10 % opacity as a six minute average. Ammonia (NH_3) emissions shall not exceed 165.1 tpy.

	Formaldehyde shall not exceed 4.47 tpy. EMISSION LIMITS WITHOUT DUCT BURNER FIRING: NH_3 emissions shall not exceed 27.3 lbs/hr. Formaldehyde emissions shall not exceed 0.75 lb/hr. EMISSION LIMITS WITH DUCT BURNER FIRING: NH_3 emissions shall not exceed 37.7 lbs/hr. Formaldehyde emissions shall not exceed 1.02 lbs/hr.
40 CFR part 60, Subpart GG	see Sections A.I.2.b and A.III.6 below.
40 CFR part 60, Subpart Da	see Section A.I.2.c below.
OAC rule 3745-18-06(F)	see Section A.I.2.a below.
OAC rule 3745-17-11(B)(4)	see Section A.I.2.a below.
OAC rule 3745-17-07(A)	see Section A.I.2.a below.
40 CFR Part 63, Subpart YYYY	see Section A.I.2.e below.
40 CFR Part 75	see Section A.I.2.d below.
OAC rule 3745-103	see Section A.I.2.d below.
	* all particulate emission are assumed to be PM_{10} ** power augmentation is when steam from the heat recovery steam generator is injected into the combustion turbine generator

2. Additional Terms and Conditions

2.a The emissions limit based on this applicable rule is equivalent to or less stringent than the limit established pursuant to 40 CFR 52.21 and OAC rule 3745-31-(10) through (20)**.**

2.b The emissions limits based on this standard are less stringent than the limits established pursuant to 40 CFR 52.21 and OAC rule 3745-31-(10) thru (20). The limit contained in this permit is more stringent that the limit calculated per CFR 60.332 for nitrogen oxides, using the manufacturer's heat rate at the manufacturer's rated load for "Y". The SO_2 limit contained in this permit, 2 grains SO_2/100scf, is more restrictive than required per CFR 60.333. Except as provided for in the terms and conditions in this permit, the permittee is not exempt from meeting any additional requirements of 40 CFR Part 60, Subpart GG.

2.c The particulate and visible emissions limits contained in this permit are more stringent than the limits established pursuant to 40 CFR Part 60, Subpart Da, in 60.42(a) and 60.42(b) respectively. And the 30-day rolling average limits, established per CFR 60.43(b) for sulfur dioxide emissions and per CFR 60.44(a) for nitrogen oxide emissions, are less stringent than the emissions limits contained in this permit, which are also established as hourly limits.

2.d The permittee is subject to the applicable requirements of 40 CFR Parts 72, 73, 74, 75, and 76, concerning the acid rain program. Per 40 CFR 72.30(b)(2)(ii) and OAC 3745-103-07(A)(2)(b) and (c), an application for a Part 72 permit shall be submitted at least 24 months prior to commencing operations. Emissions exceeding any allowances that are lawfully held under Title IV of the Act, or any regulations adopted thereunder, are prohibited.

2.e Upon promulgation, the permittee shall comply with the requirements of 40 CFR Part 63, Subpart YYYY, National Emissions Standards for Hazardous Air Pollutants (NESHAP) for Combustion Turbines.

2.f The permittee is required to perform Best Available Control Technology (BACT) review for NOx, SO_2, CO, PM_{10}, H_2SO_4 and VOC. The emissions limits based on the BACT requirements are listed under 40 CFR 52.21 and OAC rule 3745-31-(10) through (20) above. The following determinations have been made for each pollutant:

PE/PM_{10}-Burning natural gas in an efficient combustion turbine. For this permit, it is assumed that all PE emissions are PM_{10}.

NOx- Use of DLN burners and employment of SCR with a controlled emissions rate of 3.0 ppmvd at 15% oxygen.

CO- Use of oxidation catalyst with an emissions rate of 2.0 ppmvd at 15% oxygen without duct firing or use of power augmentation at greater than 75% load and 10 ppmvd at 15% oxygen with duct firing and use of power augmentation including operational periods of 60 - 75% load.

VOC- Combustion controls and use of an oxidation catalyst.

SO_2- Burning natural gas in an efficient combustion turbine and burning low sulfur fuel.

H_2SO_4-Burning natural gas in an efficient combustion turbine.

II. Operational Restrictions

1. The permittee shall burn only natural gas in this emissions unit. The maximum sulfur content of the natural gas shall not exceed 2 grains per 100 standard cubic feet.

2. The permittee shall be limited to 1199 hours of operation per year for startups and shutdowns for this emissions unit.

3. As specified in the permittee's PTI application, the maximum heat input rating of this emissions unit is 2830 MM Btu/hr. This value corresponds to a maximum natural gas fuel flow of 2.830 million scf/hr, with a lower heat value of 1000 MMBtu/million scf. The permittee shall operate this emissions unit within the parameters specified above, except for startup* and shutdown. Start-up and shut-down periods shall be defined as any time the unit is operating at less than 60 % load. A cold startup is one that occurs more than 12 hours after shutdown. A hot startup is one that occurs 12 hours or less after shutdown. Typically, cold startup periods will be 4.0 hours in duration and hot startup periods 2.0 hours in duration, and shut-down periods 1.0 hour in duration. Each startup and shutdown shall be limited to the following:

Pollutant	lbs/cold startup	lbs/hot startup	lbs/shutdown
NOx	497	256	79
CO	1777	935	565
VOC	163	87	80

*Startup for testing purposes shall be defined as the date when emission unit P001 is set in operation for any purpose.

4. The SCR system shall be in operation at all times, except for periods of startup and shutdown, defined as any time unit is operating at less than 60% load.

III. Monitoring and/or Recordkeeping Requirements

1. The permittee shall maintain monthly records of the following information for this emissions unit:

a. number and duration of each cold and hot start-up;
b. number and duration of each shut-down; and
c. the start-up and shut-down emissions* for NOx, CO, and VOC in tons per month.

* The start-up and shut-down emissions shall be based on CEM data, if available. If CEM data is not available, the emissions for each start-up and shut-down shall be based on the pound per event values specified in Section A.II.3, prorated by the actual duration of the event, as recorded per Section A.III.3 below.

2. The permittee shall maintain monthly records of the following information for this emissions unit:

a. the natural gas usage rate for each month (in standard cubic feet);
b. the hours of operation for the combustion turbine;
c. the hours of operation for the duct burner;
d. the monthly emissions for PE/PM_{10}, NOx, SO2, CO, VOC, formaldehyde, ammonia, and H_2SO_4, in tons; and
e. the rolling, 12-month summation of the emissions for PE/PM_{10}, NOx, SO2, CO, VOC, and H_2SO_4 (including start-up and shut-down emissions), in tons.

At the end of each year the permittee shall calculate the annual emissions from each of the pollutants above, in order to fulfill annual reporting requirements.

3. The permittee shall maintain records of the duration of each start-up and shut-down if continuous emissions monitoring system (CEMS) data is not available to document the duration of each event as required in Section A.III.1.

4. The permittee shall install, operate, maintain and certify continuous emissions monitoring system (CEMS) and continuous emissions rate monitoring system (CERMS) equipment to continuously monitor and record NO_x* ,CO, and O_2 from this emissions unit in the units of the standards established in this permit. Such continuous monitoring and recording equipment shall comply with the requirements specified in 40 CFR Part 60.13 and 40 CFR Part 75, or as approved in writing by the Ohio EPA, Central Office for this emissions unit.

The permittee shall maintain records of all data obtained by the continuous NO_x, CO, and O_2 monitoring systems including, but not limited to: results of daily zero/span calibration checks; magnitude of manual calibration adjustments; parts per million NO_x, CO, and per cent O_2 on an instantaneous (one-minute) basis; and emissions of NO_x and CO in pounds per million Btu and pounds per hour, in one-hour averages.

In conjunction with the operation of the NOx and CO CEMS and CERMS, the permittee shall install, operate and maintain a system to monitor when the duct burners are being fired. The data measured by this system shall be compiled with the data recorded by the NOx and CO CEMS and CERMS.

* The installation and operation of systems to continuously monitor and record emissions of NOx may be performed in lieu of monitoring the nitrogen content of the fuels being fired in the turbine, as required by 40 CFR 60.334(b).

5. The permittee shall install, operate, maintain and certify equipment to continuously monitor and record the actual fuel flow to the turbine and duct burner when the turbine is in operation. Such continuous monitoring and recording equipment shall comply with the requirements specified in 40 CFR Part 75. If the fuel flow monitoring and/or recording equipment is (are) not in service when the emissions unit is in operation, the permittee shall comply with the appropriate missing data procedures specified in 40 CFR Part 75, Subparts D and E. The permittee shall maintain an

information management system for this emissions unit capable of monitoring and recording the fuel flow (million cubic feet) to the turbine and to the duct burner, hours of operation with duct burner firing, and hours of operation without duct burner firing.

6. The permittee shall maintain documentation on the sulfur contents and heating values of the fuel received. ASTM D 1072-80, D 3031-81, D 4084-82, or D 3246-81 shall be used for the sulfur content of gaseous fuels. The permittee shall determine the heat value of the fuel using ASTM method D240. The applicable ranges of some ASTM methods mentioned above are not adequate to measure the levels of sulfur in some fuel gases. Dilution of samples before analysis (with verification of the dilution ratio) may be used, subject to the approval of the Ohio EPA. The newest or most recent revisions to the applicable test method shall be used for these analyses. Fuel sampling and analysis shall be conducted according to the procedures and at the frequency specified by 40 CFR Part 75, Appendix D.

7. The permittee shall determine the hourly heat input rate to the combustion turbine and duct burner from the fuel flow rate as determined in term Section A.III.5, and gross calorific value as determined in term A.III.6. The heat input rate shall be calculated in accordance with the procedures in 40 CFR Part 75, Appendix F, Section 5.

8. Initial compliance with the permit limits shall be demonstrated through the testing requirements found in Section A.V.1. On-going compliance with permit limits for NOx and CO will be demonstrated with CEMS/CERMS, and associated recordkeeping.

IV. Reporting Requirements

1. The permittee shall submit deviation (excursion) reports that identify each day when a fuel other than natural gas was burned in this emission unit. Each report shall be submitted within 30 days after the deviation occurred.

2. Pursuant to OAC rules 3745-15-04, 3745-35-02, and ORC Sections 3704.03(I) and 3704.03(l) and 40 CFR Part 60.7 and 60.13 (h), the permittee shall submit reports within 30 days following the end of each calendar quarter to the Portsmouth Local Air Agency (or regulating agency) documenting the date, commencement and completion times, duration, magnitude, reason (if known), and corrective actions taken (if any), of all instances of NOx or CO values, as recorded by the CEMS, in excess of the applicable limits specified in the terms and conditions of this permit. These reports shall also contain the total NOx and CO emissions for the calendar quarter (in tons).

The permittee shall submit reports within 30 days following the end of each calendar quarter to the Portsmouth Local Air Agency (or regulating agency) documenting any continuous NOx, CO, or O_2 monitoring system down time while the emission unit was on line (date, time, duration and reason) along with any corrective action(s) taken. The permittee shall provide the emission unit operating time during the reporting period and the date, time, reason and corrective action(s) taken for each time period of emission unit and control equipment malfunctions. The total operating time of the emissions unit and the total operating time of the analyzer, while the emission unit was on line, shall also be included in the quarterly report. These quarterly excess emission reports shall be submitted

by January 30, April 30, July30, and October 30 of each year and shall address the data obtained during the previous calendar quarter.

If there are no excess emissions during the calendar quarter, the permittee shall submit a statement to that effect along with the emissions unit operating time during the reporting period and the date, time, reason, and corrective action(s) taken for each time period of emission unit, control equipment, and/or monitoring system malfunctions. The total operating time of the emission unit and the total operating time of the analyzer while the emission unit was on line also shall be included in the quarterly report. These quarterly excess emission reports shall be submitted by January 30, April 30, July 30, and October 30 of each year and shall address the data obtained during the previous calendar quarter.

Pursuant to OAC rules 3745-15-04, 3745-35-02, and ORC Sections 3704.03(I) and 3704.031, the permittee shall submit a summary of the excess emission report pursuant to 40 CFR Part 60.7. The summary shall be submitted to the Portsmouth Local Air Agency (or regulating agency) within 30 days following the end of each calendar quarter in a manner prescribed by the Director

3. The permittee shall submit quarterly deviation (excursion) reports that identify any record which shows that the sulfur content of the natural gas exceeded 2 grains per 100 standard cubic feet. These reports are due by the date described in Part I - General Terms and Conditions of this permit under Section (A)(2).

4. The permittee shall submit annual deviation (excursion) reports, by February 1 of each year, that identify any exceedance of the restriction on the hours of startup and shutdowns for this emissions unit (1199 hours).

5. The permittee shall submit quarterly deviation (excursion) reports that identify each time when this emissions unit was not in compliance with the start-up/shut-down restrictions specified under Section II.3, or when records were not maintained as required in Sections A.III.1 and A.III.3. These reports are due by the date described in Part I - General Terms and Conditions of this permit.

6. In lieu of the excess emissions reports required under 40 CFR Part 60.334, the permittee shall submit excess emissions reports for this emissions unit in accordance with this permit. These reports are due by the date described in Part I - General Terms and Conditions of this permit.

7. This emission unit is subject to the applicable provisions of Subpart Da and GG of the New Source Performance Standards (NSPS), as promulgated by the United States Environmental Protection Agency in 40 CFR Part 60. The application and enforcement of these standards are delegated to the Ohio EPA. The requirements of 40 CFR Part 60 are also federally enforceable.

Pursuant to 40 CFR Part 60.7, the permittee is hereby advised of the requirement to report the following at the appropriate times:

a. construction date (no later than 30 days after such date);

b. anticipated start-up date (not more than 60 days or less than 30 days prior to such date);

c. actual start-up date (within 15 days after such date); and,

d. date of performance testing (if required, at least 30 days prior to testing).

Reports are to be sent to :

Ohio Environmental Protection Agency
DAPC - Permit Management Unit
P.O. Box 163669
Columbus, Ohio 43216-3669

and

Portsmouth Local Air Agency
605 Washington Street, Third Floor
Portsmouth, Ohio 45662

V. Testing Requirements

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

a. The emission testing shall be conducted within 60 days after achieving the maximum production rate at which the emission unit will be operated, but not later than 180 days after initial startup of such emission unit.

b. The emission testing shall be conducted to demonstrate compliance with the NOx and CO outlet concentrations; the mass emission limitations for NOx*, CO, Formaldehyde, VOC, PE/$PM_{10,}$ and ammonia; and the pound per million Btu for PE/PM_{10} and VOC.

c. The following test method(s) shall be employed to demonstrate compliance with the above emission limitations: for NOx, Method 20 of 40 CFR Part 60, Appendix A; for PE/PM_{10}, Methods 201 and 202 of 40 CFR Part 60, Appendix A; for Formaldehyde, SW-846 Method 0011or EPA Method 316; for VOC, Method 25 of 40 CFR Part 60, Appendix A; for CO Method 10 of 40 CFR Part 60, Appendix A; and for ammonia, CTM-027. Alternative USEPA approved test methods may be used with prior approval from the Ohio EPA.

d. The testing shall be conducted while the emission unit is operating at or near its maximum capacity with and without duct burner firing and with power augmentation, unless otherwise specified or approved by Ohio EPA Central Office or Portsmouth Local Air Agency.

e. Not later than 30 days prior to the proposed test date(s), the permittee shall submit an "Intent to Test" notification to the Portsmouth Local Air Agency (or regulating agency). The "Intent to Test" notification shall describe in detail the proposed test methods and procedures, the emission unit operating parameters, the times(s) and date(s) of the test(s), and the person(s) who will be conducting these test(s). Failure to submit such notification for review and

approval prior to the tests may result in the Ohio EPA Central Office or Portsmouth Local Air Agency's refusal to accept the results of the emission test(s).

f. Personnel from Portsmouth Local Air Agency (or regulating agency) shall be permitted to witness the tests, 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.

g. A comprehensive written report on the results of the emission test(s) shall be signed by the person or persons responsible for the tests and submitted to the Portsmouth Local Air Agency (or regulating agency) 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 Portsmouth Local Air Agency (or regulating agency).

In lieu of the test methods and procedures required under 40 CFR Part 60.335, the permittee shall follow the testing requirements in accordance with this permit.

2. Within 60 days after achieving the maximum production rate at which the emission unit will be operated, but not later than 180 days after initial startup of such emissions unit, the permittee shall conduct certification tests of the continuous NOx, CO and O2 monitoring systems pursuant to ORC Section 3704.03(I), 40 CFR Part 60, Appendix B, Performance Specification 2, 3, 4, 6* and 40 CFR Part 75, unless an extension is granted by the Ohio EPA. Personnel from the Portsmouth Local Air Agency and Ohio EPA Central Office shall be notified 30 days prior to initiation of the applicable tests and shall be permitted to examine equipment and witness the certification tests. In accordance with OAC rule 3745-15-04, copies of all test results shall be submitted within 30 days after the test is completed. Copies of the test results shall be sent to the Portsmouth Local Air Agency (or regulating agency) and the Ohio EPA, Central Office. Certification of the continuous NOx, CO and O_2 CEMS/CERMS shall be granted upon determination by the Ohio EPA, Central Office that the system meets all requirements of the appropriate Sections of ORC Section 3704.03(I), 40 CFR Part 60, Appendix B, Performance Specification 2, 3, 4 and 6* and 40 CFR Part 75.

* The permittee may use certified NOx CEMS in conjunction with a fuel flow monitor as described in 40 CFR Part 75, and a certified CO CEMS in conjunction with a fuel flow monitor (in a manner similar to that used for NOx) to meet these requirements. The relative accuracy requirements of Performance Specification 6 shall apply in either case.

3. Compliance with the emission limitations in Section A.I.1 of these terms and conditions shall be determined in accordance with the following methods:

a. Emission Limitation:

NOx emissions shall not exceed:
3.0 ppmvd at 15% Oxygen
24.1 lbs/hr without duct burner firing
30.5 lbs/hr with duct burner firing
182.8 tons based on a 12 month rolling summation, which includes 67.5 tons for startups and shutdowns.

Applicable Compliance Method:

Initial compliance with the allowable outlet concentrations and the pound per hour emission limitations shall be demonstrated by the performance testing as described in Section A.V.1, and continual compliance with those limitations shall be demonstrated by the use of the CEMS and CERMS, as required in Section A.III.4. Monthly emissions shall be determined by the adding the hourly CERMS data at the end of each month. If at any time during the month the CERMS data is not available, the hours of start-up/shutdown emissions shall be determined as required in Section A.III.3 and the daily average CERMS data for the mode of operations (power augmentation, with or without duct burners etc.) will be added in place of the CERMS actual hourly average. At the end of each month the monthly emissions (required in Sections A.III.1 and A.III.2) shall be added to the previous 11 months to determine the total rolling 12-month emissions.

b. Emission Limitation:

Particulate emissions shall not exceed:
12.7 lbs/hr without duct burner firing
0.0061 lb/MMBtu without duct burner firing
25.3 lbs/hr with duct burner firing
0.0089 lb/MMBtu with duct burner firing
110.8 tons, based on a 12 month rolling summation

Applicable Compliance Method:

Compliance with the pound per hour and pound per MMBtu emission limitations shall be demonstrated by the performance testing in Section A.V.1. Monthly emissions shall be calculated by multiplying the hourly emissions rate, determined from the most recent stack test conducted to demonstrate compliance, by the actual annual hours of operation, as recorded in Section A.III.2. At the end of each month the monthly emissions (required in Section A.III.2) shall be added to the previous 11 months to determine the total rolling 12-month emissions.

c. Emission Limitation:

SO2 emissions shall not exceed:
11.9 lbs/hr without duct burner firing
16.1 lbs/hr with duct burner firing
0.0057 lb/MMBtu with and without duct burner firing
70.5 tons, based on a 12 month rolling summation.

Applicable Compliance Methods:

Compliance with the pound per hour and pound per MMBtu emission limitations shall be demonstrated by the recordkeeping required in Sections A.III.2, A.III.5, and A.III.6. Monthly emissions shall be calculated by multiplying the hourly emissions rate, by the actual annual hours of operation, as recorded in Section A.III.2. If required, compliance shall be demonstrated in accordance with the Method 6 of 40 CFR Part 60, Appendix A. At the end of each month the monthly emissions (required in Section A.III.2) shall be added to the previous 11 months to determine the total rolling 12-month emissions.

d. Emission Limitation:

VOC emissions shall not exceed
4.2 lbs/hr without duct burner firing
0.002 lb/MMBtu without duct burner firing
30.7 lbs/hr with duct burner firing
0.0108 lb/MMBtu with duct burner firing
148.5 tons, based on a 12 month rolling summation, which includes 32.9 tons for startups and shutdowns.

Applicable Compliance Method:

Initial compliance with the pound per hour and pound per MMBtu emission limitations shall be demonstrated by the performance testing as described in Section A.V.1. Monthly emissions shall be determined by multiplying the hourly emissions rate, as determined from the most recent stack test conducted to demonstrate compliance, by the actual hours of operation, as recorded in Section A.III.2, and adding the start-up/shutdown emissions, calculated from and maintained as required in Sections A.III.1 and A.III.3. At the end of each month the monthly emissions (required in Sections A.III.1 and A.III.2) shall be added to the previous 11 months to determine the total rolling 12-month emissions.

e. Emission Limitation:

CO emissions shall not exceed
2 ppmvd at 15 % oxygen when the turbine load is at or above 75% without duct burner firing or the use of power augmentation

10 ppmvd at 15 % oxygen without duct burner firing but with the use of power augmentation or when the turbine load is below 75%
10 ppmvd at 15% oxygen with duct burner firing
9.8 lbs/hr when the turbine load is at or above 75% without duct burner firing or the use of power augmentation
32.4 lbs/hr without duct burner firing but with the use of power augmentation or when the turbine load is below 75%
61.9 lbs/hr with duct burner firing and/or use of power augmentation
529.8 tons based on a 12 month rolling summation, which includes 298.8 tons for startups and shutdowns.
295.8 tons for startups and shutdowns, based on a 12 month rolling summation

Applicable Compliance Method:

Initial compliance with the allowable outlet concentrations and the pound per hour emission limitations shall be demonstrated by the performance testing as described in Section A.V.1, and continual compliance with those limitations shall be demonstrated by the use of the CEMS and CERMS, as required in Section A.III.4. Monthly emissions shall be determined by the adding the hourly CERMS data at the end of each month. If at any time during the month the CERMS data is not available, the hours of start-up/shutdown emissions shall be determined as required in Section A.III.3 and the daily average CERMS data for the mode of operations (power augmentation, with or without duct burners etc.) will be added in place of the CERMS actual hourly average. At the end of each month the monthly emissions (required in Sections A.III.1 and A.III.2) shall be added to the previous 11 months to determine the total rolling 12-month emissions.

f. Emission Limitation:

ammonia (NH3) emissions shall not exceed
27.3 lbs/hr without duct burner firing
37.7 lbs/hr with duct burner firing
165.1 tons per year

Applicable Compliance Method:

Compliance with the pound per hour emission limitations shall be demonstrated by the performance testing in Section A.V.1. Monthly emissions shall be calculated by multiplying the hourly emissions rate, determined from the most recent stack test conducted to demonstrate compliance, by the actual annual hours of operation, as recorded in Section A.III.2. Compliance with the annual emission limitation shall be demonstrated at the end of each year by adding the monthly records maintained in Section A.III.2.

g. Emission Limitation:

Formaldehyde emission shall not exceed
0.75 lb/hr without duct burner firing
1.02 lbs/hr with duct burner firing
4.47 TPY

Applicable Compliance Method:

Compliance with the pound per hour emission limitations shall be demonstrated by the performance testing in Section A.V.1. Monthly emissions shall be calculated by multiplying the hourly emissions rate, determined from the most recent stack test conducted to demonstrate compliance, by the actual annual hours of operation, as recorded in Section A.III.2. Compliance with the annual emission limitation shall be demonstrated at the end of each year by adding the monthly records maintained in Section A.III.2.

h. Emission Limitation:

Sulfuric acid (H2SO4) emissions shall not exceed
2.72 lbs/hr without duct burner firing
3.71 lbs/hr with duct burner firing
16.2 tons based on a 12 month rolling summation
0.0013 lb/MMBtu with and without duct burner firing

Applicable Compliance Method:

Compliance with the pound per hour and pound per MMBtu emission limitations shall be demonstrated by the recordkeeping required in Sections A.III.2, A.III.5, and A.III.6 for the pollutant SO_2. It is estimated (by the permittee) that approximately 15% of the SO_2 emissions are converted to sulfuric acid. Monthly emissions shall be calculated by the multiplying the hourly emissions rate determined for SO_2 by 15%, and this hourly rate by the actual annual hours of operation, as recorded in Section A.III.2. At the end of each month the monthly emissions (required in Section A.III.2) shall be added to the previous 11 months to determine the total rolling 12-month emissions.

i. Emission Limitation:

Visible particulate emissions from any stack shall not exceed 10 percent opacity as a six minute average.

Applicable Compliance Method:

If required, compliance shall be demonstrated in accordance with the requirements specified in OAC rule 3745-17-03(B)(1) determined according to Method 9 of 40 CFR Part 60, Appendix A.

VI. Miscellaneous Requirements

1. In accordance with good engineering practices, the SCR unit on emissions unit P001 shall be installed, operated and maintained in accordance with the manufacturer's recommendations, with any modifications deemed necessary by the permittee. The permittee shall maintain on site a copy of the operation & maintenance manual, as provided by the manufacturer.

2. Prior to the installation of the continuous NO_x and CO monitoring systems, the permittee shall submit information detailing the proposed location of the sampling site in accordance with the siting requirements in 40 CFR Part 60, Appendix B, Performance Specification 2, 4 and 6* (or as described in condition A.V.1.) for approval by the Ohio EPA, Central Office.

* for Performance Specification 6 see Section V.2.

3. Within 180 days of the effective date of this permit, the permittee shall develop a written quality assurance/quality control plan for the continuous NOx, CO, and O_2 monitoring system designed to ensure continuous valid and representative readings of NOx, CO, and O_2 emissions in units of the applicable standard. The plan shall follow the requirements of the appropriate Sections of 40 CFR Part 60, Appendix F and 40 CFR Part 75, Appendix B, or as approved by the Ohio EPA, Central Office. The quality assurance/quality control plan and logbook dedicated to the continuous NOx, CO, and O_2 monitoring system must be kept on site and available for inspection during regular office hours.

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.

Operations, Property, and/or Equipment	Applicable Rules/Requirements	Applicable Emissions Limitations/Control Measures
P003 - 180 MW Westinghouse 501F natural gas fired combustion turbine No 3 with duct firing during combined cycle mode controlled by selective catalytic reduction (SCR) and oxidation catalyst	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

None

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.

Operations, Property, and/or Equipment	Applicable Rules/Requirements	Applicable Emissions Limitations/Control Measures
P004 - 22 cell mechanical draft cooling tower	40 CFR 52.21 and OAC rule 3745-31-(10) through(20)	Particulate (PE/PM_{10}) emissions shall not exceed 1.69 lb/hr and 7.40 tpy. See section A.I.2.a below.
	OAC rule 3745-31-05 (A)(3)	See A.I.2.b below.
	OAC rule 3745-17-11 (B)(4)	See A.I.2.c below.
	OAC rule 3745-17-07 (A)(1)	Visible particulate emissions shall not exceed 20 percent opacity as a six-minute average, except as provided by rule.

2. Additional Terms and Conditions

2.a Per the requirements of 40 CFR 52.21, the permittee is required to perform a Best Available Control Technology (BACT) review for PM/PM_{10}. The implementation of high efficiency drift eliminators constitute BACT for this emissions unit.

2.b The requirements of this rule also include compliance with the requirements of OAC rule 3745-31-10 through 20, OAC rule 3745-17-07 (A)(1), and 40 CFR Part 52.21.

2.c The emissions limit based on this applicable rule is less stringent than the limit established pursuant to OAC rule 3745-31-05(A)(3).

II. Operational Restrictions

1. The permittee shall maintain an average total dissolved solids content of 2,500 ppm or less in this emissions unit.

III. Monitoring and/or Recordkeeping Requirements

1. The permittee shall perform the following monitoring requirements for this emissions unit on a monthly basis:

    1. test and record the total dissolved solids content; and

    2. determine the average dissolved solids content based on a rolling 12 month average.

IV. Reporting Requirements

1. The permittee shall submit deviation reports in accordance with the general terms and conditions of this permit that identify any exceedances of the average total dissolved solids content.

V. Testing Requirements

1. Compliance with the allowable emission limitations in section A.I.1. of these terms and conditions shall be determined in accordance with the following methods:

    a. Emission Limitation:

    particulate (PE/PM_{10}) emissions shall not exceed 1.69 lb/hr and 7.40 tpy.

    Applicable Compliance Method:

    Compliance with the lbs/hr emission limitation shall be demonstrated by applying the maximum drift loss factor 0.0005 percent to the maximum average total dissolved solids content of 2,500 ppm for the cooling water. If required, the permittee shall submit a testing proposal which will demonstrate that the maximum drift loss does not exceed 0.0005 percent. Compliance with the annual emission limitation shall be demonstrated by the multiplying the hourly emission rate by 8760 hours and dividing by 2000 lbs/ton.

    b. Emission Limitation:

    Visible particulate emissions shall not exceed 20 percent opacity as a six-minute average, except as provided by rule

    Applicable Compliance Method:

    Compliance with the visible emissions limitations established by this permit shall be determined by OAC rule 3745-17-03(B)(10).

VI. Miscellaneous Requirements

None

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.

Operations, Property, and/or Equipment	Applicable Rules/Requirements	Applicable Emissions Limitations/Control Measures
P004 - 22 cell mechanical draft cooling tower	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

None

NEW SOURCE REVIEW FORM B

PTI Number: 07-00505 Facility ID: 0744000151

FACILITY NAME Lawrence Energy Center

FACILITY DESCRIPTION 1100 MW combined cycle power plant consisting of three 180 MW Westinghouse 501F natural gas fired combustion turbines, three heat recovery steam generators (HRSGs) with duct burners. CITY/TWP Hanging Rock

SIC CODE 4911 SCC CODE 10200602 EMISSIONS UNIT ID B001

EMISSIONS UNIT DESCRIPTION 99 MMBtu/hr natural gas fired auxiliary boiler

DATE INSTALLED

EMISSIONS: (Click on bubble help for Air Quality Descriptions)

Pollutants	Air Quality Description	Actual Emissions Rate		PTI Allowable	
		Short Term Rate	Tons Per Year	Short Term Rate	Tons Per Year
Particulate Matter	attainment	0.0076 lb/MMBtu, 0.76 lb/hr	1.3 tpy	0.0076 lb/MMBtu 0.76 lb/hr	1.3 tpy
PM_{10}	attainment	0.0076 lb/MMBtu, 0.76 lb/hr	1.3 tpy	0.0076 lb/MMBtu 0.76 lb/hr	1.3 tpy
Sulfur Dioxide	attainment	0.0057 lb/MMBtu, 0.56 lb/hr	1.0 tpy	0.0057 lb/MMBtu 0.56 lb/hr	1.0 tpy
Organic Compounds	attainment	0.0055 lb/MMBtu, 0.545 lb/hr	1.0 tpy	0.0055 lb/MMBtu 0.545 lb/hr	1.0 tpy
Nitrogen Oxides	attainment	0.05 lb/MMBtu, 4.95 lbs/;hr	8.7 tpy	0.05 lb/MMBtu, 4.95 lbs/;	8.7 tpy
Carbon Monoxide	attainment	0.084 lb/MMBtu, 8.32 lbs/hr	14.6 tpy	0.084 lb/MMBtu, 8.32 lbs/hr	14.6 tpy
Lead	attainment				
Other: Air Toxics					

APPLICABLE FEDERAL RULES:

NSPS? 40 CFR, Part 60, Subpart Dc NESHAP? PSD? Y OFFSET POLICY?

WHAT IS THE BAT DETERMINATION, AND WHAT IS THE BASIS FOR THE DETERMINATION?
Use of natural gas as fuel, low sulfur fuel and low NOx burners.

IS THIS SOURCE SUBJECT TO THE AIR TOXICS POLICY? yes

OPTIONAL: WHAT IS THE CAPITAL COST OF CONTROL EQUIPMENT? $

TOXIC AIR CONTAMINANTS

Ohio EPA's air toxics policy applies to contaminants for which the American Conference of Governmental Industrial Hygienists (ACGIH) has a listed threshold limit value.

AIR TOXICS MODELING PERFORMED*? X YES NO

NEW SOURCE REVIEW FORM B

PTI Number: 07-00505 Facility ID: 0744000151

FACILITY NAME Lawrence Energy Center

FACILITY DESCRIPTION	1100 MW combined cycle power plant consisting of three 180 MW Westinghouse 501F natural gas fired combustion turbines, three heat recovery steam generators (HRSGs) with duct burners.	CITY/TWP	Hanging Rock

IDENTIFY THE AIR CONTAMINANTS: formaldehyde, sulfuric acid, ammonia, toluene, xylene, acetaldehyde, ethyl benzene, propylene oxide

NEW SOURCE REVIEW FORM B

PTI Number: 07-00505 Facility ID: 0744000151

FACILITY NAME Lawrence Energy Center

FACILITY DESCRIPTION 1100 MW combined cycle power plant consisting of three 180 MW Westinghouse 501F natural gas fired combustion turbines, three heat recovery steam generators (HRSGs) with duct burners. CITY/TWP Hanging Rock

SIC CODE 4911 SCC CODE 20100109 EMISSIONS UNIT ID P001

EMISSIONS UNIT DESCRIPTION 180 MW Westinghouse 501F natural gas fired combustion turbine No 1 with duct firing operating in combined cycle mode with selective catalytic reduction (SCR) and oxidation catalyst

DATE INSTALLED

EMISSIONS: (Click on bubble help for Air Quality Descriptions)

Pollutants	Air Quality Description	Actual Emissions Rate		PTI Allowable	
		Short Term Rate	Tons Per Year	Short Term Rate	Tons Per Year
Particulate Matter	attainment				
PM_{10}	attainment	12.7 lbs/hr w/o duct firing, 25.3 lbs/hr w/ duct firing	110.8 tpy	12.7 lbs/hr w/o duct firing, 25.3 lbs/hr w/ duct firing	110.8 tpy
Sulfur Dioxide	attainment	11.9 lbs/hr w/o duct firing, 16.1 lbs/hr w/ duct firing	70.5 tpy	11.9 lbs/hr w/o duct firing, 16.1 lbs/hr w/ duct firing	70.5 tpy
Organic Compounds	attainment	4.2 lbs/hr w/o duct firing, 30.7 lbs/hr w/ duct firing	148.5 tpy	4.2 lbs/hr w/o duct firing, 30.7 lbs/hr w/ duct firing	148.5 tpy
Nitrogen Oxides	attainment	24.1 lbs/hr w/o duct firing, 30.5 lbs/hr w/ duct firing	182.8 tpy	24.1 lbs/hr w/o duct firing, 30.5 lbs/hr w/ duct firing	182.8 tpy
Carbon Monoxide	attainment	32.4 lbs/hr w/o duct firing, 61.9 lbs/hr w/ duct firing	529.8 tpy	32.4 lbs/hr w/o duct firing, 61.9 lbs/hr w/ duct firing	529.8 tpy
Lead	attainment				
Other: Air Toxics					
sulfuric acid		2.72 lbs/hr w/o duct firing, 3.71 lbs/hr w/ duct firing	16.2 tpy	2.72 lbs/hr w/o duct firing, 3.71 lbs/hr w/ duct firing	16.2 tpy
ammonia		27.3 lbs/hr w/o duct firing, 37.7 lbs/hr w/ duct firing	165.1 tpy	27.3 lbs/hr w/o duct firing, 37.7 lbs/hr w/ duct firing	165.1 tpy

NEW SOURCE REVIEW FORM B

PTI Number: 07-00505 Facility ID: 0744000151

FACILITY NAME Lawrence Energy Center

FACILITY DESCRIPTION 1100 MW combined cycle power plant consisting of three 180 MW Westinghouse 501F natural gas fired combustion turbines, three heat recovery steam generators (HRSGs) with duct burners. CITY/TWP Hanging Rock

formaldehyde		0.75 lb/hr w/o duct firing, 1.02 lbs/hr w/ duct firing	4.47 tpy	0.75 lb/hr w/o duct firing, 1.02 lbs/hr w/ duct firing	4.47 tpy

APPLICABLE FEDERAL RULES:

NSPS? 40 CFR Part 60, Subparts GG & Da NESHAP? PSD? Y OFFSET POLICY?

WHAT IS THE BAT DETERMINATION, AND WHAT IS THE BASIS FOR THE DETERMINATION?

PM- Burning natural gas in an efficient combustion turbine. For this permit, it is assumed that all PM emissions are PM_{10}.

NOx- Use of DLN burners and employment of SCR with a controlled rate of 3.0 ppmvd at 15% oxygen (based on a 24 hour block averaging period).

CO- Use of oxidation catalyst and good combustion practices with a rate of 2.0 ppmvd at 15 % oxygen (based on a 24 hour block averaging period) without duct firing and 10.0 ppmvd at 15 % oxygen (based on a 24 hour block averaging period) with duct firing.

VOC- Use of efficient combustion technology in the operation of the turbine.

SO_2- Burning natural gas in an efficient combustion turbine and burning low sulfur fuel.

H_2SO_4-Burning natural gas in an efficient combustion turbine.

IS THIS SOURCE SUBJECT TO THE AIR TOXICS POLICY? yes

OPTIONAL: WHAT IS THE CAPITAL COST OF CONTROL EQUIPMENT? $

TOXIC AIR CONTAMINANTS

Ohio EPA's air toxics policy applies to contaminants for which the American Conference of Governmental Industrial Hygienists (ACGIH) has a listed threshold limit value.

AIR TOXICS MODELING PERFORMED*? X YES NO

IDENTIFY THE AIR CONTAMINANTS: formaldehyde, sulfuric acid, ammonia, toluene, xylene, acetaldehyde, ethyl benzene, propylene oxide

NEW SOURCE REVIEW FORM B

PTI Number: 07-00505 Facility ID: 0744000151

FACILITY NAME Lawrence Energy Center

FACILITY DESCRIPTION 1100 MW combined cycle power plant consisting of three 180 MW Westinghouse 501F natural gas fired combustion turbines, three heat recovery steam generators (HRSGs) with duct burners. CITY/TWP Hanging Rock

SIC CODE 4911 SCC CODE 20100109 EMISSIONS UNIT ID P002

EMISSIONS UNIT DESCRIPTION 180 MW Westinghouse 501F natural gas fired combustion turbine No 2 with duct firing operating in combined cycle mode controlled by selective catalytic reduction (SCR) and oxidation catalyst

DATE INSTALLED

EMISSIONS: (Click on bubble help for Air Quality Descriptions)

Pollutants	Air Quality Description	Actual Emissions Rate		PTI Allowable	
		Short Term Rate	Tons Per Year	Short Term Rate	Tons Per Year
Particulate Matter	attainment				
PM_{10}	attainment	12.7 lbs/hr w/o duct firing, 25.3 lbs/hr w/ duct firing	110.8 tpy	12.7 lbs/hr w/o duct firing, 25.3 lbs/hr w/ duct firing	110.8 tpy
Sulfur Dioxide	attainment	11.9 lbs/hr w/o duct firing, 16.1 lbs/hr w/ duct firing	70.5 tpy	11.9 lbs/hr w/o duct firing, 16.1 lbs/hr w/ duct firing	70.5 tpy
Organic Compounds	attainment	4.2 lbs/hr w/o duct firing, 30.7 lbs/hr w/ duct firing	148.5 tpy	4.2 lbs/hr w/o duct firing, 30.7 lbs/hr w/ duct firing	148.5 tpy
Nitrogen Oxides	attainment	24.1 lbs/hr w/o duct firing, 30.5 lbs/hr w/ duct firing	182.8 tpy	24.1 lbs/hr w/o duct firing, 30.5 lbs/hr w/ duct firing	182.8 tpy
Carbon Monoxide	attainment	32.4 lbs/hr w/o duct firing, 61.9 lbs/hr w/ duct firing	529.8 tpy	32.4 lbs/hr w/o duct firing, 61.9 lbs/hr w/ duct firing	529.8 tpy
Lead	attainment				
Other: Air Toxics					
sulfuric acid		2.72 lbs/hr w/o duct firing, 3.71 lbs/hr w/ duct firing	16.2tpy	2.72 lbs/hr w/o duct firing, 3.71 lbs/hr w/ duct firing	16.2 tpy
ammonia		27.3 lbs/hr w/o duct firing, 37.7 lbs/hr w/ duct firing	165.1 tpy	27.3 lbs/hr w/o duct firing, 37.7 lbs/hr w/ duct firing	165.1 tpy

NEW SOURCE REVIEW FORM B

PTI Number: 07-00505 Facility ID: 0744000151

FACILITY NAME Lawrence Energy Center

FACILITY DESCRIPTION 1100 MW combined cycle power plant consisting of three 180 MW Westinghouse 501F natural gas fired combustion turbines, three heat recovery steam generators (HRSGs) with duct burners. CITY/TWP Hanging Rock

formaldehyde		0.75 lb/hr w/o duct firing, 1.02 lbs/hr w/ duct firing	4.47 tpy	0.75 lb/hr w/o duct firing, 1.02 lbs/hr w/ duct firing	4.47 tpy

APPLICABLE FEDERAL RULES:

NSPS? 40 CFR Part 60, Subparts GG & Da NESHAP? PSD? Y OFFSET POLICY?

WHAT IS THE BAT DETERMINATION, AND WHAT IS THE BASIS FOR THE DETERMINATION?

PM- Burning natural gas in an efficient combustion turbine. For this permit, it is assumed that all PM emissions are PM_{10}.

NOx- Use of DLN burners and employment of SCR with a controlled rate of 3.0 ppmvd at 15% oxygen (based on a 24 hour block averaging period).

CO- Use of oxidation catalyst and good combustion practices with a rate of 2.0 ppmvd at 15 % oxygen (based on a 24 hour block averaging period) without duct firing and 10.0 ppmvd at 15 % oxygen (based on a 24 hour block averaging period) with duct firing.

VOC- Use of efficient combustion technology in the operation of the turbine.

SO_2- Burning natural gas in an efficient combustion turbine and burning low sulfur fuel.

H_2SO_4-Burning natural gas in an efficient combustion turbine.

IS THIS SOURCE SUBJECT TO THE AIR TOXICS POLICY? yes

OPTIONAL: WHAT IS THE CAPITAL COST OF CONTROL EQUIPMENT? $

TOXIC AIR CONTAMINANTS

Ohio EPA's air toxics policy applies to contaminants for which the American Conference of Governmental Industrial Hygienists (ACGIH) has a listed threshold limit value.

AIR TOXICS MODELING PERFORMED*? X YES NO

IDENTIFY THE AIR CONTAMINANTS: formaldehyde, sulfuric acid, ammonia, toluene, xylene, acetaldehyde, ethyl benzene, propylene oxide

NEW SOURCE REVIEW FORM B

PTI Number: 07-00505 Facility ID: 0744000151

FACILITY NAME Lawrence Energy Center

FACILITY DESCRIPTION 1100 MW combined cycle power plant consisting of three 180 MW Westinghouse 501F natural gas fired combustion turbines, three heat recovery steam generators (HRSGs) with duct burners. CITY/TWP Hanging Rock

SIC CODE 4911 SCC CODE 20100109 EMISSIONS UNIT ID P003

EMISSIONS UNIT DESCRIPTION 180 MW Westinghouse 501F natural gas fired combustion turbine No 3 with duct firing during combined cycle mode controlled by selective catalytic reduction (SCR) and oxidation catalyst

DATE INSTALLED

EMISSIONS: (Click on bubble help for Air Quality Descriptions)

Pollutants	Air Quality Description	Actual Emissions Rate		PTI Allowable	
		Short Term Rate	Tons Per Year	Short Term Rate	Tons Per Year
Particulate Matter	attainment				
PM_{10}	attainment	12.7 lbs/hr w/o duct firing, 25.3 lbs/hr w/ duct firing	110.8 tpy	12.7 lbs/hr w/o duct firing, 25.3 lbs/hr w/ duct firing	110.8 tpy
Sulfur Dioxide	attainment	11.9 lbs/hr w/o duct firing, 16.1 lbs/hr w/ duct firing	70.5 tpy	11.9 lbs/hr w/o duct firing, 16.1 lbs/hr w/ duct firing	70.5 tpy
Organic Compounds	attainment	4.2 lbs/hr w/o duct firing, 30.7 lbs/hr w/ duct firing	148.5 tpy	4.2 lbs/hr w/o duct firing, 30.7 lbs/hr w/ duct firing	148.5 tpy
Nitrogen Oxides	attainment	24.1 lbs/hr w/o duct firing, 30.5 lbs/hr w/ duct firing	182.8 tpy	24.1 lbs/hr w/o duct firing, 30.5 lbs/hr w/ duct firing	182.8 tpy
Carbon Monoxide	attainment	32.4 lbs/hr w/o duct firing, 61.9 lbs/hr w/ duct firing	529.8 tpy	32.4 lbs/hr w/o duct firing, 61.9 lbs/hr w/ duct firing	529.8 tpy
Lead	attainment				
Other: Air Toxics					
sulfuric acid		2.72 lbs/hr w/o duct firing, 3.71 lbs/hr w/ duct firing	16.2 tpy	2.72 lbs/hr w/o duct firing, 3.71 lbs/hr w/ duct firing	16.2 tpy
ammonia		27.3 lbs/hr w/o duct firing, 37.7 lbs/hr w/ duct firing	165.1 tpy	27.3 lbs/hr w/o duct firing, 37.7 lbs/hr w/ duct firing	165.1 tpy

NEW SOURCE REVIEW FORM B

PTI Number: 07-00505 Facility ID: 0744000151

FACILITY NAME Lawrence Energy Center

FACILITY DESCRIPTION 1100 MW combined cycle power plant consisting of three 180 MW Westinghouse 501F natural gas fired combustion turbines, three heat recovery steam generators (HRSGs) with duct burners. CITY/TWP Hanging Rock

formaldehyde		0.75 lb/hr w/o duct firing, 1.02 lbs/hr w/ duct firing	4.15 tpy	0.75 lb/hr w/o duct firing, 1.02 lbs/hr w/ duct firing	4.15 tpy

APPLICABLE FEDERAL RULES:

NSPS? 40 CFR Part 60, Subparts GG & Da NESHAP? PSD? Y OFFSET POLICY?

WHAT IS THE BAT DETERMINATION, AND WHAT IS THE BASIS FOR THE DETERMINATION?

PM- Burning natural gas in an efficient combustion turbine. For this permit, it is assumed that all PM emissions are PM_{10}.

NOx- Use of DLN burners and employment of SCR with a controlled rate of 3.0 ppmvd at 15% oxygen (based on a 24 hour block averaging period).

CO- Use of oxidation catalyst and good combustion practices with a rate of 2.0 ppmvd at 15 % oxygen (based on a 24 hour block averaging period) without duct firing and 10.0 ppmvd at 15 % oxygen (based on a 24 hour block averaging period) with duct firing.

VOC- Use of efficient combustion technology in the operation of the turbine.

SO_2- Burning natural gas in an efficient combustion turbine and burning low sulfur fuel.

H_2SO_4-Burning natural gas in an efficient combustion turbine.

IS THIS SOURCE SUBJECT TO THE AIR TOXICS POLICY? yes

OPTIONAL: WHAT IS THE CAPITAL COST OF CONTROL EQUIPMENT? $

TOXIC AIR CONTAMINANTS

Ohio EPA's air toxics policy applies to contaminants for which the American Conference of Governmental Industrial Hygienists (ACGIH) has a listed threshold limit value.

AIR TOXICS MODELING PERFORMED*? X YES NO

IDENTIFY THE AIR CONTAMINANTS: formaldehyde, sulfuric acid, ammonia, toluene, xylene, acetaldehyde, ethyl benzene, propylene oxide

NEW SOURCE REVIEW FORM B

PTI Number: 07-00505 Facility ID: 0744000151

FACILITY NAME Lawrence Energy Center

FACILITY DESCRIPTION 1100 MW combined cycle power plant consisting of three 180 MW Westinghouse 501F natural gas fired combustion turbines, three heat recovery steam generators (HRSGs) with duct burners. CITY/TWP Hanging Rock

SIC CODE 4911 SCC CODE 38500101 EMISSIONS UNIT ID P004

EMISSIONS UNIT DESCRIPTION 22 cell mechanical draft cooling tower

DATE INSTALLED

EMISSIONS: (Click on bubble help for Air Quality Descriptions)

Pollutants	Air Quality Description	Actual Emissions Rate		PTI Allowable	
		Short Term Rate	Tons Per Year	Short Term Rate	Tons Per Year
Particulate Matter	attainment	1.69	7.40	1.69	7.40
PM_{10}	attainment	1.69	7.40	1.69	7.40
Sulfur Dioxide					
Organic Compounds					
Nitrogen Oxides					
Carbon Monoxide					
Lead					
Other: Air Toxics					

APPLICABLE FEDERAL RULES:

NSPS? NESHAP? PSD? Y OFFSET POLICY?

WHAT IS THE BAT DETERMINATION, AND WHAT IS THE BASIS FOR THE DETERMINATION?
Enter Determination

IS THIS SOURCE SUBJECT TO THE AIR TOXICS POLICY? no

OPTIONAL: WHAT IS THE CAPITAL COST OF CONTROL EQUIPMENT? $

TOXIC AIR CONTAMINANTS

Ohio EPA's air toxics policy applies to contaiminants for which the American Conference of Governmental Industrial Hygienists (ACGIH) has a listed threshold limit value.

AIR TOXICS MODELING PERFORMED*? YES NO

IDENTIFY THE AIR CONTAMINANTS: