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 Miami - Rade Water # 50  
 4700 Salzedo St.  
 Coral Gables, FL 33146-0316

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	0350476-002-AC
	PSD-FI-340

PS Form 3800 April 1995

STATE OF FLORIDA  
DEPARTMENT OF ENVIRONMENTAL PROTECTION  
NOTICE OF FINAL PERMIT

In the Matter of an  
Application for Permit

Mr. Robert C. Ready, P.E.  
Miami-Dade Water & Sewer Department  
4200 Salzedo Street  
Coral Gables, Florida 33146-0316

DEP File No. 0250476-002-AC  
PSD-FL-240

Enclosed is the FINAL Permit Number PSD-FL-240 for increasing the hours of operation for the three 2.5 megawatt diesel electric generators and four 1.2 megawatt digester gas electric generators at the Central District Wastewater Treatment Plant, Dade County. This permit is issued pursuant to Chapter 403, Florida Statutes and in accordance with Rule 62-212.400., F.A.C. - Prevention of Significant Deterioration(PSD).

Any party to this order (permit) has the right to seek judicial review of the permit pursuant to Section 120.68, F.S., by the filing of a Notice of Appeal pursuant to Rule 9.110, Florida Rules of Appellate Procedure, with the Clerk of the Department in the Legal Office; and by filing a copy of the Notice of Appeal accompanied by the applicable filing fees with the appropriate District Court of Appeal. The Notice of Appeal must be filed within 30 (thirty) days from the date this Notice is filed with the Clerk of the Department.

Executed in Tallahassee, Florida.

  
C.H. Fancy, P.E., Chief  
Bureau of Air Regulation

CERTIFICATE OF SERVICE

The undersigned duly designated deputy agency clerk hereby certifies that this NOTICE OF FINAL PERMIT (including the FINAL permit) was sent by certified mail (\*) and copies were mailed by U.S. Mail before the close of business on 3-17-99 to the person(s) listed:

Mr. Robert C. Ready, Miami-Dade Water & Sewer Department \*  
Mr. Gregg Worley, EPA  
Mr. John Bunyak, NPS  
Mr. Isidore Goldman, SED  
Mr. Patrick Wong, DERM

Clerk Stamp

FILING AND ACKNOWLEDGMENT FILED, on this date, pursuant to §120.52, Florida Statutes, with the designated Department Clerk, receipt of which is hereby acknowledged.

Kuni Joben 3-17-99  
(Clerk) (Date)

## **FINAL DETERMINATION**

### **Miami-Dade Water and Sewer Department**

**Permit No. 0250476-002-AC, PSD-FL-240**

### **Central District Wastewater Treatment Plant**

An Intent to Issue an air construction permit to Miami-Dade Water and Sewer Department to increase the hours of operation of its three existing diesel generators and four existing digester gas generators at Central District Wastewater Treatment Plant in Dade County, was distributed on January 28, 1999. The Notice of Intent was published in the Miami Daily Business Review on February 8, 1999. Copies of the draft construction permit were available for public inspection at the Department's offices in West Palm Beach and Tallahassee and the Air Program Office of the Miami-Dade Department of Environmental Resources Management.

No comments were submitted by the National Park Service, the U.S. Environmental Protection Agency or the public.

The final action of the Department is to issue the permit as proposed.



# Department of Environmental Protection

Jeb Bush  
Governor

Twin Towers Office Building  
2600 Blair Stone Road  
Tallahassee, Florida 32399-2400

David B. Struhs  
Secretary

## PERMITTEE:

**Miami-Dade Water and Sewer Department**  
4200 Salzedo Street  
Coral Gables, Florida 33146-0316

### *Authorized Representative:*

Robert C. Ready, P.E.  
Assistant Director of Treatment Facility

<b>FID No.</b>	0250476
<b>PSD No.</b>	PSD-FL-240
<b>SIC No.</b>	4952
<b>Project:</b>	Diesel Generators
<b>Permit No.</b>	0250476-002-AC
<b>Expires:</b>	December 31, 1999

## PROJECT AND LOCATION:

Permit for increasing the hours of operation for the three 2.5 megawatt diesel electric generators and four 1.2 megawatt digester gas electric generators at the Central District Wastewater Treatment Plant, Virginia Key, Miami, Dade County. UTM coordinates are Zone 17; 585.2 km E; 2848.1 km N.

## STATEMENT OF BASIS:

This construction permit is issued under the provisions of Chapter 403 of the Florida Statutes (F.S.), and the Florida Administrative Code (F.A.C.) Chapters 62-4, 62-204, 62-210, 62-212, 62-296, and 62-297. The above named permittee is authorized to modify the facility in accordance with the conditions of this permit and as described in the application, approved drawings, plans, and other documents on-file with the Department of Environmental Protection (Department).

## Attached appendices are made a part of this permit:

Appendix BD	BACT Determination
Appendix GC	Construction Permit General Conditions
Appendix CSC	Emission Unit(s) Common Specific Conditions

Howard L. Rhodes, Director  
Division of Air Resources  
Management

"Protect, Conserve and Manage Florida's Environment and Natural Resources"

# AIR CONSTRUCTION PERMIT 0250476-002-AC AND PSD-FL-240

## SECTION I. FACILITY INFORMATION

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### SUBSECTION A. FACILITY DESCRIPTION

The Miami-Dade Water and Sewer Department (WASD) Central District Wastewater Treatment Plant presently consists of three nominal 2.5 Megawatt (MW) diesel engine-driven generators, designated as Units 13 and 14 and 15; four nominal 1.2 MW digester gas engine-driven generators, designated as Units 7, 9, 10 and 11; and one wastewater treatment plant, designated as Unit 8. This permit is to increase the hours of operation for the seven generators (Units 7, 9, 10, 11, 13, 14 and 15) and to limit the potential-to-emit of units 7, 9, 10 and 11.

### SUBSECTION B. REGULATORY CLASSIFICATION

The Central District Wastewater Treatment is classified as a Major Source of Air Pollution or Title V Source because it emits or has the potential to emit at least 100 tons per year of nitrogen oxides (NO<sub>x</sub>) and carbon monoxide (CO). It is also a Major Facility with respect to preconstruction review because it emits or has the potential to emit at least 250 tons per year of NO<sub>x</sub>.

### SUBSECTION C. PERMIT SCHEDULE:

- 07-24-97: Date of Receipt of Application
- 10-21-98: Application deemed complete
- 12-31-98: Intent issued
- 01-28-99: Revised Intent issued
- 02-08-99: Notice of Intent published in Miami Daily Business Review

### SUBSECTION D. RELEVANT DOCUMENTS:

The documents listed form the basis of the permit. They are specifically related to this permitting action. These documents are on file with the Department.

- Application received 7-24-97
- Department's letters dated 8-21-97, 3-9-98, and 4-15-98
- Company letters dated 3-16-98, and 10-21-98
- Technical Evaluation and Preliminary Determination dated 12-31-98
- Revised Technical Evaluation and Preliminary Determination dated 01-28-99
- Best Available Control Technology determination (issued concurrently with permit)

# AIR CONSTRUCTION PERMIT 0250476-002-AC AND PSD-FL-240

## SECTION II. EMISSION UNIT(S) GENERAL REQUIREMENTS

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### SUBSECTION A. ADMINISTRATIVE

- A.1 Regulating Agencies: All documents related to applications for permits to operate, reports, tests, minor modifications and notifications shall be submitted to the Department of Environmental Protection, Southeast District Office located at 400 North Congress Avenue, West Palm Beach, Florida 33401, and phone number (561) 681-6600. All applications for permits to construct or modify an emission unit(s) *subject to the Prevention of Significant Deterioration (PSD)* should be submitted to the Bureau of Air Regulation (BAR), Florida Department of Environmental Protection (FDEP) located at 2600 Blairstone Road, Tallahassee, Florida 32399-2400 and phone number (850)488-0114.
- A.2 General Conditions: The owner and operator is subject to and shall operate under the attached General Permit Conditions G.1 through G.15 listed in *Appendix GC* of this permit. General Permit Conditions are binding and enforceable pursuant to Chapter 403 of the Florida Statutes. [Rule 62-4.160, F.A.C.]
- A.3 Emission Unit(s) Common Specific Conditions: The owner and operator is subject to and shall operate under the attached Emission Unit(s) Common Specific Conditions listed in *Appendix CSC* of this permit. The Emission Unit(s) Common Specific Conditions are binding and enforceable pursuant to Chapters 62-204 through 62-297 of the Florida Administrative Code.
- A.4 Terminology: The terms used in this permit have specific meanings as defined in the corresponding chapters of the Florida Administrative Code.
- A.5 Forms and Application Procedures: The permittee shall use the applicable forms listed in Rule 62-210.900, F.A.C. and follow the application procedures in Chapter 62-4, F.A.C. [Rule 62-210.900, F.A.C.]
- A.6 Expiration: This air construction permit shall expire on **December 31, 1999**. [Rule 62-210.300(1), F.A.C.]. The permittee may, for good cause, request that this construction permit be extended. Such a request shall be submitted to the Bureau of Air Regulation prior to 60 days before the expiration of the permit. However, the permittee shall promptly notify the permitting authority office of any delays in completion of the project which would affect the startup day by more than 90 days. [Rule 62-4.090, F.A.C.]
- A.7 Applicable Regulations: The facility is subject to the following regulations: Florida Administrative Code Chapters 62-4; 62-103; 62-204; 62-210; 62-212, 62-296, and 62-297. Issuance of this permit does not relieve the facility owner or operator from compliance with any applicable federal, state, or local permitting requirements or regulations. [Rule 62-210.300, F.A.C.]

# AIR CONSTRUCTION PERMIT 0250476-002-AC AND PSD-FL-240

## SECTION III. EMISSION UNIT(S) SPECIFIC CONDITIONS

### SUBSECTION A. LISTING OF EMISSIONS UNITS

This permit addresses the following emission units.

EMISSIONS UNIT NO.	SYSTEM	EMISSIONS UNITS DESCRIPTION
007	Power	1.2 MW Digester Gas Electric Generator
009	Power	1.2 MW Digester Gas Electric Generator
010	Power	1.2 MW Digester Gas Electric Generator
011	Power	1.2 MW Digester Gas Electric Generator
013	Power	2.5 MW Diesel Electric Generator
014	Power	2.5 MW Diesel Electric Generator
015	Power	2.5 MW Diesel Electric Generator

### SUBSECTION B. SPECIFIC CONDITIONS (UNITS 013, 014 AND 015):

The following Specific Conditions apply to the following emission unit:

EMISSION UNIT NO.	SYSTEM	EMISSION UNIT DESCRIPTION
013	Power	2.5 MW Diesel Electric Generator
014	Power	2.5 MW Diesel Electric Generator
015	Power	2.5 MW Diesel Electric Generator

### EMISSION LIMITATIONS

- B.1 The maximum allowable emission rates for NO<sub>x</sub> for Units No. 013, 014 and 015 shall not exceed 58 pounds per hour (lb/hr) each and 267 tons per year (TPY) combined pursuant to the Best Available Control Technology (BACT) Determination. [Rule 62-212.400(6), F.A.C.]
- B.2 Visible emissions shall be less than 20% opacity. [Rule 62-296.320, F.A.C.]
- B.3 In order to minimize excess emissions during startup/shutdown/malfunction this emission unit shall adhere to best operational practices. [Rule 62-210.700, F.A.C.]

### OPERATIONAL LIMITATIONS

- B.4 The emission unit is allowed to operate continuously (8760 hours/year) at reduced load. [Rule 62-210.200, F.A.C., Definitions: Potential-to-Emit].
- B.5 Only No. 2 fuel oil can be fired in the diesel generator. The maximum sulfur content of the No. 2 fuel oil shall not exceed 0.05 percent, by weight. [Rule 62-210.200, F.A.C., Definitions: Potential-to-Emit].
- B.6 The combined maximum heat input rate to Units No. 013, 014 and 015 shall not exceed 81 million Btu per hour (MMBtu/hr) at 100 percent load. [Rule 62-210.200, F.A.C., Definitions: Potential-to-Emit].

# AIR CONSTRUCTION PERMIT 0250476-002-AC AND PSD-FL-240

## SECTION III. EMISSION UNIT(S) SPECIFIC CONDITIONS

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- B.7 The maximum No. 2 fuel oil consumption allowed to be burned in Units No. 013, 014 and 015 is 1,800,000 gallons per year, which is equivalent to 3056 hours per year of operation at full load for each unit. [Rule 62-210.200, F.A.C., Definitions: Potential-to-Emit]

### TEST METHODS AND PROCEDURES

- B.8 Compliance with the allowable emission limiting standards for NO<sub>x</sub> in B.1 shall be determined by using EPA Reference Method 7 (or equivalent) as described in 40 CFR 60, Appendix A (1996, version) adopted by reference in Rule 62-204.800, F.A.C. [Rule 62-297.401, F.A.C.]
- B.9 The fuel shall be monitored for the sulfur content using ASTM D4294 Method (or equivalent), or by maintaining records of fuel sulfur content certifications, as provided by the fuel supplier. [Rule 62-297.440, F.A.C.]
- B.10 The permittee shall maintain daily records of fuel oil consumption for the emission unit. [Rule 62-210.200, F.A.C.]
- B.11 Compliance with the visible emission standard shall be demonstrated with EPA Reference Method 9 as described in 40 CFR 60, Appendix A (1996, version) adopted by reference in Rule 62-204.800, F.A.C. [Rule 62-297.401, F.A.C.]

### RECORDKEEPING AND REPORTING REQUIREMENTS

- B.12 All measurements, records, and other data required to be maintained by this facility shall be retained for at least five (5) years following the data on which such measurements, records, or data are recorded. These data shall be made available to the Department upon request. [Rule 62-4.070(3), F.A.C.]
- B.13 Two copies of the results of the emission tests for the pollutant listed in Condition B.1 for Units No. 13, 14 and 15 shall be submitted within forty-five days of the last sampling run to the Southeast District office in West Palm Beach. All reports shall be in a format consistent with and shall include the information in accordance with Rule 62-297.310 (8), F.A.C. [Rule 62-297.310(8), F.A.C.]



AIR CONSTRUCTION PERMIT 0250476-002-AC AND PSD-FL-240

**SECTION III. EMISSION UNIT(S) SPECIFIC CONDITIONS**

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**SUBSECTION C. SPECIFIC CONDITIONS (UNITS 007, 009, 010 AND 011)**

The following Specific Conditions apply to the following emission units:

EMISSIONS UNIT NO.	SYSTEM	EMISSIONS UNITS DESCRIPTION
007	Power	1.2 MW Digester Gas Electric Generator
009	Power	1.2 MW Digester Gas Electric Generator
010	Power	1.2 MW Digester Gas Electric Generator
011	Power	1.2 MW Digester Gas Electric Generator

**EMISSION LIMITATIONS**

- C.1 The maximum allowable emission rates for NO<sub>x</sub> for Units No. 007, 009, 010 and 011 shall not exceed 7.6 pounds per hour (lb/hr) each and 133 tons per year (TPY) combined. [Rule 62-210.200, F.A.C., Definitions: Potential-to-Emit.]
- C.2 Visible emissions shall be less than 20% opacity. [Rule 62-296.320, F.A.C.]
- C.3 In order to minimize excess emissions during startup/shutdown/malfunction this emission unit shall adhere to best operational practices. [Rule 62-210.700, F.A.C.]

**OPERATIONAL LIMITATIONS**

- C.4 The existing Units No. 007, 009, 010 and 011 are allowed to operate continuously (8760 hours per year). [Rule 62-210.200, F.A.C., Definitions: Potential-to-Emit ]
- C.5 Only digester gas can be fired in the diesel generators 007, 009, 010 and 011. The maximum annual usage rate of the digester gas shall be 656,000,000 cubic feet. [Rule 62-210.200, F.A.C., Definitions: Potential-to-Emit]

**TEST METHODS AND COMPLIANCE PROCEDURES**

- C.6 Compliance with the allowable emission limiting standards for NO<sub>x</sub> in C.1 shall be determined by using EPA Reference Method 7 (or equivalent) as described in 40 CFR 60, Appendix A (1996, version) adopted by reference in Rule 62-204.800, F.A.C. [Rule 62-297.401, F.A.C.]
- C.7 Compliance with the visible emission standard shall be demonstrated with EPA Reference Method 9 as described in 40 CFR 60, Appendix A (1996, version) adopted by reference in 62-204.800, F.A.C. [Rule 62-297.310, F.A.C.]

**APPENDIX BD**  
**BEST AVAILABLE CONTROL TECHNOLOGY DETERMINATION (BACT)**

**Central District Wastewater Treatment Plant**  
**Miami-Dade Water and Sewer Department**  
**PSD-FL-240 and 0250476-002-AC**  
**Miami, Dade County**

The Miami-Dade Water and Sewer Department (WASD) plans to increase the hours of operation of its three existing standby Diesel Engine Generators at Central District Wastewater Treatment Plant (WWTP) in Miami, Dade County. The units are Electro-Motive Diesel generator model 20-645E4 with a nominal base load rating of 2.5 megawatts (MW) each. The units will be fired with No. 2 fuel oil with a sulfur content of 0.05 percent or less, by weight, and a fuel oil consumption limit of 1.800 million gallons per year. The facility additionally consists of four (4) digester gas engine generators used for peaking power. These units are each rated at 1.2 MW burning digester gas. The facility also has two parallel wastewater treatment trains.

WASD has indicated that the maximum annual air pollutant emission rates in tons per year for the three diesel generators, based on consumption of 1.800 million gallons of No. 2 fuel oil, with a maximum sulfur content of 0.05 percent, by weight, will be:

Pollutant	PSD Significance Levels <sup>1</sup>	Maximum Emissions	Subject to PSD Review?
NO <sub>x</sub>	40	267 <sup>2</sup>	Yes
CO	100	37.7 <sup>3</sup>	No
PM/PM <sub>10</sub>	25/15	9.8 <sup>4</sup>	No
SO <sub>2</sub>	40	9.6 <sup>5</sup>	No
VOC	40	14.7 <sup>6</sup>	No

<sup>1</sup> Florida Administrative Code 212.400-2

<sup>2</sup> Maximum emissions based on operation at 3,056 hours per year at full load while firing No. 2 fuel oil (0.05% sulfur by weight).

<sup>3</sup> Maximum emissions based on continuous operation at 25 percent load while firing No. 2 fuel oil (0.05% sulfur by weight).

<sup>4</sup> Maximum emissions based on operation at 8,590 hours per year at 50 percent load while firing No. 2 fuel oil (0.05% sulfur by weight).

<sup>5</sup> Maximum emissions based on operation at 8,590 hours per year at 50 percent load while firing No. 2 fuel oil (0.05% by weight).

<sup>6</sup> Maximum emissions based on operation at 8,590 hours per year at 50 percent load while firing No. 2 fuel oil (0.05% by weight).

Following is the BACT determination proposed by the applicant:

**BACT DETERMINATION REQUESTED BY THE APPLICANT:**

POLLUTANT	EMISSION LIMIT
Nitrogen Oxides	58 lbs/hr each by timing retardation and aftercoolers

The Central District Wastewater Treatment Plant is a major source of air pollution or Title V source. Because emissions of nitrogen oxides are greater than 250 tons per year, it is a major facility with respect to the Prevention of Significant Deterioration (Rule 62-212.400). Because the project will result in a significant increase in nitrogen

**APPENDIX BD**  
**BEST AVAILABLE CONTROL TECHNOLOGY DETERMINATION (BACT)**

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oxides emissions per Table 62-212.400-2, F.A.C., "Regulated Air Pollutants - Significant Emissions Rates," a BACT determination is required pursuant to Rule 62-212.410, F.A.C.

**DATE OF RECEIPT OF A BACT APPLICATION:**

July 24, 1997

**REVIEWER:**

Syed Arif, P.E., prepared BACT

**BACT DETERMINATION PROCEDURE:**

In accordance with Chapter 62-212, F.A.C., this BACT determination is based on the maximum degree of reduction of each pollutant emitted which the Department of Environmental Protection (Department), on a case by case basis, taking into account energy, environmental and economic impacts, and other costs, determines is achievable through application of production processes and available methods, systems, and techniques. In addition, the regulations state that, in making the BACT determination, the Department shall give consideration to:

- Any Environmental Protection Agency determination of BACT pursuant to Section 169, and any emission limitation contained in 40 CFR Part 60 - Standards of Performance for New Stationary Sources or 40 CFR Part 61 - National Emission Standards for Hazardous Air Pollutants.
- All scientific, engineering, and technical material and other information available to the Department.
- The emission limiting standards or BACT determination of any other state.
- The social and economic impact of the application of such technology.

The EPA currently stresses that BACT should be determined using the "top-down" approach. The first step in this approach is to determine, for the emission unit in question, the most stringent control available for a similar or identical emission unit or emission unit category. If it is shown that this level of control is technically or economically unfeasible for the emission unit in question, then the next most stringent level of control is determined and similarly evaluated. This process continues until the BACT level under consideration cannot be eliminated by any substantial or unique technical, environmental, or economic objections.

The air pollutant emissions from this facility can be grouped into categories based upon the control equipment and techniques that are available to control emissions from these emission units. Using this approach, the emissions can be classified as follows:

- **Combustion Products** (e.g., SO<sub>2</sub>, NO<sub>x</sub>, PM). Controlled generally by good combustion of clean fuels, removal in add-on control equipment.
- **Products of Incomplete Combustion** (e.g., CO, VOC). Control is largely achieved by proper combustion techniques.

Grouping the pollutants in this manner facilitates the BACT analysis because it enables the equipment available to control the type or group of pollutants emitted and the corresponding energy, economic, and environmental impacts to be examined on a common basis. Although all of the pollutants addressed in the BACT analysis may be subject to a specific emission limiting standard as a result of PSD review, the control of "non-regulated" air pollutants is

**APPENDIX BD**  
**BEST AVAILABLE CONTROL TECHNOLOGY DETERMINATION (BACT)**

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considered in imposing a more stringent BACT limit on a "regulated" pollutant (i.e., PM, SO<sub>2</sub>, H<sub>2</sub>SO<sub>4</sub>, fluorides, etc.), if a reduction in "non-regulated" air pollutants can be directly attributed to the control device selected as BACT for the abatement of the "regulated" pollutants.

**BACT POLLUTANT ANALYSIS**

**NITROGEN OXIDES (NO<sub>x</sub>)**

Oxides of nitrogen (NO<sub>x</sub>) are generated during fuel combustion by oxidation of chemically bound nitrogen in the fuel (fuel NO<sub>x</sub>) and by thermal fixation of nitrogen in the combustion air (thermal NO<sub>x</sub>). As flame temperature increases, the amount of thermally generated NO<sub>x</sub> increases. Fuel type affects the quantity and type of NO<sub>x</sub> generated. Generally, natural gas is low in nitrogen. However it causes higher flame temperatures and generates more thermal NO<sub>x</sub> than oil or coal, which have higher fuel nitrogen content, but exhibit lower flame temperatures.

NO<sub>x</sub> emissions represent a significant portion of the total emissions generated by this project, and must be minimized using BACT. A review of EPA BACT/LAER Clearinghouse (BACT Clearinghouse) information indicates that NO<sub>x</sub> emissions at most small facilities are minimized by process control and good combustion practices.

In a diesel engine, injection of fuel into the cylinder starts the combustion process. Retarding the timing of fuel injection until the piston is in its downward motion increases the volume of the combustion chamber, which reduces combustion temperature and pressure, subsequently reducing the formation of NO<sub>x</sub>. However, fuel injection timing retardation (IR) generally increases black smoke and cold smoke (white smoke during start up) emissions, as well as increasing exhaust temperatures. The increase in exhaust temperatures affect turbocharger performance and may be detrimental to exhaust valve life. A small increase in fuel consumption (2 percent) and a significant increase in particulate emissions (25 percent) usually result from the application of IR alone to diesel engines. To counteract this problem, it has been demonstrated that the installation of a device to cool the combustion air upstream of the cylinder alleviates most of the negative side effects of IR.

In large bore diesel engines equipped with a turbocharger, the combustion air pre-cooler consists of a heat exchanger, located downstream of the turbocharger, and is typically referred to as an after-cooler. Cooler air box temperatures reduce bulk combustion temperature, which reduces NO<sub>x</sub> formation. Because cooler air is denser, the cylinders are charged with a greater mass of air that generally helps reduce emissions of unburned hydrocarbons, carbon monoxide, and particulate matter. Manufacturer's test results have shown that installation of four-pass after-coolers piped to the engine's cooling system reduce uncontrolled emissions of NO<sub>x</sub> and PM<sub>10</sub> by up to 10 percent while slightly lowering fuel consumption (0.5 to 1 percent). Tests have also shown that combining a 4-degree IR with the installation of a four pass after-cooler will reduce NO<sub>x</sub> emissions by 28 percent and PM<sub>10</sub> emissions by 7 percent with a slight decrease in fuel consumption.

The applicant has proposed modification of the combustion process through a combination of fuel injection timing retardation and cooling of combustion air resulting in exhaust temperature reduction. The design specific to WASH's 20-645E4 includes a 4° injection timing retardation and a 4-pass after-cooler circuit. The combination of retarded injection timing and lowered combustion air temperature results in less NO<sub>x</sub> formation. **This combination of NO<sub>x</sub> controls, proper engine design, good combustion practices, and the use of low sulfur fuel should provide effective emissions control.**

**BACT DETERMINATION BY DEP:**

Based on the information provided by the applicant and the information searches conducted by the Department, lower emissions limits can be obtained employing the top-down BACT approach for NO<sub>x</sub>.

**APPENDIX BD**  
**BEST AVAILABLE CONTROL TECHNOLOGY DETERMINATION (BACT)**

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**NO<sub>x</sub> DETERMINATION**

The top-down BACT approach for diesel fired internal combustion engines listed in order from most stringent control to least:

1. Selective Catalytic Reduction (SCR)
2. Combined technologies of injection timing retardation, turbocharger with aftercoolers
3. Good combustion design/practices

The following table summarizes the feasibility of using these control technologies with the EMD 20-645E4 as designed for installation in WASD's Central District Wastewater Treatment Plant.

Control Technology	Emission Reduction (%)	Technically Feasible	Cost per ton (\$)	Adverse Environ. Impacts	Adverse Energy Impacts
SCR with ammonia	75-95	No	3,800	Yes	N/A
SCR with urea	80	No	N/A	N/A	N/A
Timing retard; turbo charger aftercoolers	28	Yes	31	No	0.3%
Dry/Low NO <sub>x</sub>	18	No	N/A	N/A	N/A

SCR is more widely used in Japan and Germany than it is in the United States and the technology is being improved such that the hazards and costs have been reduced. It remains, however, a costly technology for small applications and has potential hazards associated with the use and storage of ammonia. SCR is not generally used with diesel engines of this size. The BACT/LAER database lists only a single facility which uses SCR on diesel engines. SCR was selected in that instance because a local ordinance mandated strict limits on emissions without regards to cost. SCR is not technically feasible for this diesel engine because the exhaust temperatures will be below 550°F up to 50 percent of the time. In order for SCR technology to achieve effective reduction of NO<sub>x</sub>, the catalyst temperature must be at least 550°F.

For NO<sub>x</sub> emissions, the Department accepts the applicants proposed use of injection timing retardation and cooling of combustion air as BACT for this project.

The BACT emission levels established by the Department are as follows:

POLLUTANT	EMISSION LIMIT
Nitrogen Oxides (NO <sub>x</sub> )	58 lbs/hr each (267 TPY combined)

**COMPLIANCE**

Compliance with the NO<sub>x</sub> limitations shall be in accordance with the EPA Reference Method 7 or equivalent as contained in 40 C.F.R 60, Appendix A.

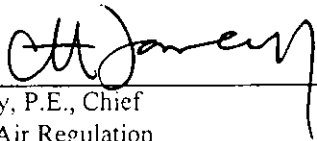
**APPENDIX BD**  
**BEST AVAILABLE CONTROL TECHNOLOGY DETERMINATION (BACT)**

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DETAILS OF THE ANALYSIS MAY BE OBTAINED BY CONTACTING:

Syed Arif, P.E.  
Department of Environmental Protection  
Bureau of Air Regulation  
2600 Blair Stone Road  
Tallahassee, Florida 32399-2400

Recommended By:

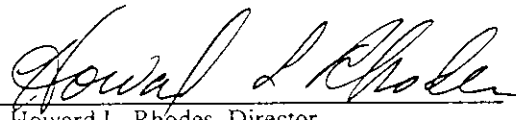


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C. H. Fancy, P.E., Chief  
Bureau of Air Regulation

3/16/99

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Date:

Approved By:



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Howard L. Rhodes, Director  
Division of Air Resources Management

3/17/99

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Date:

**APPENDIX GC**  
GENERAL PERMIT CONDITIONS [F.A.C. 62-4.160]

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- G.1 The terms, conditions, requirements, limitations, and restrictions set forth in this permit are "Permit Conditions" and are binding and enforceable pursuant to Sections 403.161, 403.727, or 403.859 through 403.861, Florida Statutes. The permittee is placed on notice that the Department will review this permit periodically and may initiate enforcement action for any violation of these conditions.
- G.2 This permit is valid only for the specific processes and operations applied for and indicated in the approved drawings or exhibits. Any unauthorized deviation from the approved drawings or exhibits, specifications, or conditions of this permit may constitute grounds for revocation and enforcement action by the Department.
- G.3 As provided in Subsections 403.087(6) and 403.722(5), Florida Statutes, the issuance of this permit does not convey and vested rights or any exclusive privileges. Neither does it authorize any injury to public or private property or any invasion of personal rights, nor any infringement of federal, state or local laws or regulations. This permit is not a waiver or approval of any other Department permit that may be required for other aspects of the total project which are not addressed in the permit.
- G.4 This permit conveys no title to land or water, does not constitute State recognition or acknowledgment of title, and does not constitute authority for the use of submerged lands unless herein provided and the necessary title or leasehold interests have been obtained from the State. Only the Trustees of the Internal Improvement Trust Fund may express State opinion as to title.
- G.5 This permit does not relieve the permittee from liability for harm or injury to human health or welfare, animal, or plant life, or property caused by the construction or operation of this permitted source, or from penalties therefore; nor does it allow the permittee to cause pollution in contravention of Florida Statutes and Department rules, unless specifically authorized by an order from the Department.
- G.6 The permittee shall properly operate and maintain the facility and systems of treatment and control (and related appurtenances) that are installed or used by the permittee to achieve compliance with the conditions of this permit, as required by Department rules. This provision includes the operation of backup or auxiliary facilities or similar systems when necessary to achieve compliance with the conditions of the permit and when required by Department rules.
- G.7 The permittee, by accepting this permit, specifically agrees to allow authorized Department personnel, upon presentation of credentials or other documents as may be required by law and at a reasonable time, access to the premises, where the permitted activity is located or conducted to:
- (a) Have access to and copy and records that must be kept under the conditions of the permit;
  - (b) Inspect the facility, equipment, practices, or operations regulated or required under this permit, and,
  - (c) Sample or monitor any substances or parameters at any location reasonably necessary to assure compliance with this permit or Department rules.
- Reasonable time may depend on the nature of the concern being investigated.
- G.8 If, for any reason, the permittee does not comply with or will be unable to comply with any condition or limitation specified in this permit, the permittee shall immediately provide the Department with the following information:
- (a) A description of and cause of non-compliance; and
  - (b) The period of noncompliance, including dates and times; or, if not corrected, the anticipated time the non-compliance is expected to continue, and steps being taken to reduce, eliminate, and prevent recurrence of the non-compliance.

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GENERAL PERMIT CONDITIONS [F.A.C. 62-4.160]

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The permittee shall be responsible for any and all damages which may result and may be subject to enforcement action by the Department for penalties or for revocation of this permit.

- G.9 In accepting this permit, the permittee understands and agrees that all records, notes, monitoring data and other information relating to the construction or operation of this permitted source which are submitted to the Department may be used by the Department as evidence in any enforcement case involving the permitted source arising under the Florida Statutes or Department rules, except where such use is prescribed by Sections 403.73 and 403.111, Florida Statutes. Such evidence shall only be used to the extent it is consistent with the Florida Rules of Civil Procedure and appropriate evidentiary rules.
- G.10 The permittee agrees to comply with changes in Department rules and Florida Statutes after a reasonable time for compliance, provided, however, the permittee does not waive any other rights granted by Florida Statutes or Department rules.
- G.11 This permit is transferable only upon Department approval in accordance with Florida Administrative Code Rules 62-4.120 and 62-730.300, F.A.C., as applicable. The permittee shall be liable for any non-compliance of the permitted activity until the transfer is approved by the Department.
- G.12 This permit or a copy thereof shall be kept at the work site of the permitted activity.
- G.13 This permit also constitutes:
- (a) Determination of Best Available Control Technology (X)
  - (b) Determination of Prevention of Significant Deterioration (X); and
  - (c) Compliance with New Source Performance Standards ( ).
- G.14 The permittee shall comply with the following:
- (a) Upon request, the permittee shall furnish all records and plans required under Department rules. During enforcement actions, the retention period for all records will be extended automatically unless otherwise stipulated by the Department.
  - (b) The permittee shall hold at the facility or other location designated by this permit records of all monitoring information (including all calibration and maintenance records and all original strip chart recordings for continuous monitoring instrumentation) required by the permit, copies of all reports required by this permit, and records of all data used to complete the application or this permit. These materials shall be retained at least three years from the date of the sample, measurement, report, or application unless otherwise specified by Department rule.
  - (c) Records of monitoring information shall include:
    - 1. The date, exact place, and time of sampling or measurements;
    - 2. The person responsible for performing the sampling or measurements;
    - 3. The dates analyses were performed;
    - 4. The person responsible for performing the analyses;
    - 5. The analytical techniques or methods used; and
    - 6. The results of such analyses.
- G.15 When requested by the Department, the permittee shall within a reasonable time furnish any information required by law which is needed to determine compliance with the permit. If the permittee becomes aware that relevant facts were not submitted or were incorrect in the permit application or in any report to the Department, such facts or information shall be corrected promptly.



## APPENDIX CSC

### EMISSION UNIT(S) COMMON SPECIFIC CONDITIONS

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#### SUBSECTION 1.0 CONSTRUCTION REQUIREMENTS

- 1.1 Applicable Regulations: Unless otherwise indicated in this permit, the construction and operation of the subject emission unit(s) shall be in accordance with the capacities and specifications stated in the application. The facility is subject to all applicable provisions of Chapter 403, F.S and Florida Administrative Code Chapters 62-4, 62-103, 62-204, 62-210, 62-212, 62-213, 62-296, 62-297; and the applicable requirements of the Code of Federal Regulations Section 40, Part 60, adopted by reference in the Florida Administrative Code regulation [**Rule 62-204.800, F.A.C.**]. Issuance of this permit does not relieve the facility owner or operator from compliance with any applicable federal, state, or local permitting requirements or regulations. [**Rule 62-210.300, F.A.C.**]

#### SUBSECTION 2.0 EMISSION LIMITING STANDARDS

- 2.1 General Particulate Emission Limiting Standards. General Visible Emissions Standard: Except for emissions units that are subject to a particulate matter or opacity limit set forth or established by rule and reflected by conditions in this permit, no person shall cause, let, permit, suffer, or allow to be discharged into the atmosphere the emissions of air pollutants from any activity, the density of which is equal to or greater than that designated as Number 1 on the Ringelmann Chart (20% opacity). [**Rule 62-296-320(4)(b)1, F.A.C.**]
- 2.2 Unconfined Emissions of Particulate Matter [**Rule 62-296.320(4)(c), F.A.C.**]
- (a) The owner or operators shall not cause, let, permit, suffer or allow the emissions of unconfined particulate matter from any source whatsoever, including, but not limited to, vehicular movement, transportation of materials, construction, alteration, demolition or wrecking, or industrially related activities such as loading, unloading, storing or handling, without taking reasonable precautions to prevent such emission.
- (b) Any permit issued to a facility with emissions of unconfined particulate matter shall specify the reasonable precautions to be taken by that facility to control the emissions of unconfined particulate matter.
- (c) Reasonable precautions include the following:
- Paving and maintenance of roads, parking areas and yards.
  - Application of water or chemicals to control emissions from such activities as demolition of buildings, grading roads, construction, and land clearing.
  - Application of asphalt, water, oil, chemicals or other dust suppressants to unpaved roads, yards, open stock piles and similar activities.
  - Removal of particulate matter from roads and other paved areas under the control of the owner or operator of the facility to prevent reentrainment, and from buildings or work areas to prevent particulate from becoming airborne.
  - Landscaping or planting of vegetation.
  - Use of hoods, fans, filters, and similar equipment to contain, capture and/or vent particulate matter.

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- Confining abrasive blasting where possible.
- Enclosure or covering of conveyor systems.

*NOTE: Facilities that cause frequent, valid complaints may be required by the Permitting Authority to take these or other reasonable precautions. In determining what constitutes reasonable precautions for a particular source, the Department shall consider the cost of the control technique or work practice, the environmental impacts of the technique or practice, and the degree of reduction of emissions expected from a particular technique or practice.*

#### 2.3 General Pollutant Emission Limiting Standards: [Rule 62-296.320, F.A.C.]

- (a) The owner or operator shall not store, pump, handle, process, load, unload or use in any process or installation, volatile organic compounds or organic solvents without applying known and existing vapor emission control devices or systems.
- (b) No person shall cause, suffer, allow or permit the discharge of air pollutants which cause or contribute to an objectionable odor.

*NOTE: An objectionable odor is defined as any odor present in the outdoor atmosphere which by itself or in combination with other odors, is or may be harmful or injurious to human health or welfare, which unreasonably interferes with the comfortable use and enjoyment of life or property, or which creates a nuisance. [F.A.C. 62-210.26(198)]*

### SUBSECTION 3.0 OPERATION AND MAINTENANCE

- 3.1 Changes/Modifications: The owner or operator shall submit to the Permitting Authority(s), for review any changes in, or modifications to: the method of operation; process or pollution control equipment; increase in hours of operation; equipment capacities; or any change which would result in an increase in potential/actual emissions. Depending on the size and scope of the modification, it may be necessary to submit an application for, and obtain, an air construction permit prior to making the desired change. *Routine maintenance of equipment will not constitute a modification of this permit.* [Rule 62-4.030, 62-210.300 and 62-4.070(3), F.A.C.]
- 3.2 Plant Operation - Problems: If temporarily unable to comply with any of the conditions of the permit due to breakdown of equipment or destruction by fire, wind or other cause, the owner or operator shall notify the Permitting Authority as soon as possible, but at least within (1) working day, excluding weekends and holidays. The notification shall include: pertinent information as to the cause of the problem; the steps being taken to correct the problem and prevent future recurrence; and where applicable, the owner's intent toward reconstruction of destroyed facilities. Such notification does not release the permittee from any liability for failure to comply with the conditions of this permit and the regulations. [Rule 62-4.130, F.A.C.]

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### EMISSION UNIT(S) COMMON SPECIFIC CONDITIONS

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- 3.3 Circumvention: The owner or operator shall not circumvent the air pollution control equipment or allow the emission of air pollutants without this equipment operating properly. [Rules 62-210.650, F.A.C.]
- 3.4 Excess Emissions Requirements [Rule 62-210.700, F.A.C.]
- (a) Excess emissions resulting from start-up, shutdown or malfunction of these emissions units shall be permitted providing (1) best operational practices to minimize emissions are adhered to and (2) the duration of excess emissions shall be minimized, but in no case exceed two hours in any 24 hour period unless specifically authorized by the Permitting Authority office for longer duration. [Rule 62-210.700(1), F.A.C.]
  - (b) Excess emissions that are caused entirely or in part by poor maintenance, poor operation, or any other equipment or process failure that may reasonably be prevented during start-up, shutdown, or malfunction shall be prohibited. [Rule 62-210.700(4), F.A.C.]
  - (c) In case of excess emissions resulting from malfunctions, the owner or operator shall notify Permitting Authority within one (1) working day of: the nature, extent, and duration of the excess emissions; the cause of the problem; and the corrective actions being taken to prevent recurrence. [Rule 62-210.700(6), F.A.C.]
- 3.5 Operating Procedures: Operating procedures shall include good operating practices and proper training of all operators and supervisors. The good operating practices shall meet the guidelines and procedures as established by the equipment manufacturers. All operators (including supervisors) of air pollution control devices shall be properly trained in plant specific equipment. [Rule 62-4.070(3), F.A.C.]

#### SUBSECTION 4.0 MONITORING OF OPERATIONS

- 4.1 Determination of Process Variables
- (a) The permittee shall operate and maintain equipment and/or instruments necessary to determine process variables, such as process weight input or heat input, when such data is needed in conjunction with emissions data to determine the compliance of the emissions unit with applicable emission limiting standards.
  - (b) Equipment and/or instruments used to directly or indirectly determine such process variables, including devices such as belt scales, weigh hoppers, flow meters, and tank scales, shall be calibrated and adjusted to indicate the true value of the parameter being measured with sufficient accuracy to allow the applicable process variable to be determined within 10% of its true value. [Rule 62-297.310(5), F.A.C.]

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### EMISSION UNIT(S) COMMON SPECIFIC CONDITIONS

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#### SUBSECTION 5.0 TEST REQUIREMENTS

- 5.1 Test Performance Within 60 days after achieving the maximum production rate at which these emission units will be operated, but not later than 180 days after initial startup and annually thereafter, the owner or operator of this facility shall conduct performance test(s) pursuant to 40 CFR 60.8, Subpart A, General Provisions and 40 CFR 60, Appendix A. No other test method shall be used unless approval from the Department has been received in writing. Unless otherwise stated in the applicable emission limiting standard rule, testing of emissions shall be conducted with the emission unit(s) operating at permitted capacity pursuant to Rule 62-297.310(2), F.A.C. [Rules 62-204.800, 62-297.310, 62-297.400, 62-297.401, F.A.C.]
- 5.2 Test Procedures shall meet all applicable requirements of the Florida Administrative Code Chapter 62-297. [Rule 62-297.310, F.A.C.]
- 5.3 Test Notification: The owner or operator shall notify the Permitting Authority in writing at least (30) days (initial) and 15 days (annual) prior to each scheduled compliance test to allow witnessing. The notification shall include the compliance test date, place of such test, the expected test time, the facility contact person for the test, and the person or company conducting the test. The (30) or (15) day notification requirement may be waived at the discretion of the Department. Likewise, if circumstances prevent testing during the test window specified for the emission unit, the owner or operator may request an alternate test date before the expiration of this window. [Rule 62-297.310 and 40 CFR 60.8, F.A.C.]
- 5.4 Special Compliance Tests: When the Department, after investigation, has good reason (such as complaints, increased visible emissions or questionable maintenance of control equipment) to believe that any applicable emission standard contained in Rule 62-204, 62-210, 62-212, 62-296 and 62-297, F.A.C. or in a permit issued pursuant to those rules is being violated, it may require the owner or operator of the facility to conduct compliance tests which identify the nature and quantity of pollutant emissions from the emissions units and to provide a report on the results of said tests to the Permitting Authority. [Rule 62-297.310(7)(b), F.A.C.]
- 5.5 Stack Testing Facilities: The owner or operator shall install stack testing facilities in accordance with Rule 62-297.310(6), F.A.C..
- 5.6 Exceptions and Approval of Alternate Procedures and Requirements: An Alternate Sampling Procedure (ASP) may be requested from the Bureau of Air Monitoring and Mobile Sources of the Florida Department of Environmental Protection in accordance with the procedures specified in Rule 62-297.620, F.A.C.
- 5.7 Operating Rate During Testing: Unless otherwise stated in the applicable emission limiting standard rule, testing of emissions shall be conducted with the emissions unit operation at permitted capacity. Permitted capacity is defined as 90 to 100 percent of the maximum operation rate allowed by the permit. If it is impracticable to test at permitted capacity, an

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emissions unit may be tested at less than the minimum permitted capacity; in this case, subsequent emissions unit operation is limited to 110 percent of the test load until a new test is conducted. Once the unit is so limited, operation at higher capacities is allowed for no more than 15 consecutive days for the purpose of additional compliance testing to regain the authority to operate at the permitted capacity. [Rule 62-297.310(2) and (3), F.A.C.]

#### SUBSECTION 6.0 REPORTS AND RECORDS

- 6.1 Duration: All reports and records required by this permit shall be kept for at least (5) years from the date the information was recorded. [Rule 62-4.160(14)(b), F.A.C.]
- 6.2 Emission Compliance Stack Test Reports:
- (a) A *test report* indicating the results of the required compliance tests shall be filed with the Permitting Authority as soon as practical, but no later than 45 days after the last sampling run is completed. [Rule 62-297.310(8), F.A.C.]
  - (b) The *test report* shall provide sufficient detail on the tested emission unit and the procedures used to allow the Department to determine if the test was properly conducted and if the test results were properly computed. At a minimum, the test report shall provide the applicable information listed in Rule 62-297.310(8), F.A.C.
- 6.3 Excess Emissions Report: If excess emissions occur, the owner or operator shall notify the Permitting Authority within (1) working day of: the nature, extent, and duration of the excess emissions; the cause of the excess emissions; and the actions taken to correct the problem. In addition, the Department may request a written summary report of the incident. Pursuant to the New Source Performance Standards, excess emissions shall also be reported in accordance with 40 CFR 60.7, Subpart A. [Rules 62-4.130 and 62-210.700(6), F.A.C.]
- 6.4 Annual Operating Report for Air Pollutant Emitting Facility: Before March 1st of each year, the owner or operator shall submit to the Permitting Authority this required report [DEP Form No. 62-210.900(5)], which summarizes operations for the previous calendar year. [Rule 62-210.370(3), F.A.C.]

#### SUBSECTION 7.0 OTHER REQUIREMENTS

- 7.1 Waste Disposal: The owner or operator shall treat, store, and dispose of all liquid, solid, and hazardous wastes in accordance with all applicable Federal, State, and Local regulations. This air pollution permit does not preclude the permittee from securing any other types of required permits, licenses, or certifications.