



**STATEMENT OF BASIS**

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BAQ Engineering Services Division  
 2600 Bull Street, Columbia, SC 29201  
 Phone: 803-898-4123 Fax: 803-898-4079

<b>Company Name:</b>	Beaufort-Jasper Water & Sewer Authority – Purrysburg WTP	<b>Permit Writer:</b>	Jerry E. Freck
<b>Permit Number:</b>	1360-0042-CA	<b>Date:</b>	26 October 2009

**APPLICATION RECEIVED:** January 27, 2009, revised February 20, 2009.

**FACILITY DESCRIPTION:** This existing water treatment facility is located in Hardeeville and provides potable water to residential, commercial, and industrial customers.

**PROJECT DESCRIPTION:** The facility presently operates a single diesel-fired generator for emergency purposes only. The facility is requesting permission to use the generator for peak-shaving purposes. This change will cause the facility to become subject to Synthetic Minor limits of less than 250 NO<sub>x</sub> TPY, and a less than 100 TPY limit for Title V avoidance which will be expressed as a one operating hour limit (12-month rolling sum). The application states the diesel engine was installed in 2004, is rated 2498 bHP, consumes 156.5 fuel gallon/hour, and drives a generator rated at 2200 kWe. The site also comprises one exempt source – a fuel oil storage tank. Page 1 of the application gives tank volume as 8,000 gallons. However, data shown in the Emissions Calculations portion of the application indicates total actual volume, including vapor space, is about 1800 gallons (less than 7 m<sup>3</sup>), with about 1700 gallons being used as the maximum fuel storage capacity.

**SPECIAL CONDITIONS, MONITORING, LIMITS:** This permit specifies a limit on operating hours as a method of complying with actual emissions limitations of less than 250 and less than 100 NO<sub>x</sub> TPY. The facility must monitor and record actual operating hours and compute the 12-month rolling sum of actual operating hours on a monthly basis. Monthly and 12-month rolling sum actual operating hour data is to be reported semi-annually. The owner/operator must also maintain records demonstrating compliance with the fuel oil sulfur content limit for each batch of fuel oil received.

**PUBLIC NOTICE:** In accordance with SC Reg. 61-62.1 Section II E and G.2.a., and 4.a., this facility has requested a federally-enforceable emissions limits so the source's potential to emit qualify it as both a synthetic minor and a conditional major source. In order to be federally-enforceable, this permit will undergo provisions of SC Reg. 61-62.1 Section II N. *Public Participation Procedures*.

**EMISSIONS:** Estimated emissions were based on lb/bHP and lb/MMBtu methods and the most conservative result was used.

UNCONTROLLED POTENTIAL EMISSIONS (PROJECT ONLY)					
ID	Pollutant	lb/hr	TPY@8760 Hr/Yr	TPY@2900 Hr/Yr	Method for Estimating Emissions
-CA (PDG1)	CO	18.224	79.82	26.43	AP-42, 5 <sup>th</sup> Edition, Table 3.4-1 (10/96) Diesel fuel (SCC: 2-02-004-01) Using lb/MMBtu fuel input @ maximum fuel consumption of 156.5 gallons/hr and fuel heat content of 137,000 Btu/gallon (LHV) see the <a href="#">Emissions calculations table</a> .
	NO <sub>x</sub>	68.610	300.51	99.48	
	PM <sub>2.5</sub>	1.973	8.764	2.86	
	PM <sub>10</sub>	2.144	9.39	3.11	
	PM	2.144	9.39	3.11	
	SO <sub>2</sub>	1.083	4.74	1.57	
	VOC	1.756	7.69	2.55	

FACILITY WIDE EMISSIONS		
Pollutant	Uncontrolled Emissions	Controlled Emissions
	TPY	TPY
CO	79.82	26.43
NO <sub>x</sub>	300.51	99.48
PM <sub>2.5</sub>	8.764	2.86
PM <sub>10</sub>	9.39	3.11
PM	9.39	3.11
SO <sub>2</sub>	4.74	1.57
VOC	7.69	2.55



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**PROJECT REGULATORY APPLICABILITY REVIEW**

Regulation	Applicable		Comments
	Yes	No	
<b>South Carolina Regulation 61-62.1 through 62.99: Air Pollution Regulations (PROJECT ONLY)</b>			
<b>Section II(E): Synthetic Minor</b>	X		The “PDG1” RICE has NO <sub>x</sub> PTE that would qualify it as a PSD major source, but the facility is requesting a federally-enforceable synthetic minor limit of less than 250 NO <sub>x</sub> ton per year.
<b>Section II(G): Conditional Major</b>	X		The “PDG1” RICE has NO <sub>x</sub> PTE that would qualify it as a major source of NO <sub>x</sub> under Part 70 (Title V). However, the facility is requesting a federally-enforceable limit of less than 100 NO <sub>x</sub> ton per year to avoid Title V permitting requirements.
<b>Standard 1: Fuel Burning Operations</b>		X	The only fuel combusting source at this facility is direct-fired.
<b>Standard 2: Ambient Air Quality Standards</b>	X		The facility has demonstrated compliance with STD 2 via modeling dated August 24, 2009.
<b>Standard 3: Waste Combustion/Reduction (state only)</b>		X	No waste combustion occurs at this facility.
<b>Standard 3.1: HMI Waste Incinerators</b>		X	No medical waste incineration occurs at this facility.
<b>Standard 4: Emissions from Process Industries</b>	X		Per Section IX B., an opacity limit of 20% applies to stationary RICE constructed after 31 DEC 1985.
<b>Standard 5: Volatile Organic Compounds</b>		X	This facility has no existing processes covered by the regulation.
<b>Standard 5.1: BACT/LAER For VOC (state only)</b>		X	The facility-wide net VOC emissions increase less than 100 tons per year
<b>Standard 5.2: Control of Oxides of Nitrogen</b>		X	The facility’s application states the stationary RICE-driven generator was constructed prior to the 25 June 2004 applicability date for new sources.
<b>Standard 7: Prevention of Significant Deterioration</b>		X	The “PDG1” RICE has NO <sub>x</sub> PTE that would qualify it as a PSD major source, but the facility is requesting a federally-enforceable limit of less than 250 NO <sub>x</sub> ton per year to avoid PSD permitting requirements.
<b>Standard 7(c): Ambient Air Increments</b>	X		MSBD’s have been set for Beaufort County for PM <sub>10</sub> and SO <sub>2</sub> . The facility has demonstrated compliance with STD 7(c) via modeling.
<b>Standard 7.1: Standards for Non Attainment Areas</b>		X	Beaufort County is in attainment for PM <sub>10</sub> and SO <sub>2</sub> .
<b>Standard 8: Toxic Air Pollutants (state only)</b>		X	Virgin fuel combustion is exempt from STD 8.
<b>Regulation 61-62.6: Control of Fugitive Particulate Matter</b>		X	This project does not comprise sources of fugitive PM
<b>Regulation 61-62.60: SC Designated Facility Plan and NSPS</b>		X	This unit was manufactured and installed before the 11 July 2005 applicability date under NSPS Subpart IIII at 40CFR60.4200(a)(3), and this site is not one of the designated facilities.
<b>Regulation 61-62.61: NESHAP</b>		X	This project involves none of the stationary sources for which a standard is prescribed under this part.
<b>Regulation 61-62.63: NESHAP For Source Categories</b>	X		The potential HAP emissions are less than “major” thresholds, so the facility is an area source of HAP. See the MACT section of this document for more discussion.
<b>Regulation 61-62.68: Chemical Accident Prevention</b>		X	This process does not store or use chemicals subject to 112(r) above the threshold quantities.



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<b>PROJECT REGULATORY APPLICABILITY REVIEW</b>			
<b>Regulation</b>	<b>Applicable</b>		<b>Comments</b>
	<b>Yes</b>	<b>No</b>	
<b>Regulation 61-62.70:</b> Title V		X	The “PDG1” RICE has NO <sub>x</sub> PTE that would qualify it as a major source of NO <sub>x</sub> under Part 70 (Title V). However, the facility is requesting a federally-enforceable limit of less than 100 NO <sub>x</sub> ton per year to avoid Title V permitting requirements.
<b>Regulation 61-62.72:</b> Acid Rain		X	The “PDG1” generator output capacity is less than 25 MWe
<b>Regulation 61-62.96:</b> Nitrogen Oxides (NO <sub>x</sub> ) Budget Trading Program		X	The “PDG1” generator output capacity is less than 25 MWe and heat input capacity is less than 250 MMBtu/Hr. Therefore, it is not a CAIR unit.
<b>Regulation 61-62.99:</b> Nitrogen Oxides (NO <sub>x</sub> ) Budget Program Requirements for Stationary Sources Not In the Trading Program		X	This project involves no kilns.
<b>Federal Regulations (PROJECT ONLY)</b>			
NSPS (Part 60) Subpart(s)		X	The applicant states the unit was manufactured and installed before the 11 July 2005 applicability date under 40CFR60.4200(a)(3). Capacity of the fuel storage tank is below the 75 m <sup>3</sup> applicability threshold under NSPS Subpart Kb at 40CFR60.110b(a)
NESHAP (Part 61) Subpart(s)		X	This project involves none of the stationary sources for which a standard is prescribed under this part.
MACT (Part 63) Subpart(s)		X	This project incorporates no a major sources of HAP.
Area Source Standards (Part 63) Subpart(s)	X		This facility is an area source of HAP. “PDG1” is subject to Subpart ZZZZ per 40CFR63.6585(d), but will have no substantive requirements (see MACT section below).
Compliance Assurance Monitoring (CAM) (Part 64)		X	The “PDG1” RICE is avoiding major status for NO <sub>x</sub> because the facility is accepting a federally-enforceable limit of less than 100 NO <sub>x</sub> TPY to avoid being classed as such.
Other (Parts 89, 1039, 1048, and 1068)		X	See OTHER discussion below.

**Standard 5.2:**

Per Section II – Definitions, “constructed” means the on-site fabrication, erection, or installation of the NO<sub>x</sub> emitting source. The applicant states the source was installed prior to 25 June 2004. This project involves no new fabrication, erection, or installation, so applicability to 5.2 is not triggered by this project.

**NSPS**

- 40 CFR 60 Subpart IIII - Standards Of Performance For Stationary Compression Ignition Internal Combustion Engines

The “PDG1” diesel generator meets the definition of a stationary compression ignition ICE at §60.4219 and the unit was constructed in 2004, which precedes the applicability dates of Subpart IIII at §60.4200(a).

This project is not considered a modification in the context of NSPS. Per §60.14(a), (e), a modification is defined as “any physical or operational change to an existing facility which results in an increase in the emission rate to the atmosphere of any pollutant to which a standard applies”, and “the following shall not, by themselves, be considered modifications under this part:... an increase in production rate of an existing facility, if that increase can be accomplished without a capital expenditure on that facility...an increase in the hours of operation.” Operational changes being allowed by this project align with aspects that are not to be considered modification under NSPS and change from emergency use to peak shaving does not result in an increase in short term emission rates.



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- 40 CFR 60 Subpart JJJJ - Standards Of Performance For Stationary Spark Ignition Internal Combustion Engines

The “PDG1” diesel generator does not fit the definition of a stationary spark ignition ICE at §60.4248 or the applicability requirements of Subpart JJJJ at §60.4230(a).

**MACT**

- 40 CFR 63 Subpart ZZZZ - National Emission Standards For Hazardous Air Pollutants For Stationary Reciprocating Internal Combustion Engines.

Since the “PDG1” diesel generator is an area source of HAP, and it meets the definition of a stationary compression ignition RICE per §63.6675, it is subject to Subpart ZZZZ as per §63.6585(d). However, because the unit is located at an area source of HAP and was constructed before 12 June 2006, it meets the definition of an “existing stationary RICE” at §63.6590(a)(1)(iii).

In accordance with §63.6590(b)(3), the “PDG1” diesel generator will have no requirements under 40 CFR 63 Subpart ZZZZ: A stationary RICE which is ... an existing compression ignition (CI) stationary RICE... does not have to meet the requirements of this subpart and of subpart A of this part. No initial notification is necessary.

**OTHER**

- 40 CFR 89 - Control Of Emissions From New And In-Use Nonroad Compression-Ignition Engines.

The “PDG1” generator is a stationary source because it will remain on location for more than 12 consecutive months. Therefore, the unit does not meet the definition of a “compression-ignition nonroad engine” at 40CFR89.2, or the applicability criteria of 40CFR89.1(a).

- 40 CFR 1039 - Control Of Emissions From New And In-Use Nonroad Compression-Ignition Engines

The “PDG1 diesel generator unit is a stationary source that does not meet the definition of a “nonroad engine” at 40CFR1039.801, or the applicability criteria of 40CFR1039.1(a).

- 40 CFR 1048 - Control Of Emissions From New, Large Nonroad Spark-Ignition Engines

The “PDG1” diesel generator is a stationary engine that does not fit the definition of a “nonroad” spark ignition engine at §1048.801, or the applicability requirements at §1048.1(a).

- 40 CFR 1068 - General Compliance Provisions For Nonroad Programs.

The PDG1 diesel generator is a stationary source that does not meet the definition of a “nonroad engine” at 40CFR1068.30, or the applicability criteria of 40CFR89.1(a).

**SUMMARY AND CONCLUSIONS**

The applicant used fuel heat content of 135,000 Btu/gallon to estimate emissions, but AP-42 supports a value of 137,000. Modeled rates were increased slightly to account for this difference. It has been determined that this source, if operated in accordance with the submitted application, will qualify as a Conditional Major source, and can comply with all applicable requirements and emissions standards.



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**EMISSIONS:** Emissions were calculated on basis of engine HP and MMBtu emission rate factors from AP-42 Tables 3.4-1, -3, and -4. Results were compared for the most conservative allowable operating hour limit. The 100 NO<sub>x</sub> TPY limit is equivalent to 2,900 operating hours per year at maximum potential emission rates.

## Beaufort-Jasper Water & Sewer Authority - Purrysburg WTP (1360-0042-CA)

J.E. Freck - ESD/BAQ/EQC/SCDHEC - 04 August 2009

156.5	< Fuel Consumption (Gal/Hr)	"PDG1" 2498 HP, 2200 kwe; Caterpillar SR4 3516, S/N 2SN00751										
137,000	<BTU/Gal	PM	PM <sub>10</sub>	PM <sub>2.5</sub>	SO <sub>2</sub>	NO <sub>x</sub>	CO	VOC	HAP			
<b>21.4405</b>	<MMBtu/Hr	Lb/MMBtu >	0.1	0.1000	0.0920	0.0505	3.2	0.85	0.0819	0.001		
	Hr/Yr >	8760	% Sulfur: 0.05	Lb/Hr >	2.144	2.144	1.973	1.083	68.610	18.224	1.756	0.032
			PTE @ 8,760 Hr/Yr (TPY) >		9.39	9.39	8.64	4.74	<b>300.51</b>	79.82	7.69	0.14
			PTE @ <b>2,900</b> Hr/Yr (TPY) >		3.11	3.11	2.86	1.57	<b>99.48</b>	26.43	2.55	0.05

<b>2498</b>	< Maximum Rating (HP)	Lb/HP-Hr >	0.0007	0.0007	0.0006	0.0004045	0.024	0.0055	0.000705	1.28E-05		
	Hr/Yr >	8760	% Sulfur: 0.05	Lb/Hr >	1.749	1.749	1.609	1.010	59.952	13.739	1.761	0.032
			PTE @ 8,760 Hr/Yr (TPY) >		7.66	7.66	7.05	4.43	<b>262.59</b>	60.18	7.71	0.14
			PTE @ 3,336 Hr/Yr (TPY) >		2.92	2.92	2.68	1.69	<b>100.00</b>	22.92	2.94	0.05

HAP	Lb/MMBtu	Lb/Hr	TPY @8760	TPY @2900
Acetaldehyde	2.520E-05	5.403E-04	0.00	0.00
Acrolein	7.880E-06	1.690E-04	0.00	0.00
Benzene	7.760E-04	1.664E-02	0.07	0.02
Formaldehyde	7.890E-05	1.692E-03	0.01	0.00
Naphthalene	1.300E-04	2.787E-03	0.01	0.00
Toluene	2.820E-04	6.046E-03	0.03	0.01
Xylenes	1.930E-04	4.138E-03	0.02	0.01
<b>Total HAP &gt;</b>		<b>3.201E-02</b>	<b>0.14</b>	<b>0.05</b>

Source: AP-42 5th Edition  
 Tables 3.4-1, 3, & 4, 10/96 Update

### Fuel oil storage tank capacity calculations

Diameter (d) = 6.66 feet

Height (h) = 7.0 feet

Tank volume (V) = Ah = 7.0 x 34.83680 feet<sup>2</sup> = 243.857647 feet<sup>3</sup>

Tank area (A) = πr<sup>2</sup> = π(d/2)<sup>2</sup> = π(6.66/2)<sup>2</sup> = 34.83680 feet<sup>2</sup>

V = 243.857647 feet<sup>3</sup> x 7.480519 gallon/feet<sup>3</sup> = **1,824.2 gallon**

V = 1,824.2 gallon x meter<sup>3</sup>/264.1721 gallon = **6.9 meter<sup>3</sup>**