



STATEMENT OF BASIS

Title V Permit

**PREPA Palo Seco Steam Power Plant
PFE-TV-4911-70-1196-0015**

The Puerto Rico Environmental Quality Board (EQB) is issuing a Title V permit pursuant to 40 CFR Part 70 and Part VI of the Regulations for the Control of Atmospheric Pollution (RCAP) for PREPA Palo Seco Steam Power Plant (PREPA Palo Seco). PREPA Palo Seco is located in the Road #165 km 3.8 Palo Seco Ward in Toa Baja, Puerto Rico. EQB received a Title V permit application from PREPA Palo Seco on November 15, 1996. On December 10, 1996, the Air Quality Area acknowledged that the application was complete. In September 30, 2011, PREPA requested an amendment to the initial application of the Title V permit.

PREPA Palo Seco consists of ten (10) fuel combustion sources distributed in the following two plants areas: steam power plant consisting of four (4) boilers (PS1, PS2, PS3 and PS4) and the simple cycle turbines (power block) consists of six (6) combustion turbines (PSGT1-1, PSGT1-2, PSGT2-1, PSGT2-2, PSGT3-1 and PSGT3-2). The four boilers (PS1, PS2, PS3 and PS4) combust primarily no. 6 fuel oil (Bunker C) to generate electricity at a steam turbogenerator. The no. 6 fuel oil has a sulfur content of 0.5% by weight. The four boilers use propane for ignition and the sulfur content is 0.0187% by weight. The six (6) combustion turbines or gas turbines of simple cycle that combust no. 2 fuel oil to generate electricity. No. 2 fuel oil has a sulfur content of 0.5% by weight. This facility is a major source for atmospheric pollutants because it has the potential to emit more than 100 tons per year of nitrogen oxides (NO_x), sulfur oxides (SO_x), particulate matter (PM₁₀), carbon monoxide (CO) and volatile organic compounds (VOC), which are criteria atmospheric pollutants. It is also a major source of greenhouse gases (GHGs in English) because it has the potential to emit more than 100,000 tons per year, expressed as CO₂e. This facility is a major source of hazardous air pollutant emissions (total HAPs and nickel compounds).

The allowable emissions authorized under this permit are mentioned below. The source shall certify annually that its actual emissions do not exceed the allowable emissions. This certification shall be based on the actual hours of operation of the previous calendar year and using the emission factors of AP-42 (Compilation of Air Pollutant Emission Factors) effective at the time of completing the Title V application.

Pollutants	Permissible Emissions (tons /year)
PM	1,387.38
SO ₂	17,464.39
NO _x	12,276.89
CO	856.94
VOC	130.04
Lead	0.37
CO _{2e}	5,418,568.60

Hazardous Air Pollutants (HAP's)	Permissible Emissions (tons /year)
Nickel compounds	14.04
Manganese compounds	6.94
Formaldehyde compounds	7.74
Toluene	1.03
Polycyclic organic matter (POM)	0.81
Total HAP's	36.78

The following table summarizes the applicability¹ of PREPA Palo Seco with regards to the principal air pollution regulatory programs:

Regulatory Program	Applicability
RCAP- Rules 403, 406, 410 for boilers and combustion turbines	Yes
RCAP-Rule 406 for internal combustion engines	No
Hazardous Air Pollutants Limits	No
NSPS (40 CFR Part 60, Subpart GG)	No
NESHAP (MACT- 40 CFR Part 63, Subpart UUUUU)	Yes
NESHAP (MACT-40 CFR Part 63, Subpart YYYY)	No
Title V (40 CFR Part 70) and Part VI of RCAP	Yes
NSPS (40 CFR Part 60, Subpart D)	No

¹ Is important to mention that not all of the permit conditions need to be explained in this document, because the legal and factual bases for the conditions are self-evident as stated in the Title V Operating Permit. This means, that all the applicable requirements are cited in the Title V permit with a reference to the requirement. For example: if the restriction came from a construction permit, the condition will cite the construction permit number, if it came from the regulation it will cite the RCAP specific rule, and if the restriction came from a federal standard, the condition will cite the federal standard or regulation. If the restriction came from the emissions calculation and a cumulative increase, the condition will establish that. Also, state only requirements are clearly identified.

Regulatory Program	Applicability
NSPS (40 CFR Part 60, Subparte IIII)	Yes
NESHAP (MACT-40 CFR Part 63, Subpart ZZZZ)	Yes
NESHAP (MACT-40 CRF Part 63, Subpart DDDDD)	No
NESHAP (MACT-40 CRF Part 63, Subpart JJJJJJ)	No

A summary of the emission units, the applicable requirements and the rationale for these requirements are provided below.

Boilers: The capacity of the boilers PS1 and PS2 is 857.7 MMBtu/hr each boiler. The capacity of each boiler identified with PS3 and PS4 is 1,971 MMBtu/hr. The four boilers combust primarily no. 6 fuel oil (Bunker C). The four boilers have a total fuel consumption limit for no. 6 fuel oil of 330,392,160 gallons for any period of twelve (12) consecutive months. The four boilers have a total consumption limit for propane (for ignition of the boiler) of 86,623 gallons and 377,160 gallons of diesel (for warm up only) for any 12 consecutive months. No burning of solid waste or solid materials will be permitted in the boilers.

The four boilers (PS1, PS2, PS3 and PS4) shall comply with all applicable requirements of the National Emission Standards for Hazardous Air Pollutants: Coal- and Oil-Fired Electric Utility Steam Generating Units contained in Subpart UUUUU Part 63 of the Title 40 Code of Federal Regulations (40 CFR). The conditions of Subpart UUUUU, Part 63 of the 40 CFR for the four boilers are in Section V (A) of the Title V permit.

- **PM emission limit:** Rule 406 of the RCAP establishes an emission limit of 0.3 lb of particulate matter per MMBtu of heat input demonstrated by performing a stack test during the first year of the permit using EPA Test Method 5.
- **Sulfur content:** The Rule 410 of the RCAP provides for sulfur content limit in fuels (fuel oil no. 6 and propane). The no. 6 fuel oil used shall not have a sulfur content in excess of 0.5 % by weight. The propane that is used for ignition of the boilers may not have a sulfur content in excess of 0.0187% by weight. The same rule and also the permit require the sulfur content to be monitored daily and reported monthly to the Board. PREPA Palo Seco shall sample the fuels upon every delivery at the site for transfer to the storage tanks at the facility from any other source to verify sulfur content from supplier's invoice.
- **Opacity:** As required by Rule 403 of the RCAP, the units shall not exceed the opacity limit of 20% (six (6) minutes average). The permit requires one opacity reading to the

stack of each boilers during the first year of the permit using EPA Test Method 9 and subsequent visual inspections using a biweekly opacity visible emissions reader certified by a school approved by EPA or the Board.

- PREPA must comply with the applicable requirements of the National Emission Standards for Hazardous Air Pollutants: Coal- and Oil-Fired Electric Utility Steam Generating Units contained in Subpart UUUUU of 40 CFR Part 63, better known as Mercury Air Toxic Standards (MATS, in english), on or before April 16, 2015, or the date specified in the extension or extensions of compliance that are granted by the Environmental Quality Board and Federal Environmental Protection Agency pursuant to 40 CFR §63.6(i). This regulation is intended to reduce emissions of heavy metals, including mercury, arsenic, chromium, nickel and acid gases, including hydrochloric acid (HCl) and hydrofluoric acid (HF). These regulations set limits for PM emission number (as a surrogate for all toxic metals), HCl and HF. The permittee shall demonstrate compliance with the limits for HCl and HF limiting the moisture content in the liquid fuel. Also, working practices are established, instead of numerical limits, to limit emissions of toxic organics, including dioxins and furans. Because dioxins and furans are the result of inefficient combustion, the standards applicable work practice require an annual performance test program for each unit, which includes inspection, adjustment and / or maintenance and repairs to ensure optimal combustion in each unit. PREPA Palo Seco has requested to designate as limited use, the PS1 and PS2 boilers, the requirements of work practices that would apply are cited in the permit.

Combustion turbines: The capacity of each turbine (PSGT1-1, PSGT1-2, PSGT2-1, PSGT2-2, PSGT3-1 and PSGT3-2) is 301.5 MMBtu/hr and has a total fuel consumption limit for no. 2 *fuel oil* of 117,384,000 gallons for any period of twelve (12) consecutive months for the six (6) oil-fired combustion turbines. The permit also requires to record and report the fuel consumption to the Board monthly. Since the units were built before October 3, 1977, no control device is required for these units by any applicable requirement and they are not affected by the New Source Performance Standards (NSPS) for Stationary Gas Turbines in 40 CFR Part 60 Subpart GG. Although no federal requirements are applicable to these units, the units are subject to following RCAP limitations.

- PM emission limit: The Rule 406 of the RCAP establishes an emission limit of 0.3 lb of particulate matter per MMBtu of heat input demonstrated by the type of fuel and AP-42 (Compilation of Air Pollutant Emission Factors) emission factors to the unit.

- Sulfur content: Rule 410 of the RCAP provides for sulfur content limit in fuel. The no. 2 fuel oil used shall not have a sulfur content which exceeds 0.5 % by weight. The same rule and also the permit require the sulfur content to be monitored daily and reported to the Board monthly. PREPA Palo Seco shall sample the fuel upon every delivery at the site for transfer to the storage tanks at the facility from any other source to verify sulfur content from supplier's invoice.
- Opacity: As required by Rule 403 of the RCAP, the units shall not exceed the opacity limit of 20% (six (6) minutes average), except for one period of not more than four (4) minutes in any consecutive 30 minutes interval when the opacity shall not exceed 60%. The permit requires one opacity reading to the stack of each combustion turbine during the first year of the permit using EPA Test Method 9 and subsequent visual inspections using biweekly opacity visible emissions reader certified by a school approved by EPA or the Board.
- National Emission Standards for Hazardous Air Pollutants for combustion turbines contained in 40 CFR Part 63, Subpart YYYY: Any existing, new, or reconstructed source that have or operates stationary combustion turbines, is subject to the National Emission Standards for Hazardous Air Pollutants for Combustion Turbines contained in 40 CFR Part 63, Subpart YYYY.
 - a. According to 40 CFR section 63.6090, the existing stationary combustion turbines in all subcategories does not have to comply with the requirements of this Subpart YYYY or 40 CFR Part 63 Subpart A. No initial notification is necessary for any existing internal stationary combustion turbine, even if a new or reconstructed turbine in the same category would require an initial notification.
 - b. If a turbine was reconstructed built and began operations after March 4, 2004, the unit must meet the applicable requirements of emission limits and /or operating limitations of this Subpart YYYY on the date of commencement of operations.

Electricity Generators:

Electricity generators are GE-PS-1, GE-PS-2 and GE-GIS-PS-1 will be used only for emergencies. The engine power of the electricity generators (GE-PS-1 and GE-PS-2) is 765 hp. The engine power of electricity generator GE-GIS-PS-1 is 385 hp. The fuel engines use

no. 2 fuel oil and will be limited to operate maximum 500 hours each of the unit for any period of 12 consecutive months. According to the RCAP, the units cannot discharge visible emissions opacity greater than 20% on average 6 minutes. The permit also requires that register and sulfur content and fuel consumption report to the Board monthly. The engines are also affected by the following federal regulations:

- National Emissions Standards for Hazardous Air Pollutants for Stationary Reciprocating Internal Combustion Engines (40 CFR Part 63 Subpart ZZZZ): The engines of the units GE-PS-1 and GE-PS-2 shall comply with the requirements of Subpart ZZZZ. The engine of the unit GE-GIS-PS-1 unit shall fulfill with the requirements of Subpart ZZZZ complying with the requirements of 40 CFR Part 60 Subpart IIII.
- National Emissions Standards of Performance for New Stationary Sources Compression Ignition Internal Combustion Engines (40 CFR Parte 60 Subpart IIII): Under this subpart, the engine of the unit GE-GIS-PS-1 must comply with the emission limits established for NMHC + NO_x, CO, and PM throughout the life of the engine. Also the sulfur content is limited to 0.0015% by weight and cetane index of 40 (minimum) or the aromatic content is limited to 35% volume (maximum)

Fire Protection System Pump:

The power of the fire protection system pump (BI-PS-1) is 208 hp. The engine will use no. 2 fuel oil and shall be limited to operate 500 hours for any period of twelve (12) consecutive months.

- National Emissions Standards for Hazardous Air Pollutants for Internal Combustion Engines (40 CFR Part 63 Subpart ZZZZ): The engine of the unit BI-PS-1 shall fulfill with the requirements of Subpart ZZZZ complying with the requirements of 40 CFR Part 60 Subpart IIII.
- National Emissions Standards of Performance for New Stationary Sources Compression Ignition Internal Combustion Engines (40 CFR Parte 60 Subpart IIII): Under this subpart, the engine of the unit BI-PS-1 must comply with the emission limits established for NMHC + NO_x, CO, and PM throughout the life of the engine. Also the sulfur content is limited to 0.0015% by weight and cetane index of 40 (minimum) or the aromatic content is limited to 35% volume (maximum).

All the monitoring, record keeping, and reporting provisions are applicable pursuant to Rule 603 of the RCAP that requires that these elements shall be included in the Title V permit issued.

As established in Appendix B of the RCAP, PREPA Palo Seco provided a list of insignificant activities (Section VIII of the permit) (storage tanks, fuel oil and light oil discharge docks, six gas turbine fuel tank, etc) because of size or production rate.

EQB found that PREPA Palo Seco Steam Power Plant Title V permit (owned by Puerto Rico Electric Power Authority) satisfies the requirements of Part VI of the RCAP.

AI