



Section I - SCAQMD BACT Determination

Source Type: **Major/LAER**
 Application No.: **579955**
 Equipment Category: **Gas Turbine**
 Equipment Subcategory: **Combined Cycle**
 Date: **March 8, 2018**

1. EQUIPMENT INFORMATION

A. MANUFACTURER: General Electric		B. MODEL: LM6000 PG SPRINT	
C. DESCRIPTION: Combined Cycle with SCR, Oxidation catalyst, water injection and Steam Turbine (ST-5), Shinn Nippon, model C8-R11-RX			
D. FUNCTION: The City of Pasadena owns and operates the Glenarm Power Plant in Pasadena. This newly installed unit is identified as Gas Turbine 5 (GT-5).			
E. SIZE/DIMENSIONS/CAPACITY: Generator serving GT-5 is 56.1MW and 14.7MW for ST-5			
COMBUSTION SOURCES			
F. MAXIMUM HEAT INPUT: 547.5 MMBtu/hr HHV Gas Turbine			
G. BURNER INFORMATION			
TYPE		INDIVIDUAL HEAT INPUT	
NUMBER			
Make and model of burner		Rated heat input of single burner, in btu/hr	
Number of burners			
Enter additional burner types, as needed, add extra rows			
H. PRIMARY FUEL: NATURAL GAS		I. OTHER FUEL: N/A	
J. OPERATING SCHEDULE: Hours 24 Days 7 Weeks 52			
K. EQUIPMENT COST:			
L. EQUIPMENT INFORMATION COMMENTS:			

2. COMPANY INFORMATION

A. COMPANY: Pasadena City, DWP		B. FAC ID: 800168	
C. ADDRESS: 72 E. Glenarm Street CITY: Pasadena STATE: CA ZIP: 91105		D. NAICS CODE: 221112	
E. CONTACT PERSON: Dan Angeles		F. TITLE: Principal Engineer	
G. PHONE NO.: (626) 744-7598		H. EMAIL: E-mail address of contact person	

3. PERMIT INFORMATION

A. AGENCY: SCAQMD	B. APPLICATION TYPE: NEW CONSTRUCTION
C. SCAQMD ENGINEER: Li Chen	
D. PERMIT INFORMATION: PC ISSUANCE DATE: 5/4/16 P/O NO.: G50946 PO ISSUANCE DATE: 3/1/2018	
E. START-UP DATE: 7/4/2016	
F. OPERATIONAL TIME: 1.5 years	

4. EMISSION INFORMATION

A. BACT EMISSION LIMITS AND AVERAGING TIMES: List all criteria contaminant or precursor emission limits, including facility limits, on the permit(s) that affects the equipment. Include units, averaging times and corrections (% O ₂ , % CO ₂ , dry, etc). For VOC, values must include if the concentration is reported as methane, hexane or any other compound. VOC mass emissions should include the molecular weight-to-carbon ratio, if applicable.						
	VOC	NOx	SOx	CO	PM OR PM₁₀	INORGANIC
BACT Limit	2 PPMV	2 PPMV		2 PPMV		5 PPMV NH ₃
Averaging Time	1 HOUR	1 HOUR		1 HOUR		1 HOUR
Correction	@ 15% O ₂	@ 15% O ₂		@ 15% O ₂		@ 15% O ₂
B. OTHER BACT REQUIREMENTS: The emission limits shall not apply during turbine commissioning, start-up, shutdown, Water Injection and Intercooler Tuning (WIIT), and Ammonia Injection Grid Tuning (AIGT) periods. Start-up time shall not exceed 120 minutes for each start-up. Shutdown periods shall not exceed 60 minutes for each shutdown. The turbine shall be limited to a maximum of 5 start-ups per day, 155 start-ups per month, and 750 start-ups per year.						
C. BASIS OF THE BACT/LAER DETERMINATION: Achieved in Practice/New Technology						

4. EMISSION INFORMATION

D. EMISSION INFORMATION COMMENTS: Although the following mass emission limits may be specific to this project they were also included in the permit:

NOx: 28.68 lbs. {The mass emission limit shall be determined for START-UP using CEMS minute by minute emission data. It shall be calculated to 120 minutes from the commencement of initial fire in the combustor.}

NOx: 11.78 lbs. {The mass emission limit shall be determined for SHUTDOWN using CEMS minute by minute emission data. It shall be calculated to 60 minutes counted back from the cessation of firing.}

NOx: 9.80 lbs. {The mass emission limit for the alternate compliance demonstration shall be determined for SHUTDOWN using CEMS minute by minute emission data. It shall be calculated from initiation of the SHUTDOWN sequence to the cessation of firing.}

CO: 23.61 lbs. {The mass emission limit shall be determined for START-UP using CEMS minute by minute emission data. It shall be calculated to 120 minutes from the commencement of initial fire in the combustor.}

CO: 9.90 lbs. {The mass emission limit shall be determined for SHUTDOWN using CEMS minute by minute emission data. It shall be calculated to 60 minutes counted back from the cessation of firing.}

CO: 8.70 lbs. {The mass emission limit for the alternate compliance demonstration shall be determined for SHUTDOWN using CEMS minute by minute emission data. It shall be calculated from initiation of the SHUTDOWN sequence to the cessation of firing.}

5. CONTROL TECHNOLOGY

A. MANUFACTURER: Haldor Topsoe (SCR) & Emerchem (Oxidation Catalyst)		B. MODEL: GT-301 (SCR) & ADCAT (Oxidation Catalyst)	
C. DESCRIPTION: Aqueous ammonia injection grid			
D. SIZE/DIMENSIONS/CAPACITY: SCR catalyst volume 848 cu.ft. / Oxidation Catalyst fixed bed platinum, volume 100 cu.ft.			
E. CONTROL EQUIPMENT PERMIT INFORMATION: APPLICATION NO. 538120 PC ISSUANCE DATE: 5/4/16 PO NO.: G50947 PO ISSUANCE DATE: 3/1/2018			
F. REQUIRED CONTROL EFFICIENCIES: See Emission Information in Section 4.			
CONTAMINANT	OVERALL CONTROL EFFICIENCY	CONTROL DEVICE EFFICIENCY	COLLECTION EFFICIENCY
VOC	___%	___%	___%
NO _x	___%	___%	___%
SO _x	___%	___%	___%
CO	___%	___%	___%
PM	___%	___%	___%
PM ₁₀	___%	___%	___%
INORGANIC	___%	___%	___%
G. CONTROL TECHNOLOGY COMMENTS Enter comments for additional information regarding Control Technology.			

6. DEMONSTRATION OF COMPLIANCE

A. COMPLIANCE DEMONSTRATED BY: Source Test
B. DATE(S) OF SOURCE TEST: December 5-8, 2016
C. COLLECTION EFFICIENCY METHOD: N/A
D. COLLECTION EFFICIENCY PARAMETERS: N/A
E. SOURCE TEST/PERFORMANCE DATA: 1.84 PPMV NO _x @15% O ₂ . 1.02 PPMV CO @15% O ₂ . 2.8 PPMV NH ₃ @15% O ₂
F. TEST OPERATING PARAMETERS AND CONDITIONS: NO _x , CO & VOC tested at 50%, 75% and 100% load. PM & SO _x tested at 100% load.
G. TEST METHODS (SPECIFY AGENCY): SCAQMD Methods 100.1, 207.1 5.1, 25.3 and 307.91.
H. MONITORING AND TESTING REQUIREMENTS: Source testing every 3 years pursuant to Permit Condition D29.2 and CEMS for NO _x and CO.

I. DEMONSTRATION OF COMPLIANCE COMMENTS: Enter comments for additional information for Demonstration of Compliance.

7. ADDITIONAL SCAQMD REFERENCE DATA

A. BCAT: 033709	B. CCAT: 81	C. APPLICATION TYPE CODE: 60	
D. RECLAIM FAC? YES <input checked="" type="checkbox"/> NO <input type="checkbox"/>	E. TITLE V FAC: YES <input checked="" type="checkbox"/> NO <input type="checkbox"/>	F. SOURCE TEST ID(S): R17063	
G. SCAQMD SOURCE SPECIFIC RULES: Click here to enter text.			
H. HEALTH RISK FOR PERMIT UNIT			
H1. MICR: Click here to enter text.	H2. MICR DATE: Click here to enter a date.	H3. CANCER BURDEN: Click here to enter text.	H4. CB DATE: Click here to enter a date.
H5: HIA: Click here to enter text.	H6. HIA DATE: Click here to enter a date.	H7. HIC: Click here to enter text.	H8. HIC DATE: Click here to enter a date.

