TITLE I/TITLE V APPLICATION

PEARL CROSSING LNG TERMINAL LLC

TITLE I/TITLE V PERMIT APPLICATION

MAY 2004

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1.0 INTRODUCTION

Pearl Crossing LNG Terminal LLC (Pearl Crossing LNG) is proposing to install and operate a liquefied natural gas (LNG) receiving, storage, and regasification terminal that will be fabricated at a graving dock and then floated and towed to its permanent location in federal waters (Gulf of Mexico, Outer Continental Shelf [OCS] Block West Cameron [WC]-220).

LNG will be offloaded from carrier vessels as a cryogenic liquid at atmospheric pressure into storage tanks at the Terminal. LNG regasification will be accomplished by using open rack vaporizers (ORVs). Each ORV will heat the LNG by exchanging heat with seawater. Seawater will be pumped to the top of each ORV by electric-powered seawater lift pumps, seawater will then flow down the outside of the panels. The LNG flowing upward through the tubes inside the panels will be warmed to at least 35°F (1.7°C), effectively regasifying the LNG. No air pollutants will be emitted from the ORVs. The terminal will include four gas turbine-driven generators, equipped with low NOx burners, for the supply of electrical power for the total requirements of the terminal and one backup diesel generator to provide essential power requirements in the event of an emergency. Other equipment at the Terminal will include diesel engine-driven firewater pumps and a high and low pressure flare system.

Pearl Crossing LNG seeks a combined minor source construction permit under Title I of the federal Clean Air Act (CAA) and operating permit under Title V of the CAA pursuant to procedures developed by the U.S. Environmental Protection Agency (EPA) Region 6 under the Deepwater Port Act (DWPA).

Table 1-1 is the summary of stationary emission sources and emission rates for the Pearl Crossing LNG Terminal during normal operations. Table 3-1 presents the ambient air modeling results. Completed Part 71 forms for this project are provided in Appendix A. Supporting calculations for these emissions estimates are presented in Appendix B, and supporting documentation for air quality modeling analyses is provided in Appendix C.

Table 1-1 Summary of Emissions Estimates for Stationary Sources at the Pearl Crossing LNG Terminal

Pearl Crossing LNG Terminal

Operation Emissions Summary

EQUIPMENT	MAXIMUM POUNDS PER HOUR					ESTIMATED TONS PER YEAR				
	PM	SO_x	NO_x	VOC	CO	PM	SO_x	NO_x	VOC	CO
Four 500-hp Firewater Pump Engines (CAT 3406)	4.4	6.47	61.73	4.94	13.36	0.4	0.57	5.40	0.43	1.17
Four 15,209-hp SOLAR Titan 130 Turbine Generators	3.3	Neg	48.5	16.3	58.9	12.95	Neg	192.3	66.7	233.54
Essential Services Generator (CAT 3612)	2.60	11.94	89.44	2.68	19.51	0.6	2.58	19.32	0.58	4.21
MISC.										
Diesel Storage Tank Breathing & Working Losses				0.00125					0.01	
Low-Pressure Flare*		Neg	0.34	0.70	1.86		Neg	1.50	3.08	8.14
Flare Pilots		Neg	0.07	0.14	0.36		0.00	0.19	0.60	1.02
High-Pressure Flare		Neg	14.88	30.64	80.97		0.00	0.10	0.23	0.55
Fugitives				0.26					1.13	
TOTALS TPY						**13.90**	**3.15**	**218.94**	**72.78**	**249.24**

*The hourly emissions from the low-pressure flare were estimated using average low-pressure flare throughput, because hourly maximum throughput values were not available.
CO = carbon monoxide
hp = horsepower
NO_x = nitrogen oxides
PM = particulate matter
SO_x = sulfur oxides
VOC = volatile organic compound
Neg = negligible

2.0 EMISSION CALCULATIONS

Calculations were completed using a standardized approach (i.e., standardized emissions calculation form, Office of Management and Budget [OMB] Control No. 1010-0049), as adopted by the U.S. Department of the Interior, Minerals Management Service (MMS) to calculate emissions from offshore oil and gas facilities (e.g., platforms). The standard calculation form has been further modified for this application to account for terminal-specific equipment, as appropriate.

Emission Factors

Emission factors were compiled either from the latest AP-42 references, or from industry studies if no AP-42 reference was available. For the gas turbine generators, manufacturer's performance specifications have been acquired and integrated into the emissions calculations. Data and assumptions used in estimating emissions for other equipment types at the proposed terminal are provided below.

Diesel-Fired Prime Movers (for emergency generator and fire water pumps)

1) Diesel sulfur level 0.4 percent by weight.
2) For diesel engines rated at greater than 600 horsepower (hp), emission factors have been based on AP-42 Table II-3-3.
3) For diesel engines, the reported volatile organic compound (VOC) emissions equal total organic (TOC) emissions.

Gas Turbine Generators

1) Gas sulfur content of LNG is negligible.
2) NO_x, VOC, and CO based on vendor performance data.
3) PM_{10} emission estimates based on AP-42.

Gas Flares

1) Non-smoking flare.
2) A heating value of 1,050 British thermal units per cubic foot (Btu/cu. ft.) for natural gas.
3) Gas sulfur content of LNG is negligible.

Tanks

1) Emissions estimates for the small diesel storage tank have assumed an uncontrolled fixed roof tank.

Fugitives

1) Facility-wide fugitive VOC emissions from leaking components are based on guidance from EPA guidance document EPA-453/R-95-017, Protocol for Equipment Leak Emission Estimates. Component counts for another similar facility were used and scaled linearly to the projected facility throughput.

Federally Enforceable Limits on Operations

For purposes of calculating potential to emit (PTE), not all equipment is assumed to be operating continuously. Operational limitations are requested in Section G of Form GIS (Appendix A) to make these limitations federally enforceable.

A total of four gas turbines are being permitted, but one will normally be used as a standby unit. At any given time, three turbines will be operating, with the fourth turbine at rest. The intention, however, is that the four turbines will be operated in any combination necessary, but with the total number of operating engine hours per year limited to 31,730. This will allow for swapping individual turbines in and out of service throughout the year for maintenance purposes.

Operational limits are also requested for the emergency firewater pumps, which combined are assumed to operate no more than 700 hours per year, and for the emergency generator (essential services), to operate up to 432 hours per year to accommodate testing to ensure their operability in an emergency.

3.0 REGULATORY APPLICABILITY

3.1 TITLE I

National Ambient Air Quality Standards (NAAQS)

Federal and state regulations protect ambient air quality. Pursuant to Title I of the CAA, EPA has developed primary and secondary National Ambient Air Quality Standards (NAAQS) for six criteria pollutants including: ozone, nitrogen dioxide (NO_2), carbon monoxide (CO), sulfur dioxide (SO_2), and particulate matter less than 10 microns (PM_{10}) and less than 2.5 microns ($PM_{2.5}$). Areas of the country that are currently in violation of the NAAQS are classified as nonattainment areas. New major sources in these areas are subject to Nonattainment New Source Review (NNSR) permitting for the criteria pollutants or precursors for which they are major. The coastal parishes of Louisiana closest to the proposed Pearl Crossing LNG Terminal are designated as attainment for all criteria pollutants. New major sources in attainment areas are subject to Prevention of Significant Deterioration (PSD) permitting.

The MMS and EPA review proposed new or modified pollutant sources located in OCS waters to evaluate potential impacts on onshore air quality, including whether the proposed source will contribute to any violation of the NAAQS. EPA Region 6 has established that sources such as the proposed terminal are not sources subject to OCS regulations. Nonetheless, OCS regulation promulgated by MMS provide a useful tool for evaluating impacts from offshore sources. MMS has codified modeling significance levels in 30 Code of Federal Regulations (CFR) § 250.303 to determine compliance with the NAAQS and PSD requirements. New facilities are required to model impacts using an approved model to determine whether the projected emissions of those air pollutants from the facility will result in an onshore ambient air concentration above the modeling significance levels. The MMS Modeling Significant Impact Levels are set at the same concentrations as the current EPA Modeling Significance Levels for new PSD sources affecting attainment areas.

Dispersion modeling using the CALPUFF Model in screening mode was conducted to evaluate the potential onshore impacts of the proposed terminal operations. As shown in Table 3-1, modeling results show that operation of the stationary sources of the proposed gravity-based structure (GBS) would result in a maximum NO_2 annual average concentration at the shoreline, 41 miles directly north of the terminal, of 0.023 micrograms per cubic meter ($\mu g/m^3$). This is significantly less than the EPA Modeling Significance Level of 1 $\mu g/m^3$. The results for other pollutants are also far below their respective significance levels.

Based on the modeling conducted, the Pearl Crossing LNG Terminal operations will not have significant impacts on onshore air quality. Therefore, further refined modeling is not required. Appendix C presents supporting information on the modeling analysis.

Table 3-1 Ambient Air Modeling Results

Pollutant	National Ambient Air Quality Standards (NAAQS)[a]					PSD Increments (μg/m³)		Modeling Significance Levels (μg/m³)	Modeled Results (maximum onshore concentration) (μg/m³)
	Averaging Period	Primary		Secondary		Class			
		(μg/m³)	(ppm)	(μg/m³)	(ppm)	I	II		
PM_{10}	Annual	50	--	50	--	4	17	1	0.0013
	24-hour	150	--	150	--	8	30	5	0.012
SO_2	Annual	(80)	0.03	--	--	2	20	1	0.00013
	24-hour	(365)	0.14	--	--	5	91	5	0.0028
	3-hour	--	--	(1,300)	0.5	25	512	25	0.0008
NO_2	Annual	(100)	0.053	(100)	0.053	2.5	25	1	0.02
CO	8-hour	(10,000)	9.0	--	--	--	--	500	0.424
	1-hour	(40,000)	35.0					2,000	0.868

[a] NAAQS are expressed in μg/m³ for particulate matter (and lead) and in parts per million (ppm) for the other pollutants. For reference, corresponding equivalent standards are shown in parentheses.

μg/m³ = micrograms per cubic meter
CO = carbon monoxide
NAAQS = National Ambient Air Quality Standards
NO_2 = nitrogen dioxide
PM_{10} = particulate matter less than 10 microns in diameter
ppm = parts per million
SO_2 = sulfur dioxide

Title I New Source Review Requirements

The DWPA provides that a deepwater port will be treated as a "new source" under the CAA. A federal review process was established by EPA Region 6 in accordance with Title I of the CAA to implement Title I for such sources. Because the proposed Pearl Crossing LNG Terminal will not be located within the boundaries of a nonattainment area, the Project will not be subject to the NNSR permitting. Rather, the Pearl Crossing LNG Terminal will be subject to PSD permitting if it constitutes a major source.

For purposes of PSD applicability, a major stationary source is defined as any source with the potential to emit (PTE):

- 100 tons per year (tpy) of any criteria pollutant if the facility category is listed in 40 CFR §52.21(b)(1)(i)(a), or
- 250 tpy of any criteria pollutant if the facility category is not listed in 40 CFR §52.21(b)(1)(i)(a)

This facility is an off-shore gas delivery system which will vaporize liquefied natural gas using regasification equipment for delivery to a downstream infrastructure. EPA has made a determination that this type of facility is not a PSD source category "fuel conversion plants" found in 40 CFR Subpart 52.21. The determination was made in the

memorandum Request for Guidance on the Definition of Fuel Conversion Plants for Purposes of Prevention of Significant Deterioration (PSD), dated July 31, 2003, from Racqueline Shelton, Group Leader, Integrated Implementation Group (OAQPS) to Guy Donaldson, Acting Chief, Air Permits Section, EPA Region 6. Specifically, this category was intended to only cover processes where chemical changes occur. The vaporization of LNG to natural gas naturally occurs at ambient temperature without the need for chemical/combustion conversion. Since the proposed facility does not fall under the listed PSD source categories, the applicable PSD threshold is 250 tpy. The combined stationary sources will have a PTE of less than 250 tpy of any criteria pollutant. Therefore, the facility will be a minor source not subject to the PSD provisions of Title I.

Emissions will be maintained below the 250-ton threshold through a restriction on the operating hours of process equipment such as the emergency generators and the gas turbines. These restrictions on operating hours will be federally enforceable limits in the permit. These types of limits render the facility a "synthetic minor" source.

Federal New Source Performance Standards

40 CFR Part 60, Subpart GG, "Standards of Performance for Stationary Gas Turbines," applies to facilities with a heat input at peak load equal to or greater than 10 million Btu per hour. Nitrogen oxide (NO_x) and SO_2 emission restrictions apply. The Pearl Crossing LNG terminal will utilize four gas turbines meeting the applicability criteria of Subpart GG. Accordingly, the turbines must:

- Comply with NO_x emission standards as specified in 40 CFR § 60.332(a)(2);
- Compute the NO_x emission rate utilizing the equation specified in 40 CFR § 60.335 (c)(1);
- Conduct initial testing of NO_x and oxygen (O_2) and any subsequent testing under the requirements of 40 CFR § 60.335(c); and
- Maintain SO_2 emissions less than 0.015 percent by volume at 15 percent oxygen on a dry basis, or only burn fuel with sulfur less than 0.8 percent by weight (40 CFR § 60.333).

40 CFR Part 60, Subpart A, "General Provisions," applies to the owner or operator of any stationary source that contains an affected facility, the construction or modification of which is commenced after the date of publication of any standard in Part 60. The general provisions under Subpart A apply to sources that are subject to the specific subpart of Part 60. Thus, the turbines are also subject to Subpart A.

National Emission Standards for Hazardous Air Pollutants

National Emission Standards for Hazardous Air Pollutants (NESHAPs), 40 CFR Parts 61 and 63, regulate the emission of hazardous air pollutants (HAPs) from existing and new sources. Each standard in 40 CFR Part 61 applies to a specific type of HAP source. However, the proposed Pearl Crossing LNG Terminal will not include any process that is regulated by 40 CFR Part 61.

40 CFR Part 63 sets forth standards for major sources of HAPs as well as some area (minor) sources of HAPs. The types of processes that will be used at the terminal are not subject to any standards that apply to area sources. On March 5, 2004, EPA published 40 CFR 63 Subpart YYYY – National Emission Standards for Hazardous Air Pollutants for Stationary Combustion Turbines. However, these rules apply only if the turbines are located at a major source of HAP emissions. Major sources are defined as sources that have the PTE:

- 10 tpy of any single HAP, or
- 25 tpy of any combination of HAPs.

The proposed facility will not have the PTE major source levels of HAPs. Thus, the Pearl Crossing LNG Terminal is not subject to 40 CFR Part 63. Calculation data indicating the estimated HAP emissions resulting from all equipment at the proposed Pearl Crossing LNG Terminal are provided in Appendix B.

3.2 TITLE V

Title V of the 1990 Amendments to the CAA required EPA to establish an Operating Permits Program. The Title V Operating Permit Program requires major sources of air pollutant emissions to obtain an operating permit. The major source thresholds triggering Title V Permit requirements are the PTE 100 tpy of any criteria pollutant, 10 tpy of any individual HAP, or 25 tpy of all HAPs combined. As shown in Table 1-1, the actual emissions, and therefore the PTE for NO_x and CO emissions is more than 100 tpy, and the proposed Pearl Crossing LNG Terminal will be a major source subject to the requirements of Title V. For these reasons, we submit Part 71 forms in Appendix A of this application.

Compliance Assurance Monitoring

In accordance with 40 CFR § 64.2(a), the Compliance Assurance Monitoring (CAM) Rule applies to each Pollutant Specific Emission Unit (PSEU) that meets a three-part test. The PSEU must be: (1) subject to an emission limitation or standard, (2) use add-on control devices to achieve compliance, and (3) have pre-control emissions that exceed or are equivalent to the Title V major source threshold. The Pearl Crossing LNG Terminal facilities are not subject to CAM requirements since the PSEUs do not use add-on control devices to achieve compliance.

3.3 STATE IMPLEMENTATION PLAN – LOUISIANA ADMINISTRATIVE CODE TITLE 33, PART III

EPA has interpreted Section 1518(b) of the DWPA to "federalize" consistent laws of the adjacent state and direct that federal officials apply them. Pursuant to Section 1502(1) of the DWPA, the Louisiana is the adjacent coastal state for the facility; therefore, Louisiana law should apply to the facility. Louisiana air quality rules that potentially apply to the proposed facility are listed below. The facility will comply with all applicable regulations.

Chapter 11 – Control of Emissions of Smoke

- Section 1101 – Control of Air Pollution from Smoke: Emissions of smoke from any combustion unit or any type of burning in a combustion unit (other than a flare) shall not exceed 20 percent opacity at any time, except in startup mode at which time one excess emission of 20 percent is allowed for one 6-minute period in any 60 consecutive minutes.
- Section 1105 – Smoke from flaring shall not exceed 20 percent opacity. Flares used to control process upsets must be controlled to limit exceedances of 20 percent opacity to less than 6 hours in any 10 consecutive days.

Chapter 13 – Emission Standards for Particulate Matter

- Section 1311.C. – Opacity is limited to 20 percent, except emissions may have an average opacity in excess of 20 percent for not more than one 6-minute period in any 60 consecutive minutes.
- Section 1313 – Emissions from Fuel-Burning Equipment – This provision does not apply, because the facilities do not include indirect heating of liquids, gases, or solids.

Chapter 15 – Emission Standards for Sulfur Dioxide

- Section 1503 – Emission Limitations – Sources emitting less than 250 tpy of SO_2 are exempt from this provision; therefore, this provision does not apply.

Chapter 21 – Control of Emissions of Organic Compounds

- Section 2103 – This rule is not applicable, because the LNG tank will contain less than 0.02 percent VOC on a mole basis and will be equipped with a vapor-recovery system to control boil-off vapors.
- Section 2115 – This provision does not apply, because the total waste gas streams at the facility will have a PTE less than 100 tpy of VOCs.

Chapter 51 – Comprehensive Toxic Air Pollutant Emission Control Program

- Section 5101 – Applicability – This chapter does not apply, because emissions will be less than 10 tpy of any toxic air pollutant (TAP) and less than 25 tpy of any combination of TAPs.

APPENDIX A

PART 71 FORMS

U.S. ENVIRONMENTAL PROTECTION AGENCY
APPLICATION FOR FEDERAL OPERATING PERMIT, 40 CFR PART 71

APPLICATION FORM GIS - GENERAL INFORMATION AND SUMMARY

Instructions: Complete this form once for the part 71 source (facility).

A. Mailing Address and Contact Information

Facility name Pearl Crossing LNG Terminal LLC

Mailing address: Street or P.O. Box 17001 Northchase

City Houston State Texas ZIP 77060 -

Contact person: Harold Yates Title

Telephone (281) 654 - 8214 Ext. Facsimile (281) 654 - 4900

B. Facility Location

Temporary source? ___ Yes X No Plant site location Offshore waters, Gulf of Mexico

City Offshore State NA County N/A EPA Region VI

Is the facility located within:

Indian lands? ___ YES X NO OCS waters? X YES ___ NO

Nonattainment area? ___ YES X NO If yes, for what air pollutants? N/A

Within 50 miles of affected State? X YES ___ NO If yes, What State(s)? Louisiana

C. Owner

Name Pearl Crossing LNG Terminal LLC Street/ P.O. Box 800 Bell Street

City Houston State Texas ZIP 77002 -

Telephone (713) 656 - 9299 Ext.

D. Operator

Name Pearl Crossing LNG Terminal LLC Street/ P.O. Box 800 Bell Street

City Houston State Texas ZIP 77002 -

Telephone (713) 656 - 9299 Ext.

E. Application Type

Instructions: Mark only one permit application type and answer the supplementary question appropriate for the type marked.

X Initial Permit ___ Permit Renewal ___ Significant Mod. ___ Minor Permit Mod. (MPM)

___ Group Processing, MPM ___ Administrative Amend.

For initial permits, when did operations commence? ____/____/2008 (estimated)

For permit renewals, what is the expiration date of the existing permit? ____/____/____

F. Applicable Requirement Summary

Instructions: Mark all applicable requirements that apply

X SIP ___ FIP/TIP ___ PSD ___ Nonattainment NSR

X Minor source NSR X Section 111 ___ Phase I acid rain ___ Phase II acid rain

___ Stratospheric ozone ___ OCS regulations ___ NESHAP ___ Sec. 112(d) MACT

___ Sec. 112(g) MACT ___ Early reduction of HAP ___ Sec. 112(j) MACT ___ RMP [Sec.112(r)]

___ Tank vessel reqt., section 183(f) ___ Section 129 Standards/Reqts.

___ Consumer/ commercial prod. reqts., section 183(e) X NAAQS, increments or visibility (for temporary sources)

Has a risk management plan been registered? ___ YES X NO Regulatory agency _____

Has a phase II acid rain application been submitted? ___ YES X NO Permitting authority_____

G. Source-Wide PTE Restrictions and Generic Applicable Rquirements

Instructions: Cite and describe (1) any emissions-limiting requirements that apply to the facility as a whole, and (2) "generic" applicable requirements that apply broadly or in an identical fashion to all sources at the facility.

(1) Four gas turbines will operate a combined maximum of 31,730 hours/year. To even out wear on the turbines, each turbine will be used in both full-time and backup service.

(2) Four diesel firewater pump engines will operate a combined maximum of 1700 hours per year (except for emergencies).

(3) Emergency generator (essential services) will operate a maximum of 5% of the time (438 hours per year).

H. Process Description

Instructions: List all processes, products, and SIC codes for normal operation, in order of priority. Also list any process, products, and SIC codes associated with any alternative operating scenarios, if different from those listed for normal operation

Process	Products	SIC
Marine cargo handling dock	Unloading Liquefied Natural Gas (LNG)	4491

I. Emission Unit Identification

Instructions: Assign an emissions unit ID and describe each significant emissions unit at the facility. Control equipment and/or alternative operating scenarios associated with emissions units should by listed on a separate line. Applicants may exclude from this list any insignificant emissions units or activities.

Emissions Unit ID	Description of Unit
GEN-001-004	4 Solar Titan 130 Turbine Generators (GEN-001, GEN-002, GEN-003, GEN-004) 15,209 HP each (with low-NO_X burner technology)
ESG-001	Essential Services Diesel Generator (Caterpillar 3612 or equivalent) - 3,688 HP
FWP-001-004	4 Firewater Pump, Diesel Engines, (FWP-001, FWP-002, FWP-003, FWP-004) (Caterpillar 3406 or equivalent) - 500 HP each
FLR-001	HP Flare 208,405 SCF/HR
FLR-002	LP Flare 4,783 SCF/HR (Average hourly rate of 838 Mcf flared over 20 years)
FLR-003	Pilots 925 SCF/HR
FUG-01	Fugitive Emissions

J. Facility Emissions Summary

Instructions: Enter potential to emit (PTE) for the facility as a whole for each air pollutant listed below. Enter the name of the single HAP emitted in the greatest amount and its PTE. For all pollutants stipulations to major source status may be indicated by entering "major" in the space for PTE. Indicate the total actual emissions for fee purposes for the facility in the space provided. Applications for permit modifications need not include actual emissions information

NOx 218.94 tons/yr VOC 70.47 tons/yr SO2 3.15 tons/yr

PM-10 13.90 tons/yr CO 249.24 tons/yr Lead -- tons/yr

Total HAP 4.25 tons/yr

Which single HAP emitted in the greatest amount? Hexane PTE? 1.69 tons/yr

Total emissions of regulated pollutants (for fee calculation) from section F, line 5 of form FEE? _____ tons/yr

K. Existing Federally Enforceable Permits:

Permit number(s) NA Permit type NA Permitting authority NA

Permit number(s) NA Permit type NA Permitting authority NA

L. Emission Unit(s) Covered by General Permits

Emission unit(s) subject to general permit NA

Check one: ___ Application made ___ Coverage granted

General permit identifier _____ Expiration Date ___/___/___

M. Cross-referenced Information

Does this application cross-reference information? ___ YES X NO (If yes, see instructions)

U.S. ENVIRONMENTAL PROTECTION AGENCY
APPLICATION FOR FEDERAL OPERATING PERMIT, 40 CFR PART 71

APPLICATION FORM IE - INSIGNIFICANT EMISSIONS

INSTRUCTIONS List each source eligible for insignificant treatment under § 71 5(c)(11)(ii) In the "number" column, indicate the number of units qualifying under each description Each description must be specific enough to describe the source of emissions. List emission units separately if they have dissimilar descriptions, including dissimilar capacities or sizes and other factors. Please check the appropriate column to indicate whether the source meets the emissions criteria under § 71 5(c)(11)(ii)(A) and (B) for regulated air pollutants except hazardous air pollutant (RAP, except HAP), and for HAP, respectively.

Number	Description of Activities or Emission Units	RAP, except HAP	HAP
1	Diesel Storage Tank (1250 bbls)	X	X
4	Diesel day tanks for firewater pumps (1320 gallons each)	X	X
1	Diesel day tanks for ESG	X	X

U S ENVIRONMENTAL PROTECTION AGENCY
APPLICATION FOR FEDERAL OPERATING PERMIT, 40 CFR PART 71

FORM EMISS - EMISSIONS CALCULATIONS

INSTRUCTIONS Use this form to calculate potential to emit (PTE) for applicability purposes and actual emissions for fee purposes for each emissions unit, control device, or alternative operating scenario identified in section I of form **GIS**. If form **FEE** does not need to be submitted with the application, do not calculate actual emissions

A. Emissions Unit ID GEN-001-004

B. Identification and Quantification of Emissions

Instructions. First, list each air pollutant that is either regulated at the unit or present in major amounts. Second, list any other regulated pollutant (for fee calculation) emitted at the unit that have not already been listed. Each HAP added to the list in this step may be simply listed as "HAP". Next, calculate PTE for applicability purposes and actual emissions for fee purposes for each listed air pollutant. Do not calculate PTE for air pollutants listed solely for fee purposes. Include all fugitives, including those that do not count towards applicability, when calculating actual emissions. At a minimum, round to the nearest tenth of a ton for yearly values or tenth of a pound for hourly values. Attach examples of calculations that illustrates the methodology used.

Air Pollutants (including regulated air pollutants and pollutants for which the source is major)	Emission Rates			CAS No
	Actual Annual Emissions (tons/yr)	Potential to Emit Hourly (lb/hr)	Potential to Emit Annual (tons/yr)	
PM10	NA	3.27	12.95	
SOx	NA	Negligible	Negligible	
NOx	NA	48.49	192.33	
VOC	NA	16.82	66.73	
CO	NA	58.88	233.54	
HAP - Formaldehyde	NA		1.39	50-00-0 (highest)
HAP - Toluene	NA	--	0.26	108-88-3 (2nd highest)
HAP - Xylenes	NA	--	0.13	1330-20-7 (3rd highest)

U.S ENVIRONMENTAL PROTECTION AGENCY
APPLICATION FOR FEDERAL OPERATING PERMIT, 40 CFR PART 71

FORM EMISS - EMISSIONS CALCULATIONS

INSTRUCTIONS: Use this form to calculate potential to emit (PTE) for applicability purposes and actual emissions for fee purposes for each emissions unit, control device, or alternative operating scenario identified in section I of form GIS. If form FEE does not need to be submitted with the application, do not calculate actual emissions.

A. Emissions Unit ID ESG-001

B. Identification and Quantification of Emissions

Instructions: First, list each air pollutant that is either regulated at the unit or present in major amounts. Second, list any other regulated pollutant (for fee calculation) emitted at the unit that have not already been listed. Each HAP added to the list in this step may be simply listed as "HAP". Next, calculate PTE for applicability purposes and actual emissions for fee purposes for each listed air pollutant. Do not calculate PTE for air pollutants listed solely for fee purposes. Include all fugitives, including those that do not count towards applicability, when calculating actual emissions. At a minimum, round to the nearest tenth of a ton for yearly values or tenth of a pound for hourly values. Attach examples of calculations that illustrates the methodology used.

Air Pollutants (including regulated air pollutants and pollutants for which the source is major)	Emission Rates			CAS No.
	Actual Annual Emissions (tons/yr)	Potential to Emit		
		Hourly (lb/hr)	Annual (tons/yr)	
PM10	NA	2.6	0.6	
SOx	NA	11.9	2.6	
NOx	NA	89.4	19.3	
VOC	NA	2.7	0.6	
CO	NA	19.5	4.2	
HAP - Propylene	NA	--	0.015	115-07-1 (highest)
HAP - Benzene	NA	--	0.004	71-43-2 (2nd highest)
HAP - Toluene	--	--	0.0015	108-88-3 (3rd highest)

U.S. ENVIRONMENTAL PROTECTION AGENCY
APPLICATION FOR FEDERAL OPERATING PERMIT, 40 CFR PART 71

FORM EMISS - EMISSIONS CALCULATIONS

INSTRUCTIONS: Use this form to calculate potential to emit (PTE) for applicability purposes and actual emissions for fee purposes for each emissions unit, control device, or alternative operating scenario identified in section I of form **GIS**. If form **FEE** does not need to be submitted with the application, do not calculate actual emissions.

A. Emissions Unit ID FWP-001-004

B. Identification and Quantification of Emissions

Instructions: First, list each air pollutant that is either regulated at the unit or present in major amounts. Second, list any other regulated pollutant (for fee calculation) emitted at the unit that have not already been listed. Each HAP added to the list in this step may be simply listed as "HAP". Next, calculate PTE for applicability purposes and actual emissions for fee purposes for each listed air pollutant. Do not calculate PTE for air pollutants listed solely for fee purposes. Include all fugitives, including those that do not count towards applicability, when calculating actual emissions. At a minimum, round to the nearest tenth of a ton for yearly values or tenth of a pound for hourly values. Attach examples of calculations that illustrates the methodology used.

Air Pollutants (including regulated air pollutants and pollutants for which the source is major)	Emission Rates			CAS No.
	Actual Annual Emissions (tons/yr)	Potential to Emit Hourly (lb/hr)	Potential to Emit Annual (tons/yr)	
PM10	NA	4.4	0.4	
SOx	NA	6.5	0.6	
NOx	NA	61.7	5.4	
VOC	NA	4.9	0.4	
CO	NA	13.4	1.2	
HAP - Propylene	NA	--	0.003	115-07-1 (highest)
HAP - Formaldehyde	NA	--	0.001	50-00-0 (2nd highest)
HAP - Benzene	NA	--	0.001	71-43-2 (3rd highest)

U.S ENVIRONMENTAL PROTECTION AGENCY
APPLICATION FOR FEDERAL OPERATING PERMIT, 40 CFR PART 71

FORM EMISS - EMISSIONS CALCULATIONS

INSTRUCTIONS: Use this form to calculate potential to emit (PTE) for applicability purposes and actual emissions for fee purposes for each emissions unit, control device, or alternative operating scenario identified in section I of form **GIS**. If form **FEE** does not need to be submitted with the application, do not calculate actual emissions

A. Emissions Unit ID FLR-001

B. Identification and Quantification of Emissions

Instructions: First, list each air pollutant that is either regulated at the unit or present in major amounts. Second, list another regulated pollutant (for fee calculation) emitted at the unit that have not already been listed. Each HAP added to the list in this step may be simply listed as "HAP". Next, calculate PTE for applicability purposes and actual emissions for fee purposes for each listed air pollutant. Do not calculate PTE for air pollutants listed solely for fee purposes. Include all fugitives, including those that do not count towards applicability, when calculating actual emissions. At a minimum, round to the nearest tenth of a ton for yearly values or tenth of a pound for hourly values. Attach examples of calculations that illustrates the methodology used.

Air Pollutants (including regulated air pollutants and pollutants for which the source is major)	Emission Rates			CAS No.
	Actual Annual Emissions (tons/yr)	Potential to Emit Hourly (lb/hr)	Potential to Emit Annual (tons/yr)	
PM10	NA	--	--	
SOx	NA	Negligible	Negligible	
NOx	NA	14.9	0.1	
VOC	NA	12.6	0.1	
CO	NA	81.0	0.6	
HAP-Hexane	NA	--	1.7	110-54-3 (Highest)
HAP-Formaldehyde	NA	--	0.07	50-00-0 (2nd Highest)
HAP-Toluene	NA	--	0.003	108-08-3 (3rd Highest)

U.S. ENVIRONMENTAL PROTECTION AGENCY
APPLICATION FOR FEDERAL OPERATING PERMIT, 40 CFR PART 71

FORM EMISS - EMISSIONS CALCULATIONS

INSTRUCTIONS: Use this form to calculate potential to emit (PTE) for applicability purposes and actual emissions for fee purposes for each emissions unit, control device, or alternative operating scenario identified in section I of form GIS. If form FEE does not need to be submitted with the application, do not calculate actual emissions.

A. Emissions Unit ID FLR-002

B. Identification and Quantification of Emissions

Instructions: First, list each air pollutant that is either regulated at the unit or present in major amounts. Second, list any other regulated pollutant (for fee calculation) emitted at the unit that have not already been listed. Each HAP added to the list in this step may be simply listed as "HAP". Next, calculate PTE for applicability purposes and actual emissions for fee purposes for each listed air pollutant. Do not calculate PTE for air pollutants listed solely for fee purposes. Include all fugitives, including those that do not count towards applicability, when calculating actual emissions. At a minimum, round to the nearest tenth of a ton for yearly values or tenth of a pound for hourly values. Attach examples of calculations that illustrates the methodology used.

Air Pollutants (including regulated air pollutants and pollutants for which the source is major)	Emission Rates			CAS No
	Actual Annual Emissions (tons/yr)	Potential to Emit		
		Hourly (lb/hr)	Annual (tons/yr)	
PM10	NA	--	--	
SOx	NA	Negligible	Negligible	
NOx	NA	0.3	1.5	
VOC	NA	0.3	1.3	
CO	NA	1.9	8.1	
HAP-Hexane	NA	--	0.04	110-54-3 (highest)
HAP - Formaldehyde	NA	--	0.002	50-00-0 (2nd highest)
HAP - Toluene	NA	--	0.00007	108-88-3 (3rd highest)

U.S. ENVIRONMENTAL PROTECTION AGENCY
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FORM EMISS - EMISSIONS CALCULATIONS

INSTRUCTIONS. Use this form to calculate potential to emit (PTE) for applicability purposes and actual emissions for fee purposes for each emissions unit, control device, or alternative operating scenario identified in section I of form GIS. If form FEE does not need to be submitted with the application, do not calculate actual emissions

A. Emissions Unit ID FLR-003

B. Identification and Quantification of Emissions

Instructions: First, list each air pollutant that is either regulated at the unit or present in major amounts. Second, list any other regulated pollutant (for fee calculation) emitted at the unit that have not already been listed. Each HAP added to the list in this step may be simply listed as "HAP". Next, calculate PTE for applicability purposes and actual emissions for fee purposes for each listed air pollutant. Do not calculate PTE for air pollutants listed solely for fee purposes. Include all fugitives, including those that do not count towards applicability, when calculating actual emissions. At a minimum, round to the nearest tenth of a ton for yearly values or tenth of a pound for hourly values. Attach examples of calculations that illustrates the methodology used.

Air Pollutants (including regulated air pollutants and pollutants for which the source is major)	Emission Rates			CAS No.
	Actual Annual Emissions (tons/yr)	Potential to Emit Hourly (lb/hr)	Potential to Emit Annual (tons/yr)	
PM10	NA	--	--	
SOx	NA	Negligible	Negligible	
NOx	NA	0.07	0.3	
VOC	NA	0.06	0.2	
CO	NA	0.4	1.6	
HAP-Hexane	NA	--	0.007	110-54-3 (highest)
HAP - Formaldehyde	NA	--	0.0004	50-00-0 (2nd highest)
HAP - Toluene	NA	-	0.00001	108-88-3 (3rd highest)

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FORM EMISS - EMISSIONS CALCULATIONS

INSTRUCTIONS Use this form to calculate potential to emit (PTE) for applicability purposes and actual emissions for fee purposes for each emissions unit, control device, or alternative operating scenario identified in section I of form GIS If form FEE does not need to be submitted with the application, do not calculate actual emissions.

A Emissions Unit ID FUG-001

B Identification and Quantification of Emissions

Instructions: First, list each air pollutant that is either regulated at the unit or present in major amounts. Second, list any other regulated pollutant (for fee calculation) emitted at the unit that have not already been listed Each HAP added to the list in this step may be simply listed as "HAP". Next, calculate PTE for applicability purposes and actual emissions for fee purposes for each listed air pollutant. Do not calculate PTE for air pollutants listed solely for fee purposes. Include all fugitives, including those that do not count towards applicability, when calculating actual emissions At a minimum, round to the nearest tenth of a ton for yearly values or tenth of a pound for hourly values. Attach examples of calculations that illustrates the methodology used.

Air Pollutants (including regulated air pollutants and pollutants for which the source is major)	Emission Rates			CAS No
	Actual Annual Emissions (tons/yr)	Potential to Emit		
		Hourly (lb/hr)	Annual (tons/yr)	
VOC	NA	0.3	1.1	
HAP - Benzene	NA	--	0.4	71-43-2 (highest)
HAP - Toluene	NA	--	0.09	108-88-3 (2nd highest)
HAP - Xylenes	NA	--	0.012	1330-20-7 (3rd highest)

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FORM PTE - POTENTIAL TO EMIT SUMMARY

INSTRUCTIONS Complete this form once for the facility You may find it helpful to complete form **EMISS** for each emissions unit before completing this form For each emissions unit with emissions that count towards applicability, list the emissions unit ID and the PTE for the air pollutants listed below. If there are other air pollutants not listed below for which the source is a major source, provide attachments naming the air pollutant and showing calculation of the total for that pollutant Round values to the nearest tenth of a ton Add all values together in each column and enter the total in the space provided at the bottom of the table Also report these totals in section J of form **GIS**.

Emissions Unit ID	Regulated Air Pollutants and Pollutants for which the Source is Major						
	NOx (tons/yr)	VOC (tons/yr)	SO2 (tons/yr)	PM10 (tons/yr)	CO (tons/yr)	Lead (tons/yr)	HAP (tons/yr)
GEN-001-04	192.3	66.7	neg	13.0	233.5	—	2.02
ESG-001	19.3	0.6	2.6	0.6	4.2	—	0.024
FWP-001-004	5.4	0.4	0.6	0.4	1.2	—	0.008
FUG-001	—	1.14	—	—	—	—	0.02
FLR-001	0.11	0.09	neg	—	0.61	—	1.72
FLR-002	1.50	1.26	neg	neg	8.14	—	0.04
FLR-003	0.29	0.24	neg	neg	1.57	—	0.008
TOTALS	218.9	70.5	3.2	13.9	249.2	—	4.25

OMB Control No. 2060-0336

U.S. ENVIRONMENTAL PROTECTION AGENCY
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APPLICATION FORM EUD-1 - EMISSIONS UNIT DESCRIPTION FOR FUEL COMBUSTION SOURCES

INSTRUCTIONS: Complete this form for each significant emissions unit best described as a fuel combusting unit.

A. General Information

Emissions unit ID GEN-001-004 Description Solar Titan 130 Gas Turbine Generator, 4 units @ 15,209 HP per turbine

SIC Code (4-digit) 3511 SCC Code 2-01-002-01

B. Emissions Unit Description

Primary use Power generation for the GBS Temporary source ___ Yes X No

Manufacturer Solar Turbine Model No. Titan 130

Serial Number -- Installation date ___/___/ 2008 (estimated)

Boiler Type:

___ Industrial boiler ___ Process burner ___ Electric utility boiler

___ Other (describe) ___

Boiler horsepower rating ___ Boiler steam flow (lb/hr) ___

Type of Fuel-Burning Equipment (coal burning only):

___ Hand fired ___ Spreader stoker ___ Underfeed stoker ___ Overfeed stoker

___ Traveling grate ___ Shaking grate ___ Pulverized, wet bed ___ Pulverized, dry bed

Actual (average) Heat Input (each) 123.7 MM BTU/hr Maximum design heat input (each)123.7 MM BTU/hr

C. Fuel Data

Primary fuel type(s) Natural gas Standby fuel type(s) NA

Instructions: Describe each fuel expected to be used during the term of the permit.

Fuel Type	Max. Sulfur Content (%)	Max. Ash Content (%)	BTU Value (per cf, gal., or lb.)
Natural gas	Negligible	NA	1,053 per scf

D. Fuel Usage Rates

Instructions: For each fuel described above, enter actual and maximum fuel usage rates on a worst-case hourly and annual basis. Indicate the dimension for the fuel usage rate (e.g., gallons, cords, cubic feet).

Fuel Type	Annual Actual Usage	Maximum Usage	
		Hourly	Annual
Natural gas		469,896 scf (four turbines combined)	3,727,446,344 scf (four turbines combined)

E. Associated Air Pollution Control Equipment

Emissions unit ID NA Device type Dry low - NOx burners (SoLo NOx)

Air pollutant(s) Controlled CO, NOx Manufacturer Solar

Model No. _____ Serial No. NA

Installation date ____/____/____ Control efficiency (%) 25 ppm NOx, 50 ppm CO @ 15% O_2

Efficiency estimation method Vendor performance data

F. Ambient Impact Assessment

Instructions: This information must be completed by temporary sources or when ambient impact assessment is an applicable requirement for this emissions unit.

Parameters to be determined

Stack height (ft) _____ Inside stack diameter (ft) _____

Stack temp(°F) 947° F Design stack flow rate (ACFM) _____

Actual stack flow rate (ACFM) 210,564 Velocity (ft/sec) _____

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APPLICATION FORM EUD-1 - EMISSIONS UNIT DESCRIPTION FOR FUEL COMBUSTION SOURCES

INSTRUCTIONS: Complete this form for each significant emissions unit best described as a fuel combusting unit.

A. General Information

Emissions unit ID ESG-001 Description Essential Services Diesel Generator (Caterpillar 3612) - 3,688 HP

SIC Code (4-digit) 3519 SCC Code 2-01-001-02

B. Emissions Unit Description

Primary use Backup power generator for the GBS Temporary source ___ Yes X No

Manufacturer Caterpillar Model No. Titan 3612

Serial Number To be determined Installation date ___/___/ 2008 (estimated)

Boiler Type:

___ Industrial boiler ___ Process burner ___ Electric utility boiler

___ Other (describe) _____

Boiler horsepower rating _____ Boiler steam flow (lb/hr) _____

Type of Fuel-Burning Equipment (coal burning only):

___ Hand fired ___ Spreader stoker ___ Underfeed stoker ___ Overfeed stoker

___ Traveling grate ___ Shaking grate ___ Pulverized, wet bed ___ Pulverized, dry bed

Actual (average) Heat Input _____ MM BTU/hr Maximum design heat input 24.23 MM BTU/hr

C. Fuel Data

Primary fuel type(s) Diesel Standby fuel type(s) NA

Instructions: Describe each fuel expected to be used during the term of the permit.

Fuel Type	Max. Sulfur Content (%)	Max. Ash Content (%)	BTU Value (per cf, gal., or lb.)
Diesel	0.4	ND	19,300 per lb

D. Fuel Usage Rates

Instructions: For each fuel described above, enter actual and maximum fuel usage rates on a worst-case hourly and annual basis. Indicate the dimension for the fuel usage rate (e.g., gallons, cords, cubic feet).

Fuel Type	Annual Actual Usage	Maximum Usage	
		Hourly	Annual
Diesel		178.1 gal	76,952 gal (5% use factor)

E. Associated Air Pollution Control Equipment

Emissions unit ID NA Device type NA

Air pollutant(s) Controlled NA Manufacurer NA

Model No. NA Serial No. NA

Installation date ____/____/____ Control efficiency (%) NA

Efficiency estimation method _____

F. Ambient Impact Assessment

Instructions: This information must be completed by temporary sources or when ambient impact assessment is an applicable requirement for this emissions unit.

Parameters to be determined

Stack height (ft) _____ Inside stack diameter (ft) _____

Stack temp(°F) _____ Design stack flow rate (ACFM) _____

Actual stack flow rate (ACFM) _____ Velocity (ft/sec) _____

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APPLICATION FORM EUD-1 - EMISSIONS UNIT DESCRIPTION FOR FUEL COMBUSTION SOURCES

INSTRUCTIONS: Complete this form for each significant emissions unit best described as a fuel combusting unit.

A. General Information

Emissions unit ID FWP-001-004 Description Fire water pump, Diesel engine, 4 units @ - 500 HP each

SIC Code (4-digit) 3519 SCC Code _____

B. Emissions Unit Description

Primary use Fire fighting needs Temporary source ___ Yes X No

Manufacturer Caterpillar Model No. 3406

Serial Number To be determined Installation date ___/___/ 2008 (estimated)

Boiler Type:

___ Industrial boiler ___ Process burner ___ Electric utility boiler

___ Other (describe) _____

Boiler horsepower rating _____ Boiler steam flow (lb/hr) _____

Type of Fuel-Burning Equipment (coal burning only):

___ Hand fired ___ Spreader stoker ___ Underfeed stoker ___ Overfeed stoker

___ Traveling grate ___ Shaking grate ___ Pulverized, wet bed ___ Pulverized, dry bed

Actual (average) Heat Input _____ MM BTU/hr Maximum design heat input 3.3 MM BTU/hr

C. Fuel Data

Primary fuel type(s) Diesel Standby fuel type(s) NA

Instructions: Describe each fuel expected to be used during the term of the permit.

Fuel Type	Max. Sulfur Content (%)	Max. Ash Content (%)	BTU Value (per cf, gal., or lb.)
Diesel	0.4	ND	19,300 per lb

D. Fuel Usage Rates

Instructions: For each fuel described above, enter actual and maximum fuel usage rates on a worst-case hourly and annual basis. Indicate the dimension for the fuel usage rate (e.g., gallons, cords, cubic feet).

Fuel Type	Annual Actual Usage	Maximum Usage	
		Hourly	Annual
Diesel		96.6 gal (four engines)	16,905 gal (four engines)

E. Associated Air Pollution Control Equipment

Emissions unit ID NA Device type NA

Air pollutant(s) Controlled NA Manufacurer NA

Model No. NA Serial No. NA

Installation date ___/___/___ Control efficiency (%) NA

Efficiency estimation method NA

F. Ambient Impact Assessment

Instructions: This information must be completed by temporary sources or when ambient impact assessment is an applicable requirement for this emissions unit.

Parameters to be determined

Stack height (ft) _____.____ Inside stack diameter (ft) _____.____

Stack temp(°F) _____.____ Design stack flow rate (ACFM) _____.____

Actual stack flow rate (ACFM) _____.____ Velocity (ft/sec) _____.____

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APPLICATION FORM EUD-1 - EMISSIONS UNIT DESCRIPTION FOR FUEL COMBUSTION SOURCES

INSTRUCTIONS: Complete this form for each significant emissions unit best described as a fuel combusting unit.

A. General Information

Emissions unit ID FLR-001 Description HP Flare

SIC Code (4-digit) 4491 SCC Code 3-06-009-03

B. Emissions Unit Description

Primary use Emergency flaring Temporary source ___ Yes X No

Manufacturer Caterpillar Model No. 3406

Serial Number _____ Installation date ____/____/ 2008 (estimated)

Boiler Type: NA

___ Industrial boiler ___ Process burner ___ Electric utility boiler

___ Other (describe) _____

Boiler horsepower rating NA Boiler steam flow (lb/hr) NA

Type of Fuel-Burning Equipment (coal burning only): NA

___ Hand fired ___ Spreader stoker ___ Underfeed stoker ___ Overfeed stoker

___ Traveling grate ___ Shaking grate ___ Pulverized, wet bed ___ Pulverized, dry bed

Actual (average) Heat Input 0.208 MM BTU/hr Maximum design heat input 8,000 MM BTU/hr

C. Fuel Data

Primary fuel type(s) Natural Gas Standby fuel type(s) NA

Instructions: Describe each fuel expected to be used during the term of the permit.

Fuel Type	Max. Sulfur Content (%)	Max. Ash Content (%)	BTU Value (per cf, gal., or lb.)
Natural Gas	Neg	NA	1,053 per scf

D. Fuel Usage Rates

Instructions: For each fuel described above, enter actual and maximum fuel usage rates on a worst-case hourly and annual basis. Indicate the dimension for the fuel usage rate (e.g., gallons, cords, cubic feet).

Fuel Type	Annual Actual Usage	Maximum Usage	
		Hourly	Annual
Natural gas	--	208,333 scf/hr	3,123,379 scf/yr

E. Associated Air Pollution Control Equipment

Emissions unit ID NA Device type NA

Air pollutant(s) Controlled NA Manufacurer NA

Model No. NA Serial No. NA

Installation date ___/___/___ Control efficiency (%) NA

Efficiency estimation method NA

F. Ambient Impact Assessment

Instructions: This information must be completed by temporary sources or when ambient impact assessment is an applicable requirement for this emissions unit.

Parameters to be determined

Stack height (ft) _____.____ Inside stack diameter (ft) _____.____

Stack temp(°F) _____.____ Design stack flow rate (ACFM) _____.____

Actual stack flow rate (ACFM) _____.____ Velocity (ft/sec) _____.____

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APPLICATION FORM EUD-1 - EMISSIONS UNIT DESCRIPTION FOR FUEL COMBUSTION SOURCES

INSTRUCTIONS: Complete this form for each significant emissions unit best described as a fuel combusting unit.

A. General Information

Emissions unit ID FLR-002 Description LP Flare

SIC Code (4-digit) 4491 SCC Code 3-06-009-03

B. Emissions Unit Description

Primary use Periodic flaring of boil off gas Temporary source ___ Yes X No

Manufacturer _____ Model No. _____

Serial Number _____ Installation date ___/___/ 2008 (estimated)

Boiler Type:

___ Industrial boiler ___ Process burner ___ Electric utility boiler

___ Other (describe) _____

Boiler horsepower rating NA Boiler steam flow (lb/hr) NA

Type of Fuel-Burning Equipment (coal burning only): NA

___ Hand fired ___ Spreader stoker ___ Underfeed stoker ___ Overfeed stoker

___ Traveling grate ___ Shaking grate ___ Pulverized, wet bed ___ Pulverized, dry bed

Actual (average) Heat Input _____ MM BTU/hr Maximum design heat input 1,603 MM BTU/hr

C. Fuel Data

Primary fuel type(s) Natural gas Standby fuel type(s) NA

Instructions: Describe each fuel expected to be used during the term of the permit.

Fuel Type	Max. Sulfur Content (%)	Max. Ash Content (%)	BTU Value (per cf, gal., or lb.)
Natural gas	Neg	NA	1,053

D. Fuel Usage Rates

Instructions: For each fuel described above, enter actual and maximum fuel usage rates on a worst-case hourly and annual basis. Indicate the dimension for the fuel usage rate (e.g., gallons, cords, cubic feet).

Fuel Type	Annual Actual Usage	Maximum Usage	
		Hourly	Annual
Natural gas		4,783 scf	41,900,000 scf

E. Associated Air Pollution Control Equipment

Emissions unit ID NA Device type NA

Air pollutant(s) Controlled NA Manufacurer NA

Model No. NA Serial No. NA

Installation date ___/___/___ Control efficiency (%) NA

Efficiency estimation method NA

F. Ambient Impact Assessment

Instructions: This information must be completed by temporary sources or when ambient impact assessment is an applicable requirement for this emissions unit.

Parameters to be determined

Stack height (ft) _____.____ Inside stack diameter (ft) _____.____

Stack temp(°F) _____.____ Design stack flow rate (ACFM) _____.____

Actual stack flow rate (ACFM) _____.____ Velocity (ft/sec) _____.____

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APPLICATION FORM EUD-1 - EMISSIONS UNIT DESCRIPTION FOR FUEL COMBUSTION SOURCES

INSTRUCTIONS: Complete this form for each significant emissions unit best described as a fuel combusting unit.

A. General Information

Emissions unit ID FLR-003 Description Flare pilots on HP and LP Flares combined

SIC Code (4-digit) 4491 SCC Code 3-06-009-03

B. Emissions Unit Description

Primary use Pilots to maintain flares for emergency operation Temporary source ___ Yes X No

Manufacturer _____ Model No. _____

Serial Number _____ Installation date ___/___/ 2008 (estimated)

Boiler Type: NA

___ Industrial boiler ___ Process burner ___ Electric utility boiler

___ Other (describe) _____

Boiler horsepower rating NA Boiler steam flow (lb/hr) NA

Type of Fuel-Burning Equipment (coal burning only): NA

___ Hand fired ___ Spreader stoker ___ Underfeed stoker ___ Overfeed stoker

___ Traveling grate ___ Shaking grate ___ Pulverized, wet bed ___ Pulverized, dry bed

Actual (average) Heat Input 0.632 MM BTU/hr Maximum design heat input 0.632 MM BTU/hr

C. Fuel Data

Primary fuel type(s) Natural gas Standby fuel type(s) NA

Instructions: Describe each fuel expected to be used during the term of the permit.

Fuel Type	Max. Sulfur Content (%)	Max. Ash Content (%)	BTU Value (per cf, gal., or lb.)
Natural gas	Neg	NA	1,053

D. Fuel Usage Rates

Instructions: For each fuel described above, enter actual and maximum fuel usage rates on a worst-case hourly and annual basis. Indicate the dimension for the fuel usage rate (e.g., gallons, cords, cubic feet).

Fuel Type	Annual Actual Usage	Maximum Usage	
		Hourly	Annual
Natural gas (HP & LP Flares combined)	8,103,000 scf	925 scf (All pilots combined)	8,103,000 scf

E. Associated Air Pollution Control Equipment

Emissions unit ID NA Device type NA

Air pollutant(s) Controlled NA Manufacurer NA

Model No. NA Serial No. NA

Installation date ___/___/___ Control efficiency (%) NA

Efficiency estimation method NA

F. Ambient Impact Assessment

Instructions: This information must be completed by temporary sources or when ambient impact assessment is an applicable requirement for this emissions unit. Parameters to be determined

Stack height (ft) _____ Inside stack diameter (ft) _____

Stack temp(°F) _____ Design stack flow rate (ACFM) _____

Actual stack flow rate (ACFM) _____ Velocity (ft/sec) _____

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APPLICATION FORM EUD-2 - EMISSIONS UNIT DESCRIPTION FOR VOC EMITTING SOURCES

INSTRUCTIONS: Complete this form for each significant emissions unit best described as a VOC emitting unit.

A. General Information

Emissions unit ID FUG-001 Description Fugitive Emissions

SIC Code (4-digit) 4491 SCC Code _____

B. Emissions Unit Description

Equipment type Fugitive Emissions Temporary source: ___ Yes X No

Manufacturer NA Model No. NA

Serial No. NA Installation date ___/___/2008 (estimated)

Articles being coated or degreased NA

Application method NA

Overspray (surface coating) (%) NA Drying method NA

No. of dryers NA Tank capacity (degreasers) (gal) NA

C. Associated Air Pollution Control Equipment

Emissions unit ID NA Device Type NA

Manufacturer NA Model No. NA

Serial No. NA Installation date ___/___/___

Control efficiency (%) NA Capture efficiency (%) NA

Air pollutant(s) controlled NA Efficiency estimation method NA

D. Ambient Impact Assessment

Instructions: This information must be completed by temporary sources or when ambient impact assessment is an applicable requirement for this emissions unit.

Stack height (ft) NA Inside stack diameter (ft) NA

Stack temp(°F) NA Design stack flow rate (ACFM) NA

Actual stack flow rate (ACFM) NA Velocity (ft/sec) NA

E. VOC-containing Substance Data

Instructions: List each VOC-containing substance consumed, processed or produced at the emissions unit that is emitted into the atmosphere. In the name column, if providing a brand name of a substance, include the name of the manufacture; if the substance contains HAP, list the constituent HAP.

VOC-Containing Substance Name (Generic, Chemical or Brand Name)	CAS No. (if available)	Substance Type (e.g., coating, solvent, ink, etc.)	Actual Usage (gal/yr)	Maximum Usage		VOC Content (lb/gal)
				gal/day	gal/year	
Natural Gas Fugitives		Natural Gas	NA	NA	NA	NA

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FORM FEE - FEE CALCULATION WORKSHEET

No Fees - Sources not yet operational

INSTRUCTIONS: Use this form to initially or thereafter on a annual basis report actual emissions and calculate fees, consistent with § 71.9

A. General Information

Instructions: All sources must complete this section

Type of fee calculation worksheet (Check one)

___ Initial ___ Annual

Deadline for submitting fee calculation worksheet ____/____/_____

For initial fee calculation worksheets, emissions are based on (Check one)

___ Actual emissions for the preceding year

___ Estimates of actual emissions for the preceding year

___ Estimates of actual emissions for the current year

If you checked the last box, provide the date the facility commenced operations ____/____/_____

B. Source Information

Instructions: Complete this section only if you are not applying for a permit at this time.

Source or facility name _____

Mailing address: Street or P O Box _____

City _____ State _____ ZIP _____ - _____

Contact person _____ Title _____

Telephone (_____) _____ - _____ Ext _____ Part 71 permit no. _____

C. Certification of Truth, Accuracy and Completeness

Instructions: This form must be signed by the responsible official

I certify under penalty of law that, based on information and belief formed after reasonable inquiry, the statements and information contained in this fee calculation worksheet (and attachments) are true, accurate and complete

Name (signed) _____

Name (typed) _____ Date: ____/____/____

D. Annual Emissions Report for Fee Calculation Purposes -- Non-HAP

Instructions: Report calendar-year actual emissions of regulated pollutants (for fee calculation) except for HAP, and use for both initial and annual fee calculation purposes. Section E is used to report actual emissions of HAP. Quantify all actual emissions, including fugitives, but do not include insignificant emissions. Round to the nearest tenth of a ton. Sum the emissions in each column and enter a subtotal at the bottom of the page. If a subtotal is greater than 4,000 tons, enter 4,000. Submit attachments showing calculations.

This data is for _____ (year)

Emissions Unit ID	Actual Emissions (Tons/Year)					
	NOx	VOC	SO2	PM10	Lead	Other
SUBTOTALS						

E. Annual Emissions Report for Fee Calculation Purposes -- HAP

Instructions: Use the first table below to identify each HAP meeting the definition of regulated pollutant (for fee calculation) emitted at the facility, identify the CAS number, and assign a unique identifier for use in the second table in this section. When assigning identifier codes, please use "HAP1" for the first, "HAP2" for the second, and so on.

Name of HAP	CAS No.	Identifier
		HAP ___
		HAP ___
		HAP ___
		HAP ___
		HAP ___
		HAP ___
		HAP ___
		HAP ___

Instructions: Now report the actual emissions of each individual HAP identified above. Use the identifiers assigned in the table above to identify each HAP. Include all emissions, including fugitives, but do not include insignificant emissions. Report emissions values to the nearest tenth of a ton. Sum the emissions in each column and show a subtotal at the bottom of the page. If a subtotal is greater than 4,000 tons, enter 4,000. Submit attachments showing calculations.

This data is for _____ (year)

Emissions Unit ID	Actual Emissions (Tons/Year)							
	HAP___	HAP___	HAP___	HAP___	HAP___	HAP___	HAP___	HAP___
SUBTOTALS								

F. Fee Calculation Worksheet

Instructions: This section is used to calculate the total fee owed for initial application or annual fee payment purposes. Unless otherwise instructed to proceed to a different line, always proceed to the next line. If you do not need to reconcile estimated against actual emissions, complete the part for emissions calculation (lines 1 - 5) and then proceed to the part for fee calculation (lines 21 - 26). A final permit or permit revision will not be issued until all fees, interest, and penalties assessed against a source are paid. In addition, the initial application for a source will not be found complete unless the source pays all fees owed.

EMISSIONS CALCULATION

1. Sum the subtotals from section D of this form and enter the result on this line _____

2. Sum the subtotals from section E of this form and enter the result on this line _____

3. Total lines 1 and 2 and enter the result on this line _____

4. Sources are not required to pay fees twice for the same emissions [see § 71.9(c)(5)(ii)]. Enter the amount of emissions that were counted twice. Attach supplementary information identifying the emissions units where double counting has occurred and explain why double counting has occurred. If there has been no double counting enter "0." _____

5. Subtract the amount on line 4 from the amount on line 3, round to the nearest ton, and enter the result on this line. _____

RECONCILIATION OF ESTIMATED EMISSIONS AGAINST ACTUAL EMISSIONS (WHEN INITIAL ESTIMATES WERE BASED ON THE CURRENT CALENDAR YEAR)

Only complete lines 6 - 10 if you are now preparing the first annual fee worksheet and the initial fee worksheet included estimated emissions for the current calendar year. See §§ 71.9(e)(2) and 71.9(h)(3). Otherwise skip this part of the form and proceed to the next part of the form (starting at line 11) or to the fee calculation part of the form (starting at line 21).

6. Enter the total estimated emissions previously reported on line 5 of the initial fee calculation worksheet. These are estimated emissions for the year that the initial fee worksheet was submitted. _____

7. If the amount on line 5 of this form is greater than the amount on line 6, subtract line 6 from line 5, and enter the result on this line. Otherwise enter "0." _____

8. If the amount on line 6 is greater than the amount on line 5, subtract line 5 from line 6, and enter the result on this line. Otherwise enter "0." _____

9. Multiply the amount on line 7 by (last year's $/ton amount[1]), and enter the result on this line. This is the amount of underpayment. Go to line 21. $_____

10. Multiply the amount on line 8 by (last year's $/ton amount), and enter the result on this line. This is the amount of overpayment. Go to line 21. $_____

[1] $/ton amounts to be determined at the time of program implementation, see § 71.9(c)(1) - (3).

RECONCILIATION OF ESTIMATED EMISSIONS AGAINST ACTUAL EMISSIONS (WHEN INITIAL ESTIMATES WERE BASED ON THE PRECEDING CALENDAR YEAR)

Only complete lines 11 - 20 if you are now preparing the first annual fee worksheet and the initial fee worksheet included estimated emissions for the preceding calendar year. See §§ 71.9(f)(2) and 71.9(h)(3). If you must complete this part of the form, you must also submit annual emission reports (sections D and E) for the year preceding initial worksheet submittal. Otherwise skip this part of the form and proceed to the fee calculation part of the form (lines 21 through 26).

11. Sum the subtotals from section D for the calendar year preceding initial fee worksheet submittal and enter the result on this line. _____

12. Sum the subtotals from section E for the calendar year preceding initial fee worksheet submittal and enter the result on this line _____

13. Total lines 11 and 12 and enter the result on this line. This is the total actual emissions for the calendar year preceding initial fee worksheet submittal _____

RECONCILIATION OF ESTIMATED EMISSIONS AGAINST ACTUAL EMISSIONS
(WHEN INITIAL ESTIMATES WERE BASED ON THE PRECEDING CALENDAR YEAR)
-- CONTINUED --

14.	Sources are not required to pay fees twice for the same emissions [see § 71.9(c)(5)(ii)]. Enter the amount of emissions (actual emissions for the year preceding initial worksheet submittal) that were counted twice. Attach supplementary information identifying the emissions units where double counting has occurred and explain why double counting has occurred. If there has been no double counting enter "0."	_____
15.	Subtract the amount on line 14 from the amount on line 13, round to the nearest ton, and enter the result on this line.	_____
16.	Enter the total estimated emissions previously reported on line 5 of the initial fee calculation worksheet. These are estimated emissions for the calendar year preceding initial fee worksheet submittal.	_____
17.	If the amount on line 15 is greater than the amount on line 16, subtract line 16 from line 15, and enter the result on this line. Otherwise enter "0."	_____
18.	If the amount on line 16 is greater than the amount on line 15, subtract line 15 from line 16, and enter the result on this line. Otherwise enter "0."	_____
19.	Multiply the amount on line 17 by (last year's $/ton amount[1]) and enter the result on this line. This is the amount of underpayment.	$_____
20.	Multiply the amount on line 18 by (last year's $/ton amount) and enter the result on this line. This is the amount of overpayment.	$_____

FEE CALCULATION

21.	Multiply the amount on line 5 on this form by (this year's $/ton amount) and enter the result on this line.	$_____
22.	If you have reconciled estimated against actual emissions, enter the underpayment from line 9 or 19 on this line. Otherwise enter "0."	$_____
23.	If you have reconciled estimated against actual emissions, enter the overpayment from line 10 or 20 on this line. Otherwise enter "0."	$_____
24.	If the amount on line 22 is greater than "0," add this amount to the amount on line 21 and enter the result on this line. If the amount on line 23 is greater than "0," subtract this amount from the amount on line 21 and enter the result on this line. Otherwise enter the amount on line 21 on this line. This is the fee adjusted for reconciliation.	$_____
25.	If your account was credited for fee assessment error [see § 71.9(j)] since the last time you submitted a fee calculation worksheet, enter the amount of the credit on this line. Otherwise enter "0."	$_____
26.	Subtract the amount on line 25 from the amount on line 24 and enter the result on this line. Stop here. This is the total fee amount that you must remit to EPA.	$_____

PENALTIES AND INTEREST

Payment received later than the due date shall be assessed interest and, in certain cases, penalty charges. If payment is late, do not calculate penalties and interest at this time. The permitting authority will assess these and mail you an invoice.

OMB Control No. 2060-0336

U.S. ENVIRONMENTAL PROTECTION AGENCY
APPLICATION FOR FEDERAL OPERATING PERMIT, 40 CFR PART 71

APPLICATION FORM FF - FEE FILING

Instructions: Complete this form once for the part 71 source (facility) and send it to the appropriate lockbox bank address, along with full payment. This form required at time of initial, and thereafter, annual fee payment.

A. Source or Facility Name _____

B. Mailing Address and Contact Person:

Street or P.O. Box _____

City _____ State _____ ZIP _____ - _____

Contact Person: _____ Title _____

Telephone (_____) _____ - _____ Ext _____

C. Total Fee Payment Remitted: $ _____

U.S. ENVIRONMENTAL PROTECTION AGENCY
APPLICATION FOR FEDERAL OPERATING PERMIT, 40 CFR PART 71

FORM 1-COMP - INITIAL COMPLIANCE PLAN & COMPLIANCE CERTIFICATION

INSTRUCTIONS: There are 3 pages to this form. On this page, complete Sections A, B, and C for each applicable requirement. If different portions of an applicable requirement or compliance methods vary from unit to unit, prepare a separate form for each unique set of requirements, methods, and units. For compliance plan purposes, assume permit issuance will occur by March 22, 2001, unless you are not required to submit an application until after March 22, 2000, in which case assume issuance will occur no later than 18 months after submittal.

A. COMPLIANCE STATUS OF EACH APPLICABLE REQUIREMENT (Describe each applicable requirement and determine its compliance status)

Cite and Describe the Applicable Requirement	Unit ID(s):	Compliance status at time of application :
NSPS 40 CFR 60 Subpart GG, 40 CFR 60.332(a)(2)-shall not discharge any gases containing NO_x in excess of STD=[(0.0150)(14.4)/(y)] +F	GEN-001 GEN-002 GEN-003 GEN-004	_X_ In Compliance ___ Not In Compliance

B. METHODS USED TO DETERMINE COMPLIANCE (Describe all methods you used to determine compliance with this requirement)

1) Monitor nitrogen content of fuel being fired in the turbine by documentation of records of fuel composition received from each LNG carrier during unloading and upon receipt of LNG.
2) Compute Nitrogen Oxides emission rate utilizing equation 40 CFR 60.335 (c) (1).
3) Conduct initial testing of NO_x and O_2 and any subsequent testing under requirements of 40 CFR Part 60, Appendix A, Method 20, at loading specified under 40 CFR Part 60.335 (c) (3).
4) Annual compliance certification.

C. COMPLIANCE PLAN STATEMENTS (Respond to one of these statements for this applicable requirement)

1. If in compliance at this time, I will continue to comply.	2. If not in compliance at this time, I will be in compliance by expected date of permit issuance.	3. For future-effective requirements, I will meet this requirement on a timely basis.
_X_ Yes ___ No	___ Yes ___ No Expected Date ___/___/___	___ Yes ___ No

A. COMPLIANCE STATUS OF EACH APPLICABLE REQUIREMENT (Describe each applicable requirement and determine its compliance status)

Cite and Describe the Applicable Requirement	Unit ID(s)	Compliance status at time of application :
NSPS - 40 CFR Part 60 Subpart GG - 40 CFR 60.333(b) Standards for Sulfur Dioxide: shall not burn any fuel which contains sulfur in excess of 0.8 percent by weight.	GEN - 001 GEN - 002 GEN - 003 GEN - 004	_X_ In Compliance ___ Not In Compliance

B. METHODS USED TO DETERMINE COMPLIANCE (Describe all methods you used to determine compliance with the requirement)

1) Monitor content of sulfur in fuel being fired in turbine by documentation of records of fuel composition received from each LNG carrier during unloading and upon receipt of LNG.
2) Determine compliance as indicated in 40 CFR 60.335(c).
3) Annual compliance certification.

C. COMPLIANCE PLAN STATEMENTS (Respond to one of these statements for this applicable requirement)

1. If in compliance at this time, I will continue to comply.	2. If not in compliance at this time, I will be in compliance by expected date of permit issuance.	3. For future-effective requirements, I will meet this requirement on a timely basis.
_X_ Yes ___ No	___ Yes ___ No Expected Date ___/___/___	___ Yes ___ No

OMB Control No. 2060-0336

U.S. ENVIRONMENTAL PROTECTION AGENCY
APPLICATION FOR FEDERAL OPERATING PERMIT, 40 CFR PART 71

FORM I-COMP - INITIAL COMPLIANCE PLAN & COMPLIANCE CERTIFICATION

INSTRUCTIONS: There are 3 pages to this form. On this page, complete Sections A, B, and C for each applicable requirement. If different portions of an applicable requirement or compliance methods vary from unit to unit, prepare a separate form for each unique set of requirements, methods, and units. For compliance plan purposes, assume permit issuance will occur by March 22, 2001, unless you are not required to submit an application until after March 22, 2000, in which case assume issuance will occur no later than 18 months after submittal

A. COMPLIANCE STATUS OF EACH APPLICABLE REQUIREMENT (Describe each applicable requirement and determine its compliance status)

Cite and Describe the Applicable Requirement	Unit ID(s):	Compliance status at time of application :
Louisiana SIP Chapter 11 and 13 opacity standard of 20%	All units listed on Form GIS Section I	_X_ In Compliance ___ Not In Compliance

B. METHODS USED TO DETERMINE COMPLIANCE (Describe all methods you used to determine compliance with this requirement)

Turbine generators will always be fired with natural gas.

C. COMPLIANCE PLAN STATEMENTS (Respond to one of these statements for this applicable requirement)

1. If in compliance at this time, I will continue to comply	2. If not in compliance at this time, I will be in compliance by expected date of permit issuance.	3. For future-effective requirements, I will meet this requirement on a timely basis.
_X_ Yes ____ No	___ Yes ___ No Expected Date ____/____/____	___ Yes ____ No

A. COMPLIANCE STATUS OF EACH APPLICABLE REQUIREMENT (Describe each applicable requirement and determine its compliance status)

Cite and Describe the Applicable Requirement	Unit ID(s):	Compliance status at time of application :
		___ In Compliance ___ Not In Compliance

B. METHODS USED TO DETERMINE COMPLIANCE (Describe all methods you used to determine compliance with the requirement)

C. COMPLIANCE PLAN STATEMENTS (Respond to one of these statements for this applicable requirement)

1. If in compliance at this time, I will continue to comply.	2. If not in compliance at this time, I will be in compliance by expected date of permit issuance.	3. For future-effective requirements, I will meet this requirement on a timely basis.
___ Yes ____ No	___ Yes ___ No Expected Date ____/____/____	___ Yes ____ No

U S ENVIRONMENTAL PROTECTION AGENCY
APPLICATION FOR FEDERAL OPERATING PERMIT, 40 CFR PART 71

APPLICATION FORM CTAC - CERTIFICATION OF TRUTH, ACCURACY, AND COMPLETENESS BY RESPONSIBLE OFFICIAL

INSTRUCTIONS One copy of this form must be completed, signed, and sent with each submission of documents (i.e., application forms, including any updates to applications), and for every document required by a part 71 permit (e.g., annual compliance certification, 6-month monitoring reports, progress reports, and notices required by the terms of a part 71 permit).

Responsible Official. Identify the responsible official and provide contact information.

Name (Last) Delaney (First) R. (Middle) P.

Title Vice President

Street or Post Office Box 17001 Northchase

City Houston State Tx ZIP 77060

Telephone ( ) - Ext Facsimile (281) 654-4266

Certification of Truth, Accuracy and Completeness. The Responsible Official must sign this statement.

I certify under penalty of law that, based on information and belief formed after reasonable inquiry, the statements and information contained in these documents are true, accurate and complete.

Name (signed) R.P. Delaney

Name (printed or typed) R.P. Delaney Date May 6, 2004

APPENDIX B

EMISSION CALCULATIONS

Table B.1 Summary of Equipment Emission Factors and Fuel Usage Conversion Factors for Fixed Sources as Applied in the Calculations.

Fuel Usage Conversion Factors	Natural Gas Turbines		Natural Gas Engines		Diesel Recip. Engine		Reference	Date
	SCF/hp-hr	9.524	SCF/hp-hr	7.143	GAL/hp-hr	0.0483	AP42 3.2-1	4/76 & 8/84

Equipment/Emission Factors	Units	PM	SOx [1]	NOx	VOC	CO	Reference	Date
SOLAR Titan 130	lbm/MMBtu (Fuel LHV)	0.0066	0	0.098	0.034	0.119	SOLAR Performance Data (NOx, CO, UHC); AP-42 3.1-2	Dec-04
Diesel Recip > 600 hp	gms/hp-hr	1	1.468	14	1.12	3.03	AP42 3.3-1	Oct-96
Diesel Recip < 600 hp	gms/hp-hr	0.32	1.468	11	0.33	2.4	AP42 3.4-1	Oct-96
NG Flares	lbs/mmscf		0	71.4	147	388.5	AP42 13.5-1	Sep-91
Tank Vapors	lbs/bbl				0.03		E&P Forum	Jan-93

Sulfur Content Source	Value	Units
Diesel Fuel	0.4	% weight

[1] Negligible sulfur content in the natural gas (per ExxonMobil engineers). SO2 emission factor for diesel engines < 600hp assumed the same as the the factor for larger engines since the sulpfur content is accounted for in the emission factor calculation

Fugitive Gas Emissions
Using Distribution of equipment for Vista del Sol LNG Regassification Plant

Source	Stream Composition	No. of components for LNG (NG)*	No. of components for Diesel*	Control Method	Control Effeciency	SOCMI Emission Factors from EPA-453/R-95-017 Table 2-1**		Refinery Average Emission Factors from EPA-453/R-95-017 Table 2-2**		VOC Emissions After Control (NG, LNG and diesel)		To be used in Emissions Estimates for Pearl Seaport Offshore Regas Facility
					(%)	lb TOC/hr/source	kg TOC/hr/source	lb NMHC/hr/source	kg NMHC/hr/source	lb/hr	Tons/yr	
Valves	Gas/Vapor	733	0	-	0	0.013161581	0.00597	0.059083816	0.0268	0.001871603	0.008197622	
	Light Liquid	488		-	0	0.008884619	0.00403	0.024030358	0.0109	0.000841125	0.003684126	
	Heavy Liquid		60	-	0	0.000507063	0.00023	0.000507063	0.00023	0.030423756	0.133256051	
Pumps	Light Liquid	10		A	0	0.043871938	0.0199	0.25132668	0.114	8.51116E-05	0.000372789	
	Heavy Liquid	0	2	-	0	0.019003824	0.00862	0.04629702	0.021	0.09259404	0.405561895	
Compressors	Gas/Vapor	4		-	0	0.50265336	0.228	1.40213832	0.636	0.000390059	0.001708458	
Relief Valves	Gas/Vapor	56	0	D	0	0.22928048	0.104	0.3527392	0.16	0.002490903	0.010910156	
Flanges/Connectors	Gas/Vapor	223		-	0	0.004034455	0.00183	0.000051155	0.00025	0.000174539	0.000764479	
	Light Liquid	232		-	0	0.004034455	0.00183	0.000051155	0.00025	0.000181583	0.000795332	
	Heavy Liquid	0	55	-	0	0		0		0	0	
Open-Ended Lines	All	305	25	B	100	0.003747854	0.0017	0.005070626	0.0023	0	0	
Sampling Connections	All	4	0	C	100	0.0330693	0.015	0.0330693	0.015	0	0	
Total:										0.13	0.57	Vista del Sol
2 x the Total:										0.26	1.13	Pearl Deepwater Port Regas

0.019% *** VOC in LNG/NG from gas speciation provided for Vista del Sol

Notes:
* Vista Del Sol Component Counts Estimate of piping and equipment components from P&ID ICR issue (15Mar04)
** Factors are taken from USEPA document for emissions estimation, EPA-453/R-95-017, Nov 1995, Page 2-12,13.
*** Speciation for LNG is assumed to be rich gas, which has a higher VOC content than lean gas

Table B.2 Detailed Emissions Calculations for Fixed Sources at the LNG Terminal.

COMPANY	AREA		BLOCK
LNG Receiving Terminal	West Cameron		229

OPERATIONS	EQUIPMENT		UNIT RATING	UNIT MAX. FUEL	UNIT ACT. FUEL	RUN TIME			MAXIMUM POTENTIAL POUNDS PER HOUR					ESTIMATED ACTUAL TONS/YR				
	Diesel Engines		HP	GAL/HR	GAL/D													
	Nat. Gas Engines		MMBTU/HR	SCF/HR	SCF/D													
	Burners	No. Units	MMBTU/HR	SCF/HR	SCF/D	HR/D	DAYS	ENGINE HR/year	PM	SOx	NOx	VOC	CO	PM	SOx	NOx	VOC	CO
	FIRED EQUIPMENT																	
	Firewater Pump Engines (CAT3406)	4	500	24.15	579.6			700	4.41	6.47	61.73	4.94	13.36	0.39	0.57	5.40	0.43	1.17
	SOLAR Titan 130 Turbines	4	123.7	117,474	2,819,373			31730	3.27	0.00	48.49	16.82	58.88	12.95	0.00	192.33	66.73	233.54
	Essential Services Generator (CAT3612)	1	3,688	178	4,275			432	2.60	11.94	89.44	2.68	19.51	0.56	2.58	19.32	0.58	4.21
	MISC.		BPD	SCF/HR	COUNT													
	Storage Tank Breathing & Working Losses		1	[redacted]	[redacted]	24	365		0	0	0	0.00125					0.01	
	*LP Flare		[redacted]	4783.105023	[redacted]	24	365		0	0.00	0.34	0.70	1.86	0	0.00	1.50	3.08	8.14
	LP Pilots (100 SCFH per pilot, 3 pilots per tip)		[redacted]	600	[redacted]	24	365		0	0.00	0.04	0.09	0.23	0	0.00	0.19	0.39	1.02
	HP Flare Pilots		[redacted]	325	[redacted]	24	365		0	0.00000	0.02	0.05	0.13	0	0.00	0.10	0.21	0.55
	HP Flare from PSV leakage		[redacted]	71.462	[redacted]	24	365		0	0.00000	0.01	0.03	0.03	0	0.00	0.02	0.05	0.12
	HP Flare from Maintenance Depressurization		[redacted]	208333.3333	[redacted]	1	12		0	0.00	14.88	30.63	80.94	0	0.000	0.09	0.18	0.49
	Total Flaring Emissions		[redacted]		[redacted]				*0*	*0.00*	*15.29*	*31.47*	*83.18*	*0.00*	*0.00*	*1.90*	*3.90*	*10.32*
	Fugitives		[redacted]			24	365					0.2583					1.13	
	TOTAL OPERATIONAL EMISSIONS													13.90	3.14	218.94	72.78	249.24

* The hourly emissions from the low pressure flare were estimated using average LP flare throughput, because hourly maximum throughput values were not available

Table B.3 Summary of Operational Emissions from Stationary Sources

	MAXIMUM POTENTIAL POUNDS PER HOUR					ESTIMATED ACTUAL TONS/YR				
	PM	SOx	NOx	VOC	CO	PM	SOx	NOx	VOC	CO
Four 500-hp Firewater Pump Engines (CAT3406	4.4	6.5	61.7	4.9	13.4	0.39	0.57	5.40	0.43	1.17
FOUR 15209-hp SOLAR Titan 130 Turbine Generators	3.3	0.0	48.5	16.8	58.9	12.95	0.00	192.33	66.73	233.54
Essential Services Generator (CAT3612)	2.60	11.94	89.44	2.68	19.51	0.56	2.58	19.32	0.58	4.21
Storage Tank Breathing & Working Losses				0.00125					0.01	
LP Flare	0.00	0.000	0.34	0.70	1.86	0.00	0.000	1.50	3.08	8.14
Flare Pilots	0.00	0.000	0.07	0.14	0.36	0.00	0.000	0.29	0.60	1.57
HP Flare	0.00	0.00	14.88	30.64	80.97	0.00	0.000	0.11	0.23	0.61
Fugitives				0.26					1.13	
TOTAL						**13.90**	**3.14**	**218.94**	**72.78**	**249.24**

Hourly emissions are not totaled as all sources will not operate during the same hour

Table B.4 Performance Data for Gas Turbines

SOLAR TURBINES INCORPORATED DATE RUN: 24-Oct-03
ENGINE PERFORMANCE CODE REV. 3.24 RUN BY: Manoj Dutt

TITAN 130-19501S
GSC
STANDARD
GAS
TLA-1S REV. 2.2
ES-ES2215

DATA FOR MINIMUM PERFORMANCE

Fuel Type CHOICE NATURAL GAS

Elevation	feet	50
Inlet Loss	in H20	4
Exhaust Loss	in H20	4
Engine Inlet Temp.	deg F	95
Relative Humidity	%	60
Elevation Loss	kW	23
Inlet Loss	kW	207
Exhaust Loss	kW	84
Specified Load*	kW	FULL
Net Output Power*	kW	11341
Fuel Flow	mmBtu/h	123.7
Heat Rate*	Btu/kW-I	10907
Therm Eff*	%	31.29
Inlet Air Flow	lbm/hr	352024
Engine Exhaust Flow	lbm/hr	356613
PCD	psiG	210.2
Compensated PTIT	deg F	1400
Exhaust Temperature	deg F	947

FUEL GAS COMPOSITION (VOLUME PERCENT)
LHV (Btu/Scf) = 949.9 SG = 0.5856 W.I. @60F (Btu/Scf) = 1241.3

A =	0	CH4 =	93.4	C2H4 =	0	C2H6 =	6.1964
C3H6 =	0	C3H8 =	0.0132	C4 =	0	C5 =	0
C6 =	0.0001	C7 =	0	C8 =	0	CO =	0
CO2 =	0.0061	H2 =	0	H2O =	0	H2S =	0
N2 =	0.3839	O2 =	0	SO2 =	0.0001	He =	0

*NOTE: ELECTRIC POWER MEASURED AT THE GENERATOR TERMINALS

SOLAR TURBINES INCORPORATED DATE RUN: 24-Oct-03
ENGINE PERFORMANCE CODE REV 3 24 RUN BY: Manoj Dutt

Table B.4 Performance Data for Gas Turbines

NEW EQUIPMENT PREDICTED EMISSION PERFORMANCE

Fuel CHOICE NATURAL GAS Customer
Model TITAN 130-19501S GSC STANDARD GAS
Emissions Data REV 0 0

The following predicted emissions performance is based on the following specific single point (see attached)

kW= 11341, %Full Load= 100 0, Elev= 50 ft, %RH= 60 0, Temperature= 95 0 F

NOX MAX	CO MAX	UHC MAX	
25	50	25	lvd at 15% O2
53.03	64.57	18.49	ton/yr
0.098	0.119	0.034	/MBtu (Fuel LHV)
1.02	1.24	0.36	n/(MWe-hr)
12.11	14.74	4.22	lbm/hr

* NOMINAL EMISSIONS DATA UNAVAILABLE FOR THIS ENGINE

IMPORTANT NOTES

1. For short-term emission limits such as lbs/hr , Solar recommends using "worst case" anticipated operating conditions specific to the application and the site conditions Worst case for one pollutant is not necessarily the same for another. The emission values on this form are only predicted emissions at the specific operating conditions listed.
2. Solar's typical SoLoNOx warranty is for greater than 0 deg F, and between 50% and 100% load for gas fuel, and between 80% and 100% load for liquid fuel. An emission warranty for non-SoLoNOx equipment is for greater than 0 deg F and between 80% and 100% load
3. Fuel must meet Solar standard fuel specification ES 9-98. Predicted emissions are based on the attached fuel composition, or, San Diego natural gas or equivalent.
4. If needed, Solar can provide generic documents to address turbine operation outside typical warranty ranges, as well as non-warranted emissions of SO2, PM10/2 5, VOC, and formaldehyde.
5. Solar can optionally provide factory testing in San Diego to ensure the actual unit(s) meet the above values within the tolerances quoted. Pricing and schedule impact will be provided upon request

Table B.5 Pearl Crossing Offshore Terminal Hazardous Air Pollutant Emissions

Hazardous Air Pollutant Emission Factors

Emissions Unit ID	Equipment Description	Rating (HP)	Fuel Use	Fuel Use Units	engine-hours per year	1,3-Butadiene	2-Methylnaphthalene	3-Methylchloranthrene	7,12-Dimethylbenz(a)anthracene	Acenaphthene	Acenaphthylene	Acetaldehyde	Acrolein	Anthracene	Benz(a)anthracene	Benzene	Benzo(a)pyrene	Benzo(b)fluoranthene	Benzo(g,h,i)perylene	Benzo(k)fluoranthene	Chrysene	Dibenzo(a,h)anthracene	Dichlorobenzene	Ethylbenzene	Fluoranthene	Fluorene	Formaldehyde	Hexane	Hydrogen Sulfide	Indeno(1,2,3-cd)pyrene	Naphthalene	Phenanthrene	Propylene	Pyrene	Toluene	TOTAL PAH	Xylenes	Units
					CAS # ==>	106-99-0	91-57-6	56-49-5	57-97-6	83-32-9	208-96-8	75-07-0	107-02-8	120-12-7	56-55-3	71-43-2	50-32-8	205-99-2	191-24-2	207-08-9	218-01-9	53-70-3	25321-22-6	100-41-4	206-44-0	86-73-7	50-00-0	110-54-3	7783-06-4	193-39-5	91-20-3	85-01-8	115-07-1	129-00-0	108-88-3	0	1330-20-7	
Gas Generators	Gas Turbines	15209	123.7	MMBtu/hr	31730	4.30E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.00E-05	6.40E-06	0.00E+00	0.00E+00	1.20E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.20E-05	0.00E+00	0.00E+00	7.10E-04	0.00E+00	0.00E+00	0.00E+00	1.30E-06	0.00E+00	2.90E-05	0.00E+00	1.30E-04	2.20E-06	6.40E-05	lb/MMBtu
Essential Services Generator	IC Diesel Engine	3688	171.6	gal/hr	431	0	0	0	0	0.00000468	0.00000923	0.0000252	0.00000788	0.00000123	6.22E-07	0.000778	2.57E-07	1.11E-06	5.56E-07	2.16E-07	1.53E-06	3.46E-07	0	0	4.03E-06	1.28E-05	7.89E-05	0	0	4.14E-07	0.00013	4.08E-05	0.00279	3.71E-06	0.000281	0.000212	0.000193	lb/MMBtu
Fire Water Pumps	IC Gas Engines (Fire Water Pumps)	500	24.2	gal/hr	700	3.91E-05	0.00E+00	0.00E+00	0.00E+00	1.42E-06	5.06E-06	7.67E-04	9.25E-05	1.87E-06	1.68E-06	9.33E-04	1.88E-07	9.91E-08	4.89E-07	1.55E-07	3.53E-07	5.83E-07	0.00E+00	0.00E+00	7.81E-06	2.92E-05	1.18E-03	0.00E+00	0.00E+00	3.75E-07	8.48E-05	2.94E-05	2.58E-03	4.78E-06	4.09E-04	1.68E-04	2.85E-04	lb/MMBtu
LP Flare	LP Flare		4783.105	scf/hr	8760	0	0.000024	0.0000018	0.000016	0.0000018	0.0000018	0	0	0.0000024	0.0000018	0.0021	0.0000012	1.8E-06	1.2E-06	1.8E-06	1.8E-06	1.2E-06	0.0012	0	0.000003	2.8E-06	0.075	1.8	0	1.8E-06	0.00081	0.000017	0	0.000005	0.0034	0	0	lb/MMscf
Pilots	LP Flare pilots		925	scf/hr	8760	0	0.000024	0.0000018	0.000016	0.0000018	0.0000018	0	0	0.0000024	0.0000018	0.0021	0.0000012	1.8E-06	1.2E-06	1.8E-06	1.8E-06	1.2E-06	0.0012	0	0.000003	2.8E-06	0.075	1.8	0	1.8E-06	0.00081	0.000017	0	0.000005	0.0034	0	0	lb/MMscf
HP Flare	HP Flare Pilots		208404.5	scf/hr	8772	0	0.000024	0.0000018	0.000016	0.0000018	0.0000018	0	0	0.0000024	0.0000018	0.0021	0.0000012	1.8E-06	1.2E-06	1.8E-06	1.8E-06	1.2E-06	0.0012	0	0.000003	2.8E-06	0.075	1.8	0	1.8E-06	0.00081	0.000017	0	0.000005	0.0034	0	0	lb/MMscf
Fugitives	Components and Tank				8760	0	0	0	0	0	0	0	0	0	0	0.076828	0	0	0	0	0	0	0	0.000825	0	0	0	0	6.246E-05	0	0	0	0	0	0.019988	0	0.002498	lb/hr

Hazardous Air Pollutant Emissions (tons/yr)

Emissions Unit ID	Equipment Description		1,3-Butadiene	2-Methylnaphthalene	3-Methylchloranthrene	7,12-Dimethylbenz(a)anthracene	Acenaphthene	Acenaphthylene	Acetaldehyde	Acrolein	Anthracene	Benz(a)anthracene	Benzene	Benzo(a)pyrene	Benzo(b)fluoranthene	Benzo(g,h,i)perylene	Benzo(k)fluoranthene	Chrysene	Dibenzo(a,h)anthracene	Dichlorobenzene	Ethylbenzene	Fluoranthene	Fluorene	Formaldehyde	Hexane	Hydrogen Sulfide	Indeno(1,2,3-cd)pyrene	Naphthalene	Phenanthrene	Propylene	Pyrene	Toluene	TOTAL PAH	Xylenes	Units
			106-99-0	91-57-6	56-49-5	57-97-6	83-32-9	208-96-8	75-07-0	107-02-8	120-12-7	56-55-3	71-43-2	50-32-8	205-99-2	191-24-2	207-08-9	218-01-9	53-70-3	25321-22-6	100-41-4	206-44-0	86-73-7	50-00-0	110-54-3	7783-06-4	193-39-5	91-20-3	85-01-8	115-07-1	129-00-0	108-88-3	0	1330-20-7	
GEN-001 - 004	Gas Turbines		8.44E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	7.85E-02	1.26E-02	0.00E+00	0.00E+00	2.36E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	6.28E-02	0.00E+00	0.00E+00	1.39E+00	0.00E+00	0.00E+00	0.00E+00	2.55E-03	0.00E+00	5.69E-02	0.00E+00	2.55E-01	4.32E-03	1.26E-01	tons/yr
GEN-005	IC Diesel Engine		0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.43E-05	4.80E-05	1.31E-04	4.10E-05	6.40E-06	3.23E-06	4.04E-03	1.34E-06	5.77E-06	2.89E-06	1.13E-06	7.98E-06	1.50E-06	0.00E+00	0.00E+00	2.10E-05	6.66E-05	4.10E-04	0.00E+00	0.00E+00	2.15E-06	6.78E-04	2.12E-04	1.45E-02	1.93E-05	1.46E-03	1.10E-03	1.00E-03	tons/yr
FWP-001 - 004	IC Gas Engines (Fire Water Pumps)		4.65E-05	0.00E+00	0.00E+00	0.00E+00	1.69E-06	6.02E-06	9.13E-04	1.10E-04	2.22E-06	2.00E-06	1.11E-03	2.24E-07	1.18E-07	5.82E-07	1.84E-07	4.20E-07	6.94E-07	0.00E+00	0.00E+00	9.05E-06	3.47E-05	1.40E-03	0.00E+00	0.00E+00	4.46E-07	1.01E-04	3.50E-05	3.07E-03	5.69E-08	4.87E-04	2.00E-04	3.39E-04	tons/yr
FLR-002	LP Flare		0.00E+00	5.03E-07	3.77E-08	3.35E-07	3.77E-08	3.77E-08	0.00E+00	0.00E+00	5.03E-08	3.77E-08	4.40E-05	2.51E-08	3.77E-08	2.51E-08	3.77E-08	3.77E-08	2.51E-08	2.51E-05	0.00E+00	6.29E-08	5.87E-06	1.57E-03	3.77E-02	0.00E+00	3.77E-08	1.25E-05	3.56E-07	0.00E+00	1.05E-07	7.12E-05	0.00E+00	0.00E+00	tons/yr
FLR-003	Pilots		0.00E+00	9.72E-08	7.29E-09	6.48E-08	7.29E-09	7.29E-09	0.00E+00	0.00E+00	9.72E-09	7.29E-09	8.51E-06	4.86E-09	7.29E-09	4.86E-09	7.29E-09	7.29E-09	4.86E-09	4.86E-06	0.00E+00	1.22E-08	1.13E-06	3.04E-04	7.29E-03	0.00E+00	7.29E-09	2.47E-06	6.89E-05	0.00E+00	2.03E-08	1.38E-05	0.00E+00	0.00E+00	tons/yr
FLR-001	HP Flare		0.00E+00	2.19E-05	1.65E-06	1.46E-05	1.65E-06	1.65E-06	0.00E+00	0.00E+00	2.19E-06	1.65E-06	1.92E-03	1.10E-06	1.65E-06	1.10E-06	1.65E-06	1.65E-06	1.10E-06	1.10E-03	0.00E+00	2.74E-06	2.56E-04	6.86E-02	1.65E+00	0.00E+00	1.65E-06	5.58E-04	1.55E-05	0.00E+00	4.57E-06	3.11E-03	0.00E+00	0.00E+00	tons/yr
Fugitives	Components and Tank		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.37E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.74E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.74E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	8.75E-02	0.00E+00	1.09E-02	tons/yr
			8.90E-04	2.25E-05	1.89E-06	1.50E-05	2.77E-05	5.57E-05	7.95E-02	1.27E-02	1.09E-05	6.92E-06	3.67E-01	2.89E-06	7.58E-06	4.60E-06	3.01E-06	1.91E-05	3.62E-06	1.13E-03	6.55E-02	3.28E-05	1.04E-04	1.47E+00	1.69E+00	2.74E-04	4.29E-06	3.90E-03	2.63E-04	7.45E-02	2.97E-05	3.48E-01	5.62E-03	1.38E-01	tons/yr

Hazardous Air Pollutant Emissions Ranks

Emissions Unit ID	Equipment Description		1,3-Butadiene	2-Methylnaphthalene	3-Methylchloranthrene	7,12-Dimethylbenz(a)anthracene	Acenaphthene	Acenaphthylene	Acetaldehyde	Acrolein	Anthracene	Benz(a)anthracene	Benzene	Benzo(a)pyrene	Benzo(b)fluoranthene	Benzo(g,h,i)perylene	Benzo(k)fluoranthene	Chrysene	Dibenzo(a,h)anthracene	Dichlorobenzene	Ethylbenzene	Fluoranthene	Fluorene	Formaldehyde	Hexane	Hydrogen Sulfide	Indeno(1,2,3-cd)pyrene	Naphthalene	Phenanthrene	Propylene	Pyrene	Toluene	TOTAL PAH	Xylenes	Units
Gas Generators	Gas Turbines		11	12	12	12	12	12	4	8	12	12	7	12	12	12	12	12	12	12	5	12	12	1	12	12	12	10	12	6	12	2	9	3	
Essential Services Generator	IC Diesel Engine		25	25	25	25	13	11	9	12	17	19	2	23	18	20	24	16	22	25	25	14	10	7	25	25	21	6	8	1	15	3	4	5	
Fire Water Pumps	IC Gas Engines (Fire Water Pumps)		10	26	26	26	18	14	4	8	16	17	3	23	25	20	24	22	19	26	26	13	12	2	26	26	21	9	11	1	15	5	7	6	
LP Flare	LP Flare		25	7	14	9	14	14	25	25	13	14	4	22	14	22	14	14	22	5	25	11	12	2	1	25	14	6	8	25	10	3	25	25	
Pilots	LP Flare pilots		25	7	14	9	14	14	25	25	13	14	4	22	14	22	14	14	22	5	25	11	12	2	1	25	14	6	8	25	10	3	25	25	
HP Flare	HP Flare Pilots		25	7	14	9	14	14	25	25	13	14	4	22	14	22	14	14	22	5	25	11	12	2	1	25	14	6	8	25	10	3	25	25	
Fugitives	Components and Tank		6	6	6	6	6	6	6	6	6	6	1	6	6	6	6	6	6	6	4	6	6	6	6	5	6	6	6	6	6	2	6	3	

LP Flare run time provided by Continental Shelf Associates

"LP flare volume of 838 MCF over a 20 year life for the current configurations"
To: David Gettleson of Continental Shelf Associates
From: R. Kent Davis of EMDC Facilities Engineering
Sent 2-17-04, received by URS, 3-24-04

838,000 scf/20yrs
41900 scf/yr

Table B.5 Pearl Crossing Offshore Terminal Hazardous Air Pollutant Emissions

			Hazardous Air Pollutant Emissions Ranks																															
Emissions Unit ID	Equipment Description		1,3-Butadiene	2-Methylnaphthalene	3-Methylchloranthrene	7,12-Dimethylbenz(a)anthracene	Acenaphthene	Acenaphthylene	Acetaldehyde	Acrolein	Anthracene	Benz(a)anthracene	Benzene	Benzo(e)pyrene	Benzo(b)fluoranthene	Benzo(g,h,i)perylene	Benzo(k)fluoranthene	Chrysene	Dibenzo(a,h)anthracene	Dichlorobenzene	Ethylbenzene	Fluoranthene	Fluorene	Formaldehyde	Hexane	Hydrogen Sulfide	Indeno(1,2,3-cd)pyrene	Naphthalene	Phenanathrene	Propylene	Pyrene	Toluene	TOTAL PAH	Xylenes	Units
Gas Generators	Gas Turbines		11	12	12	12	12	12	4	8	12	12	7	12	12	12	12	12	12	12	5	12	12	1	12	12	12	10	12	6	12	2	9	3	
Essential Services Generator	IC Diesel Engine		25	25	25	25	13	11	9	12	17	19	2	23	18	20	24	16	22	25	25	14	10	7	25	25	21	6	8	1	15	3	4	5	
Fire Water Pumps	IC Gas Engines (Fire Water Pumps)		10	26	26	26	18	14	4	8	16	17	3	23	25	20	24	22	19	26	26	13	12	2	26	26	21	9	11	1	15	5	7	6	
LP Flare	LP Flare		25	7	14	9	14	14	25	25	13	14	4	22	14	22	14	14	22	5	25	11	12	2	1	25	14	6	8	25	10	3	25	25	
Pilots	LP Flare pilots		25	7	14	9	14	14	25	25	13	14	4	22	14	22	14	14	22	5	25	11	12	2	1	25	14	6	8	25	10	3	25	25	
HP Flare	HP Flare Pilots		25	7	14	9	14	14	25	25	13	14	4	22	14	22	14	14	22	5	25	11	12	2	1	25	14	6	8	25	10	3	25	25	
Fugitives	Components and Tank		6	6	6	6	6	6	6	6	6	6	1	6	6	6	6	6	6	6	4	6	6	6	6	5	6	6	6	6	6	2	6	3	

LP Flare run time provided by Continental Shelf Associates

"LP flare volume of 838 MCF over a 20 year life for the current configurations"
To: David Gettleson of Continental Shelf Associates
From: R. Kent Davis of EMOC Facilities Engineering
Sent 2-17-04, received by URS, 3-24-04

838,000 scf/20yrs
41900 scf/yr

APPENDIX C

PEARL CROSSING LNG TERMINAL PROJECT AIR EMISSIONS CALPUFF v.5.7 MODELING

Pearl Crossing LNG Terminal Project Air Emissions
CALPUFF v.5.7 Modeling
With SOLAR Titan 130 Natural Gas Turbines

C.1 Approach

To estimate the onshore environmental impacts of air emissions from the proposed Pearl Crossing LNG Terminal, a Lagrangian Atmospheric Dispersion Model was applied in the "screening" mode. The conservative screening approach is believed to result in the overprediction of actual impacts. Results from the screening procedure were then compared to the U.S. Environmental Protection Agency's (EPA) Modeling Significance Levels to determine if more "refined" modeling would be required.

The non-steady-state CALPUFF/CALMET/CALPOST (version 5.7, level 030402) modeling system (http://www.src.com/calpuff/calpuff1.htm) was utilized. The CALPUFF modeling system has three main components: CALMET (a diagnostic three-dimensional meteorological model), CALPUFF (the transport and dispersion model), and CALPOST (a post-processing package). EPA has adopted CALPUFF as the preferred technique for assessing long-range transport of pollutants (source-receptor distances greater than approximately 31 miles [50 kilometers {km}]), and the air quality and visibility impacts of stationary sources on Federal Class I areas (68 Federal Register 18439 – 18482, April 15, 2003). The adoption of the CALPUFF modeling system is codified in Appendix A of "Guideline on Air Quality Models," published as Appendix W of 40 Code of Federal Regulations (CFR) Part 51. CALPUFF is also under consideration by the U.S. Department of Interior (DOI), Minerals Management Service (MMS) as a regulatory model.

The modeling approach used for this analysis is found in "Guide for Applying the EPA Class I Screening Methodology with the CALPUFF Modeling System" (Earth Tech, Inc., January 2002). This methodology is referred to as "CALPUFF-Lite", because it bypasses the need to generate a full three-dimensional wind field with CALMET. Instead, an Industrial Source Complex Short Term (ISCST3) single-station meteorological data field was used. The nearest EPA Class I area, the Breton National Wilderness Area (BNWA), is 245 statute miles (394 km) northeast of the Project location. Since the BNWA is beyond 124 miles (200 km) from the Project, no review of the Project's emissions on Class I areas will likely be required. All other adjacent onshore areas are considered to be EPA Prevention of Significant Deterioration (PSD) Class II areas. EPA has set PSD Class II increments for particulate matter less than 10 microns in diameter (PM_{10}), sulfur dioxide (SO_2), and nitrogen dioxide (NO_2).

Pearl Crossing LNG Terminal Project air emissions were quantified using a modified version of the Microsoft Excel Workbook developed by the Gulf of Mexico offshore oil industry and the MMS (http://www.gomr.mms.gov/homepg/regulate/environ/airquality/Docd_aq.xls). Project Air Emission Computation Factors and Air Emission Calculations workbook worksheets are provided in Appendix B. Air pollutant emissions from all sources listed in Appendix B (natural gas turbines, a diesel essential services generator, diesel firewater pump engines, high- and low-pressure flares) were included in the CALPUFF modeling.

Hourly surface and upper-air meteorological data were obtained from the EPA's Support Center for Regulatory Modeling (SCRAM) on EPA's Technical Transfer Network Web site (http://www.epa.gov/scram001/tt24.htm). The National Weather Service (NWS) station at the Lake Charles Regional Airport was the source of the meteorological data. Figure C-1 is a wind rose depicting the annual distribution of wind speeds and wind directions at the Lake Charles station. These data are considered reasonably representative of the project site. The wind rose

shows both the predominance of southeasterly flow during the warm months and the high frequency of northeasterly winds in the winter. The NWS Station Number LA03937 is located at 30.117 degrees N latitude and 93.217 degrees W longitude in Greenwich Mean Time (GMT) Zone 6. The station elevation is 15 feet (4.6 meters [m]). The latest available set of ASCII data for both the surface and twice-daily radiosonde (upper-air) soundings was 1991. The ASCII data file was expanded using the program MET144.EXE to output data in the NWS CD144 format. Finally, the CD144 data were converted into the ISCST3 data file by the "CALPUFF-RAMMET" program CPRAMMET.EXE contained in the CALPUFF modeling suite. Output from CPRAMMET was the meteorological data file input to the CALPUFF modeling.

The Air Emissions Calculation worksheet in Appendix B was used to determine the maximum tons per year (tpy) of SO_2, PM_{10}, NO_2, and carbon monoxide (CO) emitted by the stationary sources on the proposed terminal. The following emitting sources were included in the modeling:

GEN-001-004	SOLAR Titan 130 turbine generators
GEN-005	Essential services generator (CAT 3612)
FWP-001-004	Firewater pump engines (CAT 3406)
FLR-001	High-pressure flare
FLR-002	Low-pressure flare
FLR-003	Flare pilots

In CALPUFF, the modeling grid was centered on the proposed GBS in West Cameron (WC) Block 220. A ring of discrete receptors (1 degree separation) with a radius of 41 miles (66 km) was deployed around this location. This is the closest distance from the GBS to the Louisiana shoreline. Emissions from all sources were combined and modeled conservatively as a single-point source with the stack parameters of one of the gas turbine generators, since these are the largest source of emissions on the GBS. The stack parameters are listed below.

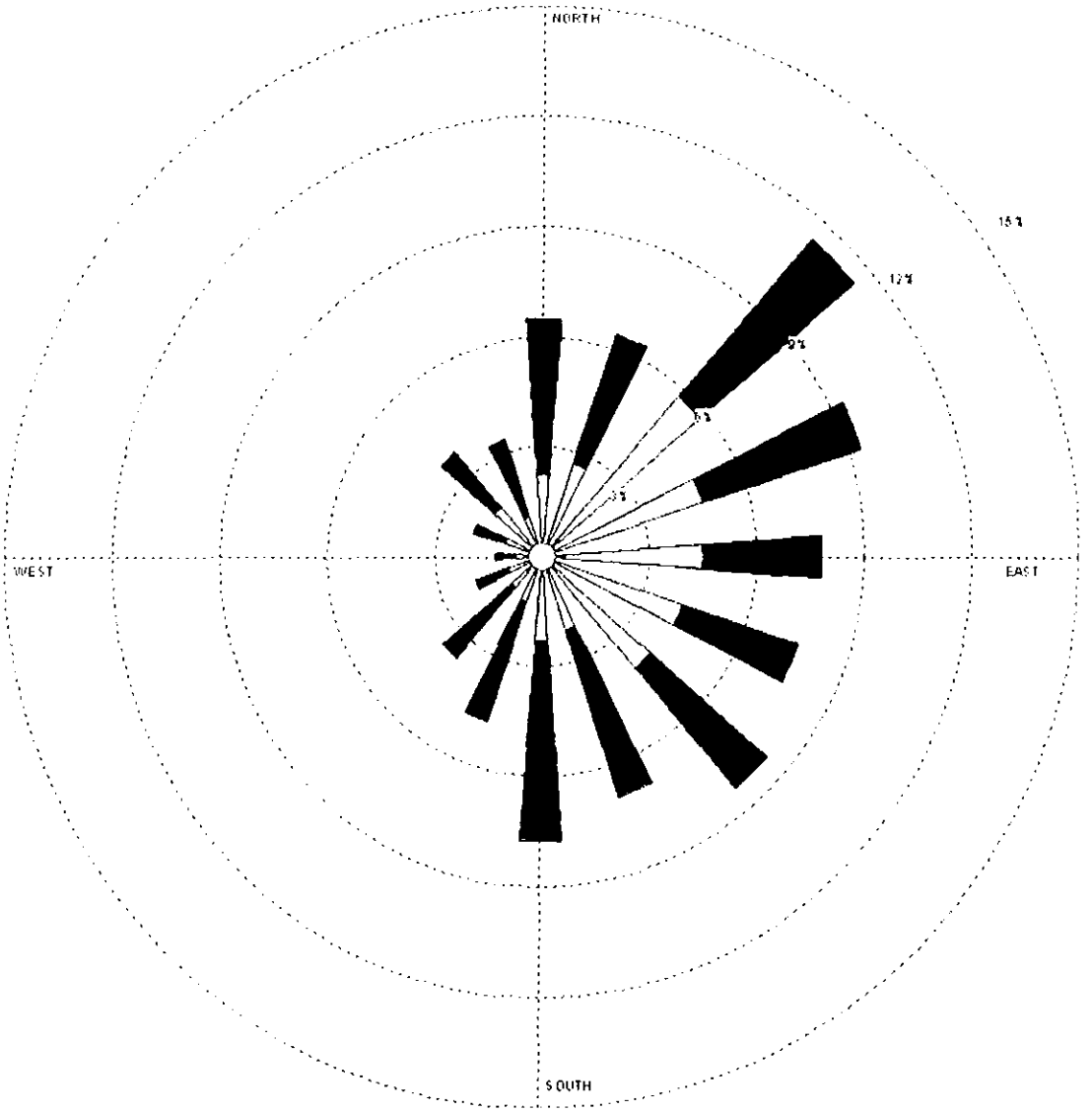
Stack base elevation (on the GBS):	69 feet (21 m)
Stack height above base:	50 feet (15.24 m)
Stack diameter:	8.2 feet (2.5 m)
Exhaust gas temperature	781.5 deg K
Exhaust gas velocity:	66 feet/second (20 m/second)

CALPUFF was used with the emissions estimates for the sources listed above for each hour of one year (8,760 hours). The CALPOST model (version 5.4, level 030402) was used to determine (1) peak SO_2 values for 3-hour, 24-hour, and annual averages; (2) peak NO_2 values for annual averages; (3) peak CO values for 1-hour and 8-hour averages; and (4) peak PM_{10} values for 24-hour, and annual averages, for all discrete receptors (360).

Figure C-1 Wind Rose for Lake Charles Meteorological Station

WIND ROSE PLOT

Station #3937 - Lake Charles, LA



Wind Speed (knots)	MODELER	DATE 4/27/2004	COMPANY NAME **Exxon Mobil**
> 21 17 - 21 11 - 16 7 - 10 4 - 6 1 - 3	DISPLAY **Wind Speed**	UNIT **Knots**	COMMENTS
	AVG WIND SPEED **7.92 Knots**	CALM WINDS **7.03%**	
	ORIENTATION **Direction** **(blowing from)**	PLOT YEAR DATE TIME **1991** **Jan 1 - Dec 31** **Midnight - 11 PM**	PROJECT/PLOT NO **Pearl Crossing Offshore LNG Terminal**

WRPLOT View 3.5 by Lakes Environmental Software - www.lakes-environmental.com

C.2 CALPUFF/CALPOST Modeling Results

Input files used and output files created during the modeling effort are detailed below:

Input:

- CALPUFF ISCST3 Meteorological Data (0393791.ASC – 428 KB)
- CALPUFF Input Data (LNGPUFF.INP – 92 KB)
- CALPOST SO_2 Input Data (SO2POST.INP – 20 KB)
- CALPOST NO_2 Input Data (NOXPOST.INP – 20 KB)
- CALPOST PM_{10} Input Data (PM10POST.INP – 20 KB)
- CALPOST CO Input Data (COPOST.INP – 20 KB)

Output:

- CALPUFF Output Data (LNGCONC.DAT– 19,077 KB)
- CALPOST SO_2 Output Data (SO2LNG.LST – 123 KB)
- CALPOST NO_2 Output Data (NOXLNG.LST – 79 KB)
- CALPOST PM_{10} Output Data (PM10LNG.LST – 101 KB)
- CALPOST CO Output Data (COLNG.LST – 103 KB)

The following are regulatory thresholds for the air pollutants addressed in this analysis:

EPA - National Ambient Air Quality Standards (NAAQS)

PM_{10}	Annual	50 micrograms per cubic meter (μg/m^3)
	24-hour	150 μg/m^3
SO_2	Annual	80 μg/m^3
	24-hour	365 μg/m^3
	3-hour	1300 μg/m^3
NO_2	Annual	100 μg/m^3
CO	8-hour	10 milligrams per cubic meter (mg/m^3)
	1-hour	40 mg/m^3

EPA - Class 2 PSD Increments

PM_{10}	Annual	17 μg/m^3
	24-hour	30 μg/m^3
SO_2	Annual	20 μg/m^3
	24-hour	91 μg/m^3
	3-hour	512 μg/m^3
NO_2	Annual	25 μg/m^3
CO		None

EPA - Modeling Significance Levels

PM_{10}	Annual	1 μg/m^3
	24-hour	5 μg/m^3
SO_2	Annual	1 μg/m^3
	24-hour	5 μg/m^3
	3-hr	25 μg/m^3
NO_2	Annual	1 μg/m^3
CO	8-hour	500 μg/m^3
	1-hour	2000 μg/m^3

CALPUFF/CALPOST modeling results for the proposed Pearl Crossing LNG Terminal operations are shown in Table C-1. These results show that the closest predicted concentration value to a regulatory threshold is the 0.02 μg/m^3 for annual average NO_2, which may be compared with the corresponding Modeling Significance Level concentration of 1 μg/m^3.

Table C-1 Air Dispersion Modeling Results for Terminal Emission Sources

Pollutant	National Ambient Air Quality Standards (NAAQS)[a]					PSD Increments (μg/m^3)		Modeling Significant Levels (μg/m^3)	Modeled Results
	Averaging Period	Primary		Secondary		Class			
		(μg/m^3)	(ppm)	(μg/m^3)	(ppm)	I	II		
PM_{10}	Annual	50	--	50	--	4	17	1	0.0013
	24-hour	150	--	150	--	8	30	5	0.012
SO_2	Annual	(80)	0.03	--	--	2	20	1	0.0003
	24-hour	(365)	0.14	--	--	5	91	5	0.0028
	3-hour	--	--	(1,300)	0.5	25	512	25	0.079
NO_2	Annual	(100)	0.053	(100)	0.053	2.5	25	1	0.020
CO	8-hour	(10 mg/m^3)	9.0	--	--	--	--	500	0.424
	1-hour	(40 mg/m^3)	35	--	--	--	--	2,000	0.868

[a] NAAQS are expressed in μg/m^3 for particulate matter (and lead) and in parts per million (ppm) for the other pollutants. For reference, corresponding equivalent standards are shown in parentheses.