

US EPA ARCHIVE DOCUMENT



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713.830.2000  
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September 10, 2014

Ms. Melanie Magee  
Environmental Engineer, Air Permits Section  
U.S. EPA Region 6, 6PD  
1445 Ross Avenue, Suite 1200  
Dallas, Texas 75202-2733

Re: Revision to Application  
Guadalupe Power Partners LP  
Guadalupe Generating Station  
RN100225820  
CN600132120  
Marion, Guadalupe County, Texas

Dear Ms. Magee:

On February 27, 2014, Calpine Corporation (Calpine) acquired 100% ownership interests of the Guadalupe Generating Station located in Marion, Guadalupe County, Texas. The legal entity for the power plant will continue to be Guadalupe Power Partners LP. Guadalupe Power Partners has a Greenhouse Gas (GHG) Prevention of Significant Deterioration (PSD) permit application No. PSD-TX-1310-GHG pending before EPA Region 6.

Included in Attachment A to this letter is an updated Form PI-1, General Application for Air Preconstruction Permit and Amendment, which contains new company contact and technical contact information for the pending application.

The original application for this project included GHG emission calculations and Best Available Control Technology (BACT) information for four combustion turbine options: General Electric (GE) Model 7FA.03, 7FA.04, or 7FA.05 and Siemens Westinghouse (SW) 5000F(5). Included in Attachment B to this letter are revised GHG emission calculations for the GE 7FA.05 combustion turbine which include updated global warming potential factors from 40 CFR Part 98, Subpart A, Table A-1. The method for calculating CO<sub>2</sub> emissions from the combustion turbines is also changed from the original application. The revised combustion turbine calculations in Attachment B use 40 CFR Part 75, Appendix G, Equation G-4, to calculate CO<sub>2</sub> emissions as specified in 40 CFR 98, Subpart D for electric generating units subject to the Acid Rain Program.

Included in Attachment C to this letter are revised calculations for the GE 7FA.05 showing the proposed BACT output based limit. The revised BACT calculations use the updated global warming potential factors and 40 CFR Part 75, Appendix G, Equation G-4, for calculating CO<sub>2</sub> emissions from the combustion turbines.

Should you have questions concerning this application revision, or require further information, please do not hesitate to contact me at (713) 830-8717 or Mr. Larry Moon of Zephyr Environmental Corporation at (512) 879-6619.

Sincerely,



Patrick Blanchard  
Director, Environmental Services

Enclosure

cc: Mr. Mike Wilson, P.E., Director, Air Permits Division, TCEQ  
Mr. George Ortiz, Air Section Manager, TCEQ Region 13  
Ms. Stephanie Kordzi, EPA Region 6 (electronic copy by email)  
Mr. Larry A. Moon, P.E., Zephyr Environmental Corporation

ATTACHMENT A

PI-1 Form



**Texas Commission on Environmental Quality  
Form PI-1 General Application for  
Air Preconstruction Permit and Amendment**

Important Note: The agency requires that a Core Data Form be submitted on all incoming applications unless a Regulated Entity and Customer Reference Number have been issued and no core data information has changed. For more information regarding the Core Data Form, call (512) 239-5175 or go to [www.tceq.texas.gov/permitting/central\\_registry/guidance.html](http://www.tceq.texas.gov/permitting/central_registry/guidance.html).

<b>I. Applicant Information</b>		
A. Company or Other Legal Name: Guadalupe Power Partners LP		
Texas Secretary of State Charter/Registration Number (if applicable):		
B. Company Official Contact Name: Patrick Blanchard		
Title: Director, Environmental Services		
Mailing Address: 717 Texas Avenue, Suite 1000		
City: Houston	State: TX	ZIP Code: 77002
Telephone No.: 713-830-8717	Fax No.: 713-830-8871	E-mail Address: Patrick.Blanchard@calpine.com
C. Technical Contact Name: Jan Stavinoha, P.E.		
Title: Environmental Manager – Central Power Region		
Company Name: Calpine Construction Finance Company, L.P.		
Mailing Address: 717 Texas Avenue, Suite 1000		
City: Houston	State: TX	ZIP Code: 77002
Telephone No.: 713-570-4814	Fax No.: 713-830-8871	E-mail Address: jstavinoha@calpine.com
D. Site Name: Guadalupe Generating Station		
E. Area Name/Type of Facility: Combustion Turbines CTG-7 and CTG-8		<input checked="" type="checkbox"/> Permanent <input type="checkbox"/> Portable
F. Principal Company Product or Business: Electrical Power Generation		
Principal Standard Industrial Classification Code (SIC): 4911		
Principal North American Industry Classification System (NAICS): 221112		
G. Projected Start of Construction Date: October 2014		
Projected Start of Operation Date: March 2015		
H. Facility and Site Location Information (If no street address, provide clear driving directions to the site in writing.):		
Street Address: 5740 Weil Road		
City/Town: Marion	County: Guadalupe	ZIP Code: 78124
Latitude (nearest second): 29.625517		Longitude (nearest second): 98.145064

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<b>I. Applicant Information (continued)</b>	
I. Account Identification Number (leave blank if new site or facility): GLO135F	
J. Core Data Form.	
Is the Core Data Form (Form 10400) attached? If No, provide customer reference number and regulated entity number (complete K and L).	<input type="checkbox"/> YES <input checked="" type="checkbox"/> NO
K. Customer Reference Number (CN): 600132120	
L. Regulated Entity Number (RN): 100225820	
<b>II. General Information</b>	
A. Is confidential information submitted with this application? If Yes, mark each confidential page confidential in large red letters at the bottom of each page.	<input type="checkbox"/> YES <input checked="" type="checkbox"/> NO
B. Is this application in response to an investigation, notice of violation, or enforcement action? If Yes, attach a copy of any correspondence from the agency and provide the RN in section I.L. above.	<input type="checkbox"/> YES <input checked="" type="checkbox"/> NO
C. Number of New Jobs:	
D. Provide the name of the State Senator and State Representative and district numbers for this facility site:	
State Senator: Donna Campbell	District No.: 25
State Representative: John Kuempel	District No.: 44
<b>III. Type of Permit Action Requested</b>	
A. Mark the appropriate box indicating what type of action is requested. <input checked="" type="checkbox"/> Initial <input type="checkbox"/> Amendment <input type="checkbox"/> Revision (30 TAC 116.116(e)) <input type="checkbox"/> Change of Location <input type="checkbox"/> Relocation	
B. Permit Number (if existing): PSD-TX-1310GHG	
C. Permit Type: Mark the appropriate box indicating what type of permit is requested. (check all that apply, skip for change of location) <input checked="" type="checkbox"/> Construction <input type="checkbox"/> Flexible <input type="checkbox"/> Multiple Plant <input type="checkbox"/> Nonattainment <input type="checkbox"/> Plant-Wide Applicability Limit <input checked="" type="checkbox"/> Prevention of Significant Deterioration <input type="checkbox"/> Hazardous Air Pollutant Major Source <input type="checkbox"/> Other:	
D. Is a permit renewal application being submitted in conjunction with this amendment in accordance with 30 TAC 116.315(c).	<input type="checkbox"/> YES <input checked="" type="checkbox"/> NO



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<b>III. Type of Permit Action Requested (continued)</b>		
E. Is this application for a change of location of previously permitted facilities? If Yes, complete III.E.1 - III.E.4.0		<input type="checkbox"/> YES <input checked="" type="checkbox"/> NO
1. Current Location of Facility (If no street address, provide clear driving directions to the site in writing.):		
Street Address:		
City:	County:	ZIP Code:
2. Proposed Location of Facility (If no street address, provide clear driving directions to the site in writing.):		
Street Address:		
City:	County:	ZIP Code:
3. Will the proposed facility, site, and plot plan meet all current technical requirements of the permit special conditions? If "NO", attach detailed information.		<input type="checkbox"/> YES <input type="checkbox"/> NO
4. Is the site where the facility is moving considered a major source of criteria pollutants or HAPs?		<input type="checkbox"/> YES <input type="checkbox"/> NO
F. Consolidation into this Permit: List any standard permits, exemptions or permits by rule to be consolidated into this permit including those for planned maintenance, startup, and shutdown.		
List: N/A		
G. Are you permitting planned maintenance, startup, and shutdown emissions? If Yes, attach information on any changes to emissions under this application as specified in VII and VIII.		<input checked="" type="checkbox"/> YES <input type="checkbox"/> NO
H. Federal Operating Permit Requirements (30 TAC Chapter 122 Applicability) Is this facility located at a site required to obtain a federal operating permit? If Yes, list all associated permit number(s), attach pages as needed).		<input checked="" type="checkbox"/> YES <input type="checkbox"/> NO <input type="checkbox"/> To be determined
Associated Permit No (s.): O-2071		
1. Identify the requirements of 30 TAC Chapter 122 that will be triggered if this application is approved.		
<input checked="" type="checkbox"/> FOP Significant Revision <input type="checkbox"/> FOP Minor <input type="checkbox"/> Application for an FOP Revision <input type="checkbox"/> Operational Flexibility/Off-Permit Notification <input type="checkbox"/> Streamlined Revision for GOP <input type="checkbox"/> To be Determined <input type="checkbox"/> None		

TCEQ-10252 (Revised 09/13) PI-1 Instructions  
This form is for use by facilities subject to air quality requirements and may be revised periodically. (APDG 5171v20)



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<b>III. Type of Permit Action Requested (continued)</b>	
H. Federal Operating Permit Requirements (30 TAC Chapter 122 Applicability) (continued)	
2. Identify the type(s) of FOP(s) issued and/or FOP application(s) submitted/pending for the site. (check all that apply)	
<input type="checkbox"/> GOP Issued	<input type="checkbox"/> GOP application/revision application submitted or under APD review
<input checked="" type="checkbox"/> SOP Issued	<input type="checkbox"/> SOP application/revision application submitted or under APD review
<b>IV. Public Notice Applicability</b>	
A. Is this a new permit application or a change of location application?	<input checked="" type="checkbox"/> YES <input type="checkbox"/> NO
B. Is this application for a concrete batch plant? If Yes, complete V.C.1 – V.C.2.	<input type="checkbox"/> YES <input checked="" type="checkbox"/> NO
C. Is this an application for a major modification of a PSD, nonattainment, FCAA 112(g) permit, or exceedance of a PAL permit?	<input type="checkbox"/> YES <input checked="" type="checkbox"/> NO
D. Is this application for a PSD or major modification of a PSD located within 100 kilometers or less of an affected state or Class I Area?	<input type="checkbox"/> YES <input checked="" type="checkbox"/> NO
If Yes, list the affected state(s) and/or Class I Area(s).	
E. Is this a state permit amendment application? If Yes, complete IV.E.1. – IV.E.3.	<b>No</b>
1. Is there any change in character of emissions in this application?	<input type="checkbox"/> YES <input type="checkbox"/> NO
2. Is there a new air contaminant in this application?	<input type="checkbox"/> YES <input type="checkbox"/> NO
3. Do the facilities handle, load, unload, dry, manufacture, or process grain, seed, legumes, or vegetables fibers (agricultural facilities)?	<input type="checkbox"/> YES <input type="checkbox"/> NO
F. List the total annual emission increases associated with the application (List all that apply and attach additional sheets as needed): (maximum emissions of all four CT manufacturers and models)	
Volatile Organic Compounds (VOC):	
Sulfur Dioxide (SO <sub>2</sub> ):	
Carbon Monoxide (CO):	
Nitrogen Oxides (NO <sub>x</sub> ):	
Particulate Matter (PM):	
PM 10 microns or less (PM <sub>10</sub> ):	
PM 2.5 microns or less (PM <sub>2.5</sub> ):	
Lead (Pb):	
Hazardous Air Pollutants (HAPs):	
Other speciated air contaminants not listed above: GHG (as CO <sub>2e</sub> ) – 611,660 tons per year	



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<b>V. Public Notice Information (complete if applicable)</b>		
A. Public Notice Contact Name: Ms. Jan Stavinoha		
Title: Environmental Manager – Central Power Region		
Mailing Address: 717 Texas Avenue, Suite 1000		
City: Houston	State: Texas	ZIP Code: 77002
B. Name of the Public Place: N/A		
Physical Address (No P.O. Boxes):		
City:	County:	ZIP Code:
The public place has granted authorization to place the application for public viewing and copying. N/A		<input type="checkbox"/> YES <input type="checkbox"/> NO
The public place has internet access available for the public. N/A		<input type="checkbox"/> YES <input type="checkbox"/> NO
C. Concrete Batch Plants, PSD, and Nonattainment Permits		
1. County Judge Information (For Concrete Batch Plants and PSD and/or Nonattainment Permits) for this facility site.		
The Honorable: Larry Jones		
Mailing Address: 211 West Court Street		
City: Seguin	State: Texas	ZIP Code: 78155
2. Is the facility located in a municipality or an extraterritorial jurisdiction of a municipality? (For Concrete Batch Plants)		<input type="checkbox"/> YES <input type="checkbox"/> NO
Presiding Officers Name(s):		
Title:		
Mailing Address:		
City:	State:	ZIP Code:
3. Provide the name, mailing address of the chief executive and Indian Governing Body; and identify the Federal Land Manager(s) for the location where the facility is or will be located.		
Chief Executive: Mayor Glenn A. Hild		
Mailing Address: P. O. Box 158		
City: Marion	State: Texas	ZIP Code: 78124
Name of the Indian Governing Body: N/A		
Mailing Address:		
City:	State:	ZIP Code:

TCEQ-10252 (Revised 09/13) PI-1 Instructions  
This form is for use by facilities subject to air quality requirements and may be revised periodically. (APDG 5171v20)



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<b>V. Public Notice Information (complete if applicable) (continued)</b>	
C. Concrete Batch Plants, PSD, and Nonattainment Permits	
3. Provide the name, mailing address of the chief executive and Indian Governing Body; and identify the Federal Land Manager(s) for the location where the facility is or will be located. (continued)	
Name of the Federal Land Manager(s):	
D. Bilingual Notice	
Is a bilingual program required by the Texas Education Code in the School District? N/A	<input type="checkbox"/> YES <input type="checkbox"/> NO
Are the children who attend either the elementary school or the middle school closest to your facility eligible to be enrolled in a bilingual program provided by the district? N/A	<input type="checkbox"/> YES <input type="checkbox"/> NO
If Yes, list which languages are required by the bilingual program?	N/A
<b>VI. Small Business Classification (Required)</b>	
A. Does this company (including parent companies and subsidiary companies) have fewer than 100 employees or less than \$6 million in annual gross receipts?	<input type="checkbox"/> YES <input checked="" type="checkbox"/> NO
B. Is the site a major stationary source for federal air quality permitting?	<input checked="" type="checkbox"/> YES <input type="checkbox"/> NO
C. Are the site emissions of any regulated air pollutant greater than or equal to 50 tpy?	<input checked="" type="checkbox"/> YES <input type="checkbox"/> NO
D. Are the site emissions of all regulated air pollutants combined less than 75 tpy?	<input type="checkbox"/> YES <input checked="" type="checkbox"/> NO
<b>VII. Technical Information</b>	
A. The following information must be submitted with your Form PI-1 (this is just a checklist to make sure you have included everything)	
1. <input checked="" type="checkbox"/> Current Area Map	
2. <input checked="" type="checkbox"/> Plot Plan	
3. <input type="checkbox"/> Existing Authorizations	
4. <input checked="" type="checkbox"/> Process Flow Diagram	
5. <input checked="" type="checkbox"/> Process Description	
6. <input checked="" type="checkbox"/> Maximum Emissions Data and Calculations	
7. <input type="checkbox"/> Air Permit Application Tables	
a. <input type="checkbox"/> Table 1(a) (Form 10153) entitled, Emission Point Summary	
b. <input type="checkbox"/> Table 2 (Form 10155) entitled, Material Balance	
c. <input type="checkbox"/> Other equipment, process or control device tables	
B. Are any schools located within 3,000 feet of this facility?	<input type="checkbox"/> YES <input checked="" type="checkbox"/> NO



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<b>VII. Technical Information</b>			
C. Maximum Operating Schedule:			
Hour(s): 24 per day	Day(s): 7 per week	Week(s): 52 per year	Year(s): 2,500 hours/year
Seasonal Operation? If Yes, please describe in the space provide below.			<input type="checkbox"/> YES <input checked="" type="checkbox"/> NO
D. Have the planned MSS emissions been previously submitted as part of an emissions inventory?			<input type="checkbox"/> YES <input checked="" type="checkbox"/> NO
Provide a list of each planned MSS facility or related activity and indicate which years the MSS activities have been included in the emissions inventories. Attach pages as needed.			
E. Does this application involve any air contaminants for which a disaster review is required?			<input type="checkbox"/> YES <input checked="" type="checkbox"/> NO
F. Does this application include a pollutant of concern on the Air Pollutant Watch List (APWL)?			<input type="checkbox"/> YES <input checked="" type="checkbox"/> NO
<b>VIII. State Regulatory Requirements</b> <b>Applicants must demonstrate compliance with all applicable state regulations to obtain a permit or amendment. The application must contain detailed attachments addressing applicability or non applicability; identify state regulations; show how requirements are met; and include compliance demonstrations.</b>			
A. Will the emissions from the proposed facility protect public health and welfare, and comply with all rules and regulations of the TCEQ?			<input checked="" type="checkbox"/> YES <input type="checkbox"/> NO
B. Will emissions of significant air contaminants from the facility be measured?			<input checked="" type="checkbox"/> YES <input type="checkbox"/> NO
C. Is the Best Available Control Technology (BACT) demonstration attached?			<input checked="" type="checkbox"/> YES <input type="checkbox"/> NO
D. Will the proposed facilities achieve the performance represented in the permit application as demonstrated through recordkeeping, monitoring, stack testing, or other applicable methods?			<input checked="" type="checkbox"/> YES <input type="checkbox"/> NO
<b>IX. Federal Regulatory Requirements</b> <b>Applicants must demonstrate compliance with all applicable federal regulations to obtain a permit or amendment. The application must contain detailed attachments addressing applicability or non applicability; identify federal regulation subparts; show how requirements are met; and include compliance demonstrations.</b>			
A. Does Title 40 Code of Federal Regulations Part 60, (40 CFR Part 60) New Source Performance Standard (NSPS) apply to a facility in this application?			<input checked="" type="checkbox"/> YES <input type="checkbox"/> NO
B. Does 40 CFR Part 61, National Emissions Standard for Hazardous Air Pollutants (NESHAP) apply to a facility in this application?			<input type="checkbox"/> YES <input checked="" type="checkbox"/> NO



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<b>IX. Federal Regulatory Requirements</b>	
<b>Applicants must demonstrate compliance with all applicable federal regulations to obtain a permit or amendment. The application must contain detailed attachments addressing applicability or non applicability; identify federal regulation subparts; show how requirements are met; and include compliance demonstrations.</b>	
C. Does 40 CFR Part 63, Maximum Achievable Control Technology (MACT) standard apply to a facility in this application?	<input type="checkbox"/> YES <input checked="" type="checkbox"/> NO
D. Do nonattainment permitting requirements apply to this application?	<input type="checkbox"/> YES <input checked="" type="checkbox"/> NO
E. Do prevention of significant deterioration permitting requirements apply to this application?	<input checked="" type="checkbox"/> YES <input type="checkbox"/> NO
F. Do Hazardous Air Pollutant Major Source [FCAA 112(g)] requirements apply to this application?	<input type="checkbox"/> YES <input checked="" type="checkbox"/> NO
G. Is a Plant-wide Applicability Limit permit being requested?	<input type="checkbox"/> YES <input checked="" type="checkbox"/> NO
<b>X. Professional Engineer (P.E.) Seal</b>	
Is the estimated capital cost of the project greater than \$2 million dollars?	<input checked="" type="checkbox"/> YES <input type="checkbox"/> NO
If Yes, submit the application under the seal of a Texas licensed P.E.	
<b>XI. Permit Fee Information</b>	
Check, Money Order, Transaction Number ,ePay Voucher Number:	Fee Amount: \$ N/A
Paid online? N/A	<input type="checkbox"/> YES <input type="checkbox"/> NO
Company name on check: N/A	
Is a copy of the check or money order attached to the original submittal of this application?	<input type="checkbox"/> YES <input type="checkbox"/> NO <input checked="" type="checkbox"/> N/A
Is a Table 30 (Form 10196) entitled, Estimated Capital Cost and Fee Verification, attached?	<input type="checkbox"/> YES <input type="checkbox"/> NO <input checked="" type="checkbox"/> N/A



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**XII. Delinquent Fees and Penalties**

This form will not be processed until all delinquent fees and/or penalties owed to the TCEQ or the Office of the Attorney General on behalf of the TCEQ is paid in accordance with the Delinquent Fee and Penalty Protocol. For more information regarding Delinquent Fees and Penalties, go to the TCEQ Web site at: [www.tceq.texas.gov/agency/delin/index.html](http://www.tceq.texas.gov/agency/delin/index.html).

**XIII. Signature**

The signature below confirms that I have knowledge of the facts included in this application and that these facts are true and correct to the best of my knowledge and belief. I further state that to the best of my knowledge and belief, the project for which application is made will not in any way violate any provision of the Texas Water Code (TWC), Chapter 7, Texas Clean Air Act (TCAA), as amended, or any of the air quality rules and regulations of the Texas Commission on Environmental Quality or any local governmental ordinance or resolution enacted pursuant to the TCAA I further state that I understand my signature indicates that this application meets all applicable nonattainment, prevention of significant deterioration, or major source of hazardous air pollutant permitting requirements. The signature further signifies awareness that intentionally or knowingly making or causing to be made false material statements or representations in the application is a criminal offense subject to criminal penalties.

Name: *Patrick Blanchard*

Signature: *[Handwritten Signature]*

*Original Signature Required*

Date: *9.10.14*

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ATTACHMENT B  
GHG EMISSION CALCULATIONS

Table B-1  
 Project GHG Emission Summary  
 Guadalupe Power Partners LP

Name	EPN	CO <sub>2</sub> ton/yr	CH <sub>4</sub> ton/yr	N <sub>2</sub> O ton/yr	SF <sub>6</sub> ton/yr	Total GHG Mass Emissions ton/yr	Total CO <sub>2</sub> e ton/yr
CTG 7 (GE 7FA.05)	CTG-7	305,446.7	5.67	0.57		305,452.92	305,757.16
CTG 8 (GE 7FA.05)	CTG-8	305,446.7	5.67	0.57		305,452.92	305,757.16
Natural Gas Fugitives	NG1	0.06	2.04			2.09	50.93
Fire Water Pump	FP-3	15.62	0.00063	0.00013		15.62	15.67
SF <sub>6</sub> Insulated Equipment	SF6FUG				0.0035	0.00345	78.66
Sitewide Emissions		610,909.06	13.37	1.13	0.0035	610,923.57	611,659.59

**Table B-2**  
**GHG Annual Emission Calculations - GE 7FA.05 Simple Cycle Combustion Turbines**  
**Guadalupe Power Partners LP**

EPN	Average Heat Input (MMBtu/hr)	Operating Hours	Annual Heat Input (MMBtu/yr)	Pollutant	Emission Factor (lb/MMBtu) <sup>1</sup>	GHG Mass Emissions <sup>2</sup> (tpy)	Global Warming Potential <sup>3</sup>	CO <sub>2</sub> e (tpy)
CTG-7 (GE 7FA.05)	2,055.89	2,500	5,139,728	CO <sub>2</sub>	118.86	305,446.69	1	305,446.69
				CH <sub>4</sub>	2.2E-03	5.67	25	141.64
				N <sub>2</sub> O	2.2E-04	0.57	298	168.83
<b>Total:</b>						<b>305,452.92</b>		<b>305,757.16</b>
CTG-8 (GE 7FA.05)	2,055.89	2,500	5,139,728	CO <sub>2</sub>	118.86	305,446.69	1	305,446.69
				CH <sub>4</sub>	2.2E-03	5.67	25	141.64
				N <sub>2</sub> O	2.2E-04	0.57	298	168.83
<b>Total:</b>						<b>305,452.92</b>		<b>305,757.16</b>
<b>Total for 2 Turbines:</b>						<b>610,905.85</b>		<b>611,514.33</b>

Note

1. CH<sub>4</sub> and N<sub>2</sub>O GHG factors based on Table C-2 of 40 CFR 98 Mandatory Greenhouse Gas Reporting.
2. CO<sub>2</sub> emissions based on 40 CFR Part 75, Appendix G, Equation G-4  
 $W_{CO_2} = (F_c \times H \times U_f \times MW_{CO_2}) / 2000$   
 $W_{CO_2}$  = CO<sub>2</sub> emitted from combustion, tons/yr  
 $F_c$  = Carbon based F-factor, 1040 scf/MMBtu  
 $H$  = Heat Input (MMBtu/yr)  
 $U_f$  = 1/385 scf CO<sub>2</sub>/lbmole at 14.7 psia and 68 °F  
 $MW_{CO_2}$  = Molecule weight of CO<sub>2</sub>, 44.0 lb/lb-mole
3. Global Warming Potential factors based on Table A-1 of 40 CFR 98 Mandatory Greenhouse Gas Reporting.

**Table B-3**  
**GHG Startup Emission Calculations - GE 7FA.05 Simple Cycle Combustion Turbines**  
**Guadalupe Power Partners LP**

EPN	Heat Input Per Startup (MMBtu)	Pollutant	Emission Factor (lb/MMBtu) <sup>1</sup>	GHG Mass Emissions <sup>2</sup> (tons/event)	Global Warming Potential <sup>3</sup>	CO <sub>2</sub> e (tons/event)
CTG-7 (GE 7FA.05)	714.3	CO <sub>2</sub>	118.86	42.45	1	42.45
		CH <sub>4</sub>	2.2E-03	0.0008	25	0.02
		N <sub>2</sub> O	2.2E-04	0.0001	298	0.02
<b>Total:</b>				<b>42.45</b>		<b>42.49</b>
CTG-8 (GE 7FA.05)	714.3	CO <sub>2</sub>	118.86	42.45	1	42.45
		CH <sub>4</sub>	2.2E-03	0.0008	25	0.02
		N <sub>2</sub> O	2.2E-04	0.0001	298	0.02
<b>Total:</b>				<b>42.45</b>		<b>42.49</b>
<b>Total for 2 Turbines:</b>				<b>84.90</b>		<b>84.98</b>

**Note**

1. CH<sub>4</sub> and N<sub>2</sub>O GHG factors based on Table C-2 of 40 CFR 98 Mandatory Greenhouse Gas Reporting.
2. CO<sub>2</sub> emissions based on 40 CFR Part 75, Appendix G, Equation G-4  
 $W_{CO_2} = (F_c \times H \times U_f \times MW_{CO_2}) / 2000$   
 $W_{CO_2}$  = CO<sub>2</sub> emitted from combustion, tons/yr  
 $F_c$  = Carbon based F-factor, 1040 scf/MMBtu  
 $H$  = Heat Input (MMBtu/yr)  
 $U_f$  = 1/385 scf CO<sub>2</sub>/lbmole at 14.7 psia and 68 °F  
 $MW_{CO_2}$  = Molecule weight of CO<sub>2</sub>, 44.0 lb/lb-mole
3. Global Warming Potential factors based on Table A-1 of 40 CFR 98 Mandatory Greenhouse Gas Reporting.

**Table B-4**  
**GHG Emission Calculations - Fire Water Pump Engine**  
**Guadalupe Power Partners LP**

**Assumptions:**

	<b>Fire Water Pump</b>	
Annual Operating Schedule:	100	hours/year
Max Hourly Heat Input:	1.92	MMBtu/hr
Annual Heat Input:	192.0	MMBtu/yr

EPN	Heat Input (MMBtu/yr)	Pollutant	Emission Factor (kg/MMBtu) <sup>2</sup>	GHG Mass Emissions (tpy)	Global Warming Potential <sup>3</sup>	CO <sub>2</sub> e (tpy)
FP-3	192.0	CO <sub>2</sub>	73.96	15.62	1	15.62
		CH <sub>4</sub>	3.0E-03	0.00063	25	0.016
		N <sub>2</sub> O	6.0E-04	0.00013	298	0.038
<b>Total:</b>				<b>15.62</b>		<b>15.67</b>

Calculation Procedure

*Annual Emission Rate = annual heat Input X Emission Factor X 2.2 lbs/kg X Global Warming Potential / 2,000 lbs/ton*

Note

1. Default high heat value based on Table C-1 of 40 CFR 98 Mandatory Greenhouse Gas Reporting.
2. GHG factors based on Tables C-1 and C-2 of 40 CFR 98 Mandatory Greenhouse Gas Reporting.
3. Global Warming Potential factors based on Table A-1 of 40 CFR 98 Mandatory Greenhouse Gas Reporting.

Table B-5  
 GHG Emission Calculations - Natural Gas Piping Fugitives  
 Guadalupe Power Partners LP

**GHG Emissions Contribution From Fugitive Natural Gas Piping Components**

EPN	Source Type	Fluid State	Count	Emission Factor <sup>1</sup> (scf/hr/comp)	CO <sub>2</sub> <sup>2</sup> (tpy)	Methane <sup>3</sup> (tpy)	Total (tpy)
NG1	Valves	Gas/Vapor	50	0.121	0.030	1.082	
	Flanges	Gas/Vapor	200	0.017	0.017	0.608	
	Relief Valves	Gas/Vapor	10	0.193	0.010	0.345	
GHG Mass-Based Emissions					0.057	2.04	2.09
Global Warming Potential <sup>4</sup>					1	25	
CO <sub>2</sub> e Emissions					0.057	50.88	50.93

**Note**

1. Emission factors from Table W-1A of 40 CFR 98 Mandatory Greenhouse Gas Reporting Rules
2. CO<sub>2</sub> emissions based on vol% of CO<sub>2</sub> in natural gas 1.00%
3. CH<sub>4</sub> emissions based on vol% of CH<sub>4</sub> in natural gas 98.00%
4. Global Warming Potential factors based on Table A-1 of 40 CFR 98 Mandatory Greenhouse Gas Reporting.

Example calculation:

50 valves	0.121 scf gas	0.01 scf CO <sub>2</sub>	lbmole	44 lb CO <sub>2</sub>	8760 hr	ton =	0.03 ton/yr
	hr * valve	scf gas	385 scf	lbmole	yr	2000 lb	

**Table B-6**  
**GHG Emission Calculations - Electrical Equipment Insulated With SF<sub>6</sub>**  
**Guadalupe Power Partners LP**

**Assumptions**

Insulated circuit breaker SF <sub>6</sub> capacity:	1,380	lb
Estimated annual SF <sub>6</sub> leak rate:	0.5%	by weight
Estimated annual SF <sub>6</sub> mass emission rate:	0.00345	ton/yr
Global Warming Potential <sup>1</sup> :	22,800	
Estimated annual CO <sub>2</sub> e emission rate:	78.66	ton/yr

Note

*Global Warming Potential factors based on Table A-1 of 40 CFR 98 Mandatory Greenhouse Gas Reporting.*

ATTACHMENT C  
OUTPUT BASED BACT CALCULATIONS

**Table C-1**  
**GHG Emission Calculations - Calculation of Design Heat Rate and Output Limits for GE 7FA.05**  
**Guadalupe Power Partners LP**

**Gross Output Basis**

Base Heat Rate: 9,937 Btu/kWh (HHV)  
 Design Margin: 3.3%  
 CTG Performance Margin: 6.0%

**Adjusted Base Heat Rate with Compliance Margins: 10,881 Btu/kWh (HHV)**

EPN	Base Heat Rate (Btu/kWhr)	Electrical Output Basis	Heat Input Required to Produce 1 MW (MMBtu/MWhr)	Pollutant	Emission Factor (lb/MMBtu) <sup>1,2</sup>	lb GHG/MWhr	Global Warming Potential <sup>3</sup>	lb CO <sub>2</sub> e/MWhr <sup>4</sup>
CTG-7 and CTG-8	10,881	Gross	10.88	CO <sub>2</sub>	118.9	1,293.3	1	1,293.3
				CH <sub>4</sub>	2.2E-03	2.40E-02	25	6.00E-01
				N <sub>2</sub> O	2.2E-04	2.40E-03	298	7.15E-01
<b>Total:</b>						<b>1,293.3</b>		<b>1,294.6</b>

**Note**

- CH<sub>4</sub> and N<sub>2</sub>O GHG factors based on Table C-2 of 40 CFR 98 Mandatory Greenhouse Gas Reporting.
- CO<sub>2</sub> emissions based on 40 CFR Part 75, Appendix G, Equation G-4  
 $W_{CO_2} = (F_c \times H \times U_f \times MW_{CO_2}) / 2000$   
 $W_{CO_2}$  = CO<sub>2</sub> emitted from combustion, tons/yr  
 $F_c$  = Carbon based F-factor, 1040 scf/MMBtu  
 $H$  = Heat Input (MMBtu/yr)  
 $MW_{CO_2}$  = Molecule weight of CO<sub>2</sub>, 44.0 lb/lbmole
- Global Warming Potential factors based on Table A-1 of 40 CFR 98 Mandatory Greenhouse Gas Reporting.
- Example calculation: GHG emissions (lbs) x Global Warming Potential / 1 MW = lb CO<sub>2</sub>e/MWhr