

CALIFORNIA ENERGY COMMISSION

1516 NINTH STREET
SACRAMENTO, CA 95814-5512**DOCKET****06-AFC-9C**DATE APR 08 2009RECD. APR 08 2009

DATE: April 8, 2009

TO: Interested Parties

FROM: Dale Rundquist, Compliance Project Manager

SUBJECT: Colusa Generating Station Project (06-AFC-9C)
Staff Analysis of Proposed Modifications to Amend the Colusa
Generating Station License.

On August 15, 2008, Pacific Gas and Electric Company filed a petition with the California Energy Commission to amend the Energy Commission Decision for the Colusa Generating Station Project. Staff prepared an analysis of this proposed change, and a copy is enclosed for your information and review.

The Colusa Generating Station Project is a 660 MW combined cycle power plant located 14 miles north of Williams and 4 miles west of I-5 in Colusa County, California. The project was certified by the Energy Commission on April 23, 2008, and is currently under construction.

The proposed modifications in the petition would revise the general equipment arrangement, eliminate the diesel emergency generator, replace the diesel fire pump with an electric fire pump, eliminate the auxiliary boiler, relocate the natural gas metering station, incorporate a natural gas water bath heater system and a wet surface air cooler.

Energy Commission staff reviewed the petition and assessed the impacts of this proposal on environmental quality, public health and safety, and proposes revisions to existing conditions of certification for Air Quality.

It is staff's opinion that, with the implementation of revised conditions, the project will remain in compliance with applicable laws, ordinances, regulations, and standards and that the proposed modifications will not result in a significant adverse direct or cumulative impact to the environment (Title 20, California Code of Regulations, Section 1769).

The amendment petition and staff's analysis has been posted on the Energy Commission's webpage at

<http://www.energy.ca.gov/sitingcases/colusa/compliance/index.html>

The Energy Commission's Order (if approved) will also be posted on the webpage. Energy Commission staff intends to recommend approval of the petition at the June 3, 2009 Business Meeting of the Energy Commission. If you have comments on this proposed modification, please submit them to me at the address below prior to April 23, 2009.

Dale Rundquist, Compliance Project Manager
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Comments may be submitted by fax to (916) 654-3882, or by e-mail to drundqui@energy.state.ca.us. If you have any questions, please contact me at (916) 651-2072.

Enclosure

AIR QUALITY

Testimony of William Walters, P.E.

INTRODUCTION

The Colusa Generating Station (CGS) project owner, Pacific Gas and Electric Company (PG&E) has proposed modifying various CGS project components. These proposed changes include adding and removing various auxiliary equipment items, changing the number and size of other equipment types, changing the general arrangement of the site, and reducing the permitted maximum hourly particulate matter (PM) emission rate for the gas turbine/heat recovery steam generator (HRSG). This amendment does not request changes to the basic technology or controls for the gas turbine/HRSGs or result in any significant changes in the power production potential for the facility.

This amendment has the potential to effect operating impacts due to changes in the auxiliary equipment emissions;

- to a significant reduction in requested gas turbine/heat recovery steam generator (HRSG) exhaust PM10 emission rates;
- the request to also reduce the PM10 emissions mitigation; and
- other changes to the offset mitigation package from that originally proposed and approved. Staff has evaluated these effects and is proposing revised and new conditions of certification to ensure the project will continue to have less than significant operating impacts.

The construction impacts should not be significantly impacted as the proposed additions and deletions of equipment/facilities should on the whole balance and not create significant emission increases that would affect the original construction significance determination.

LAWS, ORDINANCES, REGULATIONS AND STANDARDS (LORS) COMPLIANCE

Since the project was originally analyzed by staff in November 2007 (CEC 2007) there have been no changes to applicable LORS except changes to the federal and state ambient air quality standards. **AIR QUALITY Table 1** describes these changes and the project's compliance with these revised LORS.

AIR QUALITY Table 1
Laws, Ordinances, Regulations, and Standards (LORS)

<u>Applicable Law</u>	<u>Description</u>
Federal	
40 CFR Part 50	The Federal 8-hour ozone standard was reduced from 0.08 parts per million (ppm) to 0.075 ppm. The requirements related to this new standard will take several years to implement; however, Colusa County has been found to be unclassified/attainment for the federal 8-hour standard. Additionally, the project complies with current Colusa County Air Pollution Control District (CCAPCD) New Source Review regulations and will mitigate its operating Nitrogen Oxides (NOx) and Volatile Organic Compound (VOC) emissions using Emission Reduction Credits (ERCs) at a minimum ratio of

<u>Applicable Law</u>	<u>Description</u>
	1:1. Therefore, this project will not impact compliance with this new standard.
State	
17 CCR § 70200	The state 1-hour nitrogen dioxide (NO ₂) standard was revised from 0.25 ppm to 0.18 ppm, and a new annual standard of 0.03 ppm was approved. The amended project's construction activities will not cause an increase to any of the previously analyzed project construction impacts nor cause any new exceedances of these revised standards; and the amended project's removal of the auxiliary boiler and diesel fired emergency engines would decrease or not change the previously analyzed project operation impacts under all operating scenarios.
Local	
CCAPCD Rules	There have been no changes to applicable CCAPCD rules and regulations since the project was originally certified.

There have been no changes to LORS that would impact the original BACT or offset mitigation findings of the project. However, the applicant is requesting a reduced emission rate for PM₁₀ and the equipment changes will reduce emissions for all pollutants except for very minor increases in VOC and Sulfur dioxide (SO₂). Therefore, the offset mitigation requirements are recommended to be revised per the applicant's revised emission potential.

Additionally, the attainment status for the National Ambient Air Quality Standards (NAAQS) and California Ambient Air Quality Standards (CAAQS) has not changed since the original project analysis.

ANALYSIS

Staff has reviewed the petition for potential environmental effects and consistency with applicable LORS. Based on this review, staff determined that most of the revisions and changes to the project elements as outlined in the amendment request (PG&E 2008a) will not significantly impact air quality. The following amended project elements are not expected to increase air quality impacts or mitigation requirements:

- The minor equipment additions (wet surface air cooler and water bath heater) and deletions (auxiliary boiler and two emergency engines) generally cause a minor decrease in pollutant emissions and a minor decrease in normal operating impacts in comparison to those previously evaluated.
- The reduction in particulate emissions allowed from the gas turbine/HRSGs will reduce PM₁₀ and PM_{2.5} impacts in comparison to those previously evaluated.
- The reconfiguration of equipment, specifically the removal of the auxiliary boiler and addition of the wet surface air cooler (WSAC) do not impact the building downwash modeling impacts.

Those revisions that would have the potential to impact air quality impacts, if not addressed, are as follows:

- The revised CCAPCD required offset mitigation does not provide for a 1:1 offset ratio for Particulate Matter (PM) emissions; and the slightly revised annual emission rates also impact the value of SO₂ offsets necessary in staff condition **AQ-SC7**.

The construction, operation, cumulative, and greenhouse gas impacts are addressed separately below.

CONSTRUCTION IMPACT ANALYSIS

The requested revisions to the project include deletion of several pieces of auxiliary equipment (auxiliary boiler and two emergency engines), addition of auxiliary equipment (WSAC and natural gas water bath heater), and a revision to the general arrangement which also includes a reduction in equipment numbers (lubricating oil fin fan coolers) or size/design, such as changing the air cooled condenser from 45 cells to 42 cells. None of these revisions are major and would not significantly impact the construction emissions or related impacts. Therefore, staff has determined that these revisions will not impact compliance with LORS and will not increase construction air quality impacts above those already assessed or require additional construction mitigation measures beyond that those already required.

OPERATIONS IMPACT ANALYSIS

The requested changes to the auxiliary equipment would only marginally impact the total facility emissions, reducing emission potential slightly. A comparison of the emission from these auxiliary equipment changes, other than small increase of 0.24 lb/hour of PM emission from the WSAC, are shown in revised District conditions **AQ-23** and **AQ-24** shown later in this analysis. As these two conditions show, considering the WSAC emissions, the hourly emissions potential for the amended auxiliary equipment would decrease based on the proposed auxiliary equipment changes.

Other than the requested reduction in PM emission rate limits, there are no specific technology, control equipment, operating parameter, operating event (such as startup), or other emission rate changes requested for the gas turbine/HRSGs. The requested reduction in the gas turbine/HRSG PM emission rate will significantly reduce the overall permitted PM₁₀/PM_{2.5} emissions for the facility, where a comparison of the original and requested revised hourly PM₁₀ emissions are shown below in **Air Quality Table 2**.

AIR QUALITY Table 2
Particulate Emissions Comparison, Currently Permitted vs. Requested

Maximum Hourly Gas Turbine/HRSG PM10 Emissions (lbs/hour)			
Operating Mode	Current Permit Basis	Revised Permit Basis Request	Resulting Permit Emission Reduction
Non-Duct Firing	12.9	10	2.9
Duct Firing	20.1	13.5	6.6

Source: CEC 2007 and PG&E 2008a

The overall changes in the permitted emission rates for the facility are shown in the revised District conditions of certification **AQ-23** through **AQ-26**.

The project's short-term and long-term emission for pollutants assessed by direct air dispersion modeling impact analysis would not increase, with the exception of negligible increases in annual CO and SOx emissions that would not impact the modeling assessment results. Therefore, staffs original modeling analysis determination of no significant impacts after mitigation still applies to the project.

The District found that the new equipment complied with all District rules and regulations, such as BACT, and identified changes to the District required offsets. Therefore, staff concludes that the amended project would comply with LORS requirements.

Operations Mitigation Analysis

The project owner has proposed to reduce the PM10 emission mitigation consistent with the reduction in the permitted annual gas turbine/HRSG PM10 emission rate and to also accommodate the minor revisions in the facility annual permitted emission rates that result from the requested changes to the auxiliary equipment. Additionally, the project owner has specified the emission reduction credits planned to be used for each pollutant from among those on the original condition of certification **AQ-SC7 Appendix A** list, with their addition of one stationary source credit, the reduction in use of one of the stationary source credits (PM10 only), the addition of four agricultural burn cessation ERC credit sources, and the complete or partial reduction in use of 20 agriculture burn cessation ERC credit sources (PG&E 2009a, 2009b).

The newly proposed stationary source emission reduction credit was created in 2001 by an equipment replacement at the PG&E Gerber Compressor Station located in Gerber approximately 48 miles north northeast of the project site. The quantities of ERCs that are proposed to be used from this specific ERC certificate are not the entire quantities available on this ERC certificate, and proposed quantities for use are provided in the **AQ-SC7 Appendix A** list.

Staff has evaluated this new proposal and has found that the proposed emission reduction credits, after the application of appropriate distance and interpollutant offset ratios are sufficient to meet both District offset requirements and staff's recommended offset requirement of a minimum of a 1:1 offsets for all nonattainment pollutants and their precursors. Specific issues of concern to staff are the amount of NOx for NOx ERCs proposed and the amount of stationary source ERCs proposed. The latest applicant's offset proposal (PG&E 2009b) provides the same amount of NOx for NOx ERCs as originally proposed, so staff does not need to reevaluate the VOC for NOx interpollutant offset ratio basis. The proposal maintains or increases the amount of stationary source ERCs proposed for all pollutants except PM10. The applicant notes the four new agricultural burn cessation ERCs are located much closer to the project site than the Yuba County stationary source PM10 ERCs that are no longer being proposed. Staff accepts this rationale that the requested change in PM10 ERCs does not impact the net air quality benefit of the overall offset mitigation proposal as applied to this particular siting case.

The mathematical analysis of the offset proposal is provided below in **Air Quality Table 3**.

AIR QUALITY Table 3
Revised CGS Offset Proposal Analysis (lbs/year)

Pollutant	Annual Emissions Limit	ERCs	ERCs After Distance Ratio ^a	ERCs After VOC/NOx Transfer ^b	District Need ^c	CEQA Need ^d	Balance ^e
NOx	369,400	282,987.8	199,651.4	319,400	319,400	--	0
VOCs	95,080	350,000 ^f	233,333.3	98,527.9	^c	95,080	3,527.9 ^g
PM10	206,720	225,333.8	156,720.0	---	156,720	--	0
SO ₂	31,380	31,401.0	--	---	--	31,380	21

Source: PG&E 2009a, PG&E 2009b, and staff analysis.

a - Distance ratio is based on the location of each ERC and ranges from 1.2:1 to 2.0:1 depending on distance from ERC origination site and the permitted stationary source (CGS).

b - The interpollutant ratio VOC for NOx was established at 1.4:1 for the project. The NOx ERCs shown are with all ratios applied 1.2:1, and the remaining VOC ERCs shown without any distance or interpollutant ratio.

c - The District need is based on application of the distance and interpollutant ratios and is not the same basis as the values listed in condition of certification **AQ-27**. Additionally, the SO₂ need is actually based on staff's recommended minimum 1:1 offset requirement.

d - The CEQA need is based on 1:1 offset with no application of distance ratio as long as the ERC is within the same air basin. For VOC and SO₂ the CEQA need is greater than the District need.

e - The balance would be the amount of ERCs remaining, with distance ratio so unadjusted ERC values would be higher, after meeting all offset obligations.

f - This is only comprised of the VOC credits from the Hwy 70 Industrial Park stationary source reductions, where the project owner has indicated that they are going to retain all of the burn cessation VOC ERCs listed in **AQ-SC7 Appendix A**.

g - This value, which is shown without any distance or interpollutant ratio, is different than the project owner's value shown in their data responses as that analysis was based on the District requirements and did not show the additional VOC ERC requirements required to comply with staff condition **AQ-SC7**.

The specific emission reduction credits proposed for use by the project owner are provided in the revised staff condition **AQ-SC7 Appendix A** provided at the end of this staff assessment, where newly proposed ERCs are shown in underline and ERCs removed from the original approved offset package are shown in strikethrough. The project owner is proposing to surrender the stationary source VOC ERCs as necessary to complete the offset requirements, and will retain a portion of those stationary source VOC ERCs and all of the agricultural burn cessation VOC ERCs shown in the appendix as excess.

CUMULATIVE IMPACT ANALYSIS

The requested changes to the construction activities are comparatively minor in scope, include both minor new construction activities (WSAC construction) and reduced construction activities (removal of auxiliary boiler and emergency generator), and would not significantly increase overall project construction emissions, and would remain mitigated per staff and District conditions. Therefore, the revised construction activities would not change the finding of no significant cumulative impacts previously determined for this project.

The requested change in the auxiliary equipment and gas turbine/HRSG PM10 emission rates would result in either a reduction or no increase in total facility emissions under all operating scenarios; therefore, the changes in operation resulting from this amendment would not increase impacts, so staff's original finding of no significant cumulative impacts continues to apply to the project.

GREENHOUSE GAS IMPACT ANALYSIS

The requested changes to the auxiliary equipment would very slightly decrease the greenhouse gas (GHG) emissions from the project. Therefore, staff's original analysis and recommended requirement for GHG reporting (**AQ-SC8**) continue to apply for this project.

CONCLUSIONS AND RECOMMENDATIONS

The equipment additions and deletions are minor and would not increase air quality impacts for construction or operation. The conditions of certification for construction do not require revision for the minor overall change to the overall construction requirements and activities. New, revised, and deleted operating conditions are necessary to account for the requested changes to the auxiliary equipment. In addition to the District's revised conditions, staff is recommending revisions and additions to staff conditions as follows:

- A revision to condition **AQ-SC7** and its referenced Appendix A ERC list, accounting for the applicant's requested changes in the offset package and resulting revised District permit requirements (**AQ-27**), to maintain assurance that all nonattainment pollutants and their precursors will be mitigated at a minimum 1:1 ratio. Additionally, this condition has been revised to clarify the specific requirements of the ERC package originally found to be acceptable by staff, so that the requirements of any potential future revisions to the offset package are clear.
- The addition of two conditions of certification, **AQ-SC10** and **AQ-SC11**, for the wet surface air cooler, which was not required to have permit conditions by the District.

With the recommended revised and added conditions shown below staff has concluded the amended project will comply with all LORS and will not result in air quality impacts greater than those previously evaluated.

PROPOSED MODIFICATIONS TO CONDITIONS OF CERTIFICATION

The recommended modifications to staff and District conditions of certification are provided in underline and strikethrough.

STAFF CONDITIONS

Staff is recommends revising staff's ERC mitigation condition and adding two new conditions for the wet surface air cooler as shown below. Staff conditions not shown below are recommended to remain unchanged.

AQ-SC7 The project shall surrender the emission offset credits listed in Appendix A or a modified list, as allowed by this condition, at the time and in the quantities required by condition **AQ-27** and herein. The project owner may request CPM approval for any substitutions or modification of credits listed in Appendix A. The CPM, in consultation with the District, may approve any such change to the ERC list provided that the project remains in compliance with all applicable laws, ordinances, regulations, and standards; the requested change(s) clearly will not cause the project to result in a significant environmental impact; and each requested change is consistent with applicable federal and state laws and regulations. In addition to the offset requirements of stipulated in **AQ-27**, the applicant will provide sufficient VOC and SO₂ ERCs to mitigate the VOC and

SO₂ emissions on a 1:1 basis annually, ~~which will require the applicant to obtain 731.6 pounds of additional SO₂ ERCs prior to initiation of construction.~~

Revisions to the offset package that require review and approval by the CPM include revisions in the amount of stationary source ERCs that are stipulated to be surrendered, where as currently stipulated all stationary source ERCs for NO_x, PM10 and SO₂ as listed in Appendix A will be surrendered and all VOC ERCs needed to offset the project will come from the listed stationary source VOC ERCs. Additionally, any increase in the amount of VOC for NO_x interpollutant offsets must be approved with an updated interpollutant offset ratio analysis.

Verification: ~~The project owner shall provide a record of the required additional SO₂ ERC source(s) prior to initiation of construction.~~ The project owner shall submit to the CPM a list of the ERC certificates and quantities surrendered to the District within 30 days of their surrender. The project owner shall request any changes to the ERC certificates to be surrendered at least 60 days prior to their surrender date as required in condition **AQ-27**. If the CPM, in consultation with the District, approves a substitution or modification, the CPM shall file a statement of the approval with the commission docket and mail a copy of the statement to every person on the post-certification mailing list. The CPM shall maintain an updated list of approved ERCs for the project.

AQ-SC10 The wet surface air cooler shall have a mist eliminator with a manufacturer guaranteed mist reduction rate of 0.005% or less of the water recirculation rate.

Verification: The project owner shall provide the CPM a copy of the manufacturer guarantee for the mist eliminator 30 days prior to installation of the wet surface air cooler.

AQ-SC11 The wet surface air cooler spray water shall be tested for total dissolved solids and that data shall be used to determine and report the particulate matter emissions from the wet surface air cooler. The wet surface air cooler spray water shall be tested at least once annually during the anticipated summer operation peak period (July through September).

Verification: The project owner shall provide the water quality test results and the wet surface air cooler particulate (PM10/PM2.5) emissions estimates to the CPM as part of the fourth quarter's quarterly operational report (**AQ-SC9**).

DISTRICT CONDITIONS

Additionally, staff recommends adopting the revised Colusa County Air Pollution Control District's conditions of certification (COC 2009) as shown below. District conditions not shown below are recommended to remain unchanged.

AQ-8 Stack gas testing, using EPA, ARB, or other APCO approved methods shall be required on an annual basis for NO_x, VOC, and CO on the HRSG stacks ~~and the auxiliary boiler stack~~. The HRSG stacks ~~and the auxiliary boiler stack~~ shall also be tested for SO_x and PM10 emissions during the first year and if requested by the APCO, in subsequent years. The natural gas water bath heater ~~emergency generator and firewater pump engines~~ shall be tested for NO_x, SO_x, VOC, CO, and PM10 during the first year and thereafter only as requested by the APCO.

Verification: The results and field data collected during source tests shall be submitted to the CPM and the District within 60 days of testing.

AQ-10 The gas turbines, duct burners, and natural gas water bath heater~~auxiliary boiler~~ shall be fired exclusively on pipeline quality natural gas.

Verification: The project owner shall submit information on the quality and type of fuel used for the gas turbines, duct burners, and natural gas water bath heater~~auxiliary boiler~~ to the CPM and the APCO in the Quarterly Operation Reports (**AQ-22**).

AQ-12 The sulfur content limit in diesel fuel used in the construction equipment ~~and emergency generator and firewater pump engines~~ shall be no more than 15 ppm. ~~Emissions from the two stationary engines mentioned above shall not exceed Ringelmann 0.5 or 10 percent opacity for an aggregate of three minutes in a one-hour period.~~

Verification: The project owner shall compile and submit the required data on the sulfur content of the diesel fuel as required in staff condition AQ-SC5~~and emissions from the emergency generator and firewater pump engines~~ and submit the information to the CPM and the APCO in the Quarterly Operation Reports (**AQ-22**). ~~The project owner shall make the site available for inspection by representatives of the District, ARB, and the Energy Commission.~~

AQ-17 The ~~auxiliary boiler~~natural gas water bath heater shall have a low NOx burner and shall meet a NOx limit of 15-0 30.0 ppmvd @ 3% O₂ averaged over one hour.

Verification: The project owner shall submit to the CPM and APCO natural gas water bath heater~~auxiliary boiler~~ source test emissions data demonstrating compliance with this condition as required in condition **AQ-8** and shall provide confirmation of normal operations of the heater~~boiler~~ as part of the Quarterly Operation Reports (**AQ-22**).

AQ-23 The emissions from the natural gas water bath heater ~~emergency generator and firewater pump engines~~ shall not exceed the hourly limits established in the table below. ~~Total annual operating hours shall not exceed 50 per engine. Testing of these two engines shall not be allowed during gas turbine commissioning and facility startup operations. The generator and firewater pump engines must comply with the Tier rating emissions for their model years.~~

One-Hour Maximum Emissions (lbs)			
Source	Bath Heater	Generator	Fire Pump
NOx	<u>0.39</u>	13.88	1.98
CO	<u>0.79</u>	0.32	1.72
VOC	<u>0.03</u>	0.15	Incl. in NOx
PM10	<u>0.03</u>	0.09	0.10
SO ₂	<u>0.03</u>	0.01	<0.01

Verification: The project owner shall submit to the CPM and APCO for approval the natural gas water bath heater ~~emergency generator and firewater pump~~ selected manufacturer emissions data ~~and engines specifications~~ demonstrating compliance with this condition at least 30 days prior to installation. ~~The project owner shall provide 12-month rolling engine operating hours data to show compliance with the operating hours restriction limits in this condition as part of the Quarterly Operation Reports (AQ-22).~~

AQ-24 Deleted. The emission rates from the auxiliary boiler shall not exceed the hourly limits established in the table below. The boiler shall not operate more than 3,744 hours per year.

One-Hour Maximum Emissions (lbs)	
Source	Auxiliary Boiler
NO _x	0.79
CO	1.64
VOC	0.18
PM10	0.33
SO ₂	0.13

Verification: The project owner shall submit to the CPM and APCO for approval the auxiliary boiler selected manufacturer emissions data and specifications demonstrating compliance with this condition and condition **AQ-17** at least 30 days prior to installation. The project owner shall submit to the CPM and APCO auxiliary boiler source test emissions data required under condition **AQ-8** demonstrating compliance with the emission limits for the pollutants included in the source test.

AQ-25 The total emissions from the CTGs and HRSGs shall not exceed those established below for hourly and daily operations.

Maximum Emissions Both Turbines (lbs)		
Pollutant	1-Hour Emissions	24-Hour Emissions
NO _x	666.60	2,994.60
CO	967.00	7,659.00
VOC	55.40	630.60
PM10	27.0040.20	648.00964.80
SO ₂	14.80	355.20

Verification: The project owner shall submit to the CPM and APCO CTG and HRSG emissions data demonstrating compliance with this condition as part of the Quarterly Operation Reports (**AQ-22**).

AQ-26 The total emissions from the Colusa Power Plant shall not exceed the limits established below.

Quarterly and Annual Estimated Combustion Emissions from CGS Facility					
Pollutant	1 st Quarter Emissions (tons)	2 nd Quarter Emissions (tons)	3 rd Quarter Emissions (tons)	4 th Quarter Emissions (tons)	Annual Emissions (tons)
NO _x	45.5645.60	43.5843.62	51.3051.34	44.2744.31	184.70184.87
CO	54.2954.20	52.4952.40	107.15107.06	53.9553.86	267.89267.52
VOCs	12.3012.36	11.6311.69	11.8411.90	11.7611.82	47.5447.77
PM10	25.5435.29	25.7835.39	26.0235.70	26.0235.69	103.36142.08
SO ₂	4.074.05	3.853.83	3.893.87	3.893.87	15.6915.62

Verification: The project owner shall submit to the CPM and APCO plant emissions data demonstrating compliance with this condition as part of the Quarterly Operation Reports (**AQ-22**).

AQ-27 Offsets for the Colusa Generating Station power plant shall be in effect prior to operation of the facility and will not be less than the following amounts at any time. The offsets presented in the first table below do not reflect distance factors adjustments, and the 1.4:1 VOC:NOx interpollutant ratio, nor the 25 tons per year emission allowance. No less than 5.08 tons of PM10 ERCs per quarter shallAll ERCs for PM10 will be provided prior to start of construction activities to offset construction PM10 emissions.

Emission Offsets by Calendar Quarter (not adjusted)					
Pollutant in tons	Quarter 1	Quarter 2	Quarter 3	Quarter 4	Annual Tons
Oxides of nitrogen (NO ₂)	<u>36.79</u> <u>50.75</u>	<u>35.41</u> <u>47.04</u>	<u>31.36</u> <u>36.55</u>	<u>37.93</u> <u>53.80</u>	<u>141.49</u>
Volatile organic compounds (CH ₄)	<u>39.89</u> <u>42.36</u>	<u>39.89</u> <u>44.69</u>	<u>39.89</u> <u>44.90</u>	<u>39.89</u> <u>44.82</u>	<u>159.56</u>
Particulate Matter PM10	<u>30.43</u> <u>32.54</u>	<u>28.33</u> <u>30.75</u>	<u>22.15</u> <u>24.09</u>	<u>31.75</u> <u>34.74</u>	<u>112.66</u>
Oxides of sulfur (SO ₂)	<u>3.50</u>	<u>2.94</u>	<u>4.39</u>	<u>3.85</u>	

Emission Offsets by Calendar Quarter (adjusted for distance and interpollutant offset ratio)					
Pollutant in tons	Quarter 1	Quarter 2	Quarter 3	Quarter 4	Annual Tons
Oxides of nitrogen (NO ₂)	<u>26.20</u>	<u>47.01</u>	<u>36.55</u>	<u>53.80</u>	<u>99.83</u>
Volatile organic compounds (CH ₄)	<u>26.59</u>	<u>26.59</u>	<u>26.59</u>	<u>26.59</u>	<u>106.36</u>
Particulate Matter PM10	<u>21.22</u>	<u>19.73</u>	<u>15.21</u>	<u>22.20</u>	<u>78.36</u>

Verification: At least 30 prior to commencing construction, the project owner shall surrender PM10 ERC certificates in the amounts to offset the emissions shown above to the District and provide documentation of that surrender to the CPM and APCO. At least 60 days prior to commencing CTG first fire, the project owner shall surrender the remaining ERC certificates to offset the emissions in the amounts shown above and as required in Condition **AQ-SC7**, to the District and provide documentation of that surrender to the CPM and APCO.

AQ-28 The construction of the facility cannot commence until all construction permits, including the U.S. EPA PSD permit, are obtained. Specified, limited construction activities are allowed prior to issuance of the PSD permit as stated in the USEPA policy document dated December 18, 1978.

Verification: The project owner shall keep proof of the project's District air permit and Energy Commission certification including copies of all permit conditions and conditions of certification on site starting at the commencement of construction through the final decommissioning of the project. The project owner shall make the District's permit conditions and conditions of certification available at the project site to representatives of the District, ARB and the Energy Commission for inspection. The project owner shall provide a copy of the U.S. EPA PSD permit to the CPM once it is available.

REFERENCES

- CEC (California Energy Commission) 2007. Final Staff Assessment Colusa Generating Station (06-AFC-9). November 2007.
- CEC 2008. Final Commission Decision Colusa Generating Station (06-AFC-9). April 2008.
- COC (Colusa County Air Pollution Control District) 2009. Revised Authority to Construct Conditions. E-mailed from Les Fife, CCAPCD Consultant, to William Walters, Aspen Environmental Group. March 5, 2009.
- PG&E (Pacific Gas & Electric Company) 2008a. Colusa Generating Station (06-AFC-09) Amendment 1. Submitted August 2008.
- PG&E (Pacific Gas & Electric Company) 2008b. Colusa Generating Station (06-AFC-09) Data Response Set 1 (1-17). Submitted November 2008.
- PG&E (Pacific Gas & Electric Company) 2009a. Colusa Generating Station (06-AFC-09) Data Response Set 2 (18, 19). Submitted January 2009.
- PG&E (Pacific Gas & Electric Company) 2009b. Colusa Generating Station (06-AFC-09) Data Response Set 3 (20-24). Submitted February 2009.

APPENDIX A

Emissions Reduction Credits

**Condition of Certification AQ-SC7
Required Emission Reduction Credits ^a**

ERC Certificate Number and Number Reduction Source Location Distance from Project	Pollutant	Total Q1 (lb)	Total Q2 (lb)	Total Q3 (lb)	Total Q4 (lb)	Annual (lbs)
Stationary Source ERCs						
Highway 70 Industrial Park, LP // Oroville, CA // Butte County ^b (Cert. 08-05-36, 08-05-37, 08-05-39) > 20 < 50 miles	NOx	35,000.0	35,000.0	35,000.0	35,000.0	140,000.0
	VOC	87,500.0	87,500.0	87,500.0	87,500.0	350,000.0
	PM10	33,500.0	33,500.0	33,500.0	33,500.0	134,000.0
	SO ₂	0.0	0.0	0.0	0.0	0.0
PGE Credits/Gerber Compressor Station//Gerber, CA//Tehama County (Cert. 01-009) > 20 < 50 miles	NOx	15,995.9	15,995.9	15,995.9	15,995.9	63,983.6
	VOC	0.0	0.0	0.0	0.0	0.0
	PM10	352.2	352.2	352.2	352.2	1,408.8
	SO ₂	18.0	18.0	18.0	18.0	72.0
Jack W. Baber // Sierra Mountain Mills, Camptonville, CA // Yuba County ^c (Cert. ERC-9937006-00T) > 50 miles	NOx	420.0	707.0	641.0	501.0	2,269.0
	VOC	199.0	335.0	304.0	238.0	1,076.0
	PM10	6,034.0	10,156.0	9,218.0	7,201.0	32,609.0
	SO ₂	166.0	279.0	254.0	198.0	897.0
Agricultural Burn Cessation ERCs						
Baber Family Trust // Colusa, CA // Colusa County ^d (Cert. 06-01-02-03) < 20 miles	NOx	1,004.8	810.3	324.1	1,102.0	3,241.2
	VOC	908.1	732.4	292.9	996.0	2,929.4
	PM10	1,217.3	981.7	392.7	1,335.1	3,926.8
	SO ₂	212.5	171.4	68.6	233.1	685.6
Jack W. Baber and Judith S. Baber // Colusa, CA // Colusa County ^d (Cert. 06-01-02-04) < 20 miles	NOx	2,401.8	1,936.9	774.8	2,634.2	7,747.7
	VOC	2,170.8	1,750.7	700.3	2,380.9	7,002.7
	PM10	2,909.8	2,346.6	938.7	3,191.4	9,386.5
	SO ₂	508.1	409.7	163.9	557.2	1,638.9
Estate of Jack W. Baber Jr. // Colusa, CA // Colusa County ^d (Cert. 06-01-02-05) < 20 miles	NOx	848.5	684.3	273.7	930.7	2,737.2
	VOC	767.0	618.5	247.4	841.2	2,474.1
	PM10	1,028.0	829.1	331.6	1,127.5	3,316.2
	SO ₂	179.5	144.8	57.9	196.9	579.1
Pixie E. Baber // Colusa, CA // Colusa County ^d (Cert. 06-01-02-05.2) < 20 miles	NOx	809.0	625.5	261.0	887.3	2,582.8
	VOC	731.2	589.7	235.9	802.0	2,358.8
	PM10	980.2	790.5	316.2	1,075.0	3,161.9
	SO ₂	171.1	138.0	55.2	187.7	552.0
Jack W. Baber and Judith S. Baber // Colusa, CA // Colusa County ^d (Cert. 06-01-02-06) < 20 miles	NOx	587.8	474.1	189.6	644.7	1,896.2
	VOC	531.3	428.5	171.4	582.7	1,713.9
	PM10	712.2	574.3	229.7	781.1	2,297.3
	SO ₂	124.3	100.3	40.1	136.4	401.1

ERC Certificate Number and Number Reduction Source Location Distance from Project	Pollutant	Total Q1 (lb)	Total Q2 (lb)	Total Q3 (lb)	Total Q4 (lb)	Annual (lbs)
Inez Garrette // Colusa, CA // Colusa County^d (Cert. 06-01-02-07) < 20 miles	NO _x	195.9	158.0	63.2	214.9	632.0
	VOC	177.1	142.8	57.1	194.2	571.2
	PM10	237.4	191.4	76.6	260.4	765.8
	SO ₂	41.4	33.4	13.4	45.5	133.7
Jack W. Baber and Judith S. Baber // Colusa, CA // Colusa County^d (Cert. 06-01-02-08) < 20 miles	NO _x	2,083.5	1,680.2	672.1	2,285.1	6,720.9
	VOC	1,883.1	1,518.7	607.5	2,065.4	6,074.7
	PM10	2,524.2	2,035.6	814.3	2,768.5	8,142.6
	SO ₂	440.7	355.4	142.2	483.4	1,421.7
Jack W. Baber Jr. // Colusa, CA // Colusa County^d (Cert. 06-01-02-09) < 20 miles	NO _x	1,577.2	1,271.9	508.8	1,729.8	5,087.7
	VOC	1,425.5	1,149.6	459.9	1,563.5	4,598.5
	PM10	1,910.8	1,541.0	616.4	2,095.7	6,163.9
	SO ₂	333.6	269.1	107.6	365.9	1,076.2
Davis Ranches // Colusa, CA // Colusa County^d (Cert. 06-7-2001-1) > 20 miles < 50 miles	NO _x	13,034.2	10,511.5	4,204.6	14,295.6	42,045.9
	VOC	11,780.9	9,500.7	3,800.3	12,921.0	38,002.9
	PM10	15,791.4	12,735.0	5,094.0	17,319.6	50,940.0
	SO ₂	2,752.2	2,223.6	889.4	3,024.1	8,889.3
Gunnersfield Ent., Inc. // Maxwell, CA // Colusa County^d (Cert. 06-01-02-02) < 20 miles	NO _x	5,616.0	4,529.0	1,811.6	6,159.4	18,116.0
	VOC	5,076.0	4,093.5	1,637.4	5,567.2	16,374.1
	PM10	6,803.9	5,487.0	2,194.8	7,462.4	21,948.1
	SO ₂	1,188.0	958.1	383.2	1,303.0	3,832.3
Jon B. Chaney // Maxwell, CA // Colusa County^d (Cert. 06-01-02-01) < 20 miles	NO _x	2,104.1	1,696.9	678.5	2,307.8	6,787.3
	VOC	1,901.8	1,533.7	613.5	2,085.9	6,134.9
	PM10	2,549.3	2,055.8	822.3	2,796.0	8,223.4
	SO ₂	445.1	359.0	143.6	488.2	1,435.9
Jack DeWit // Maxwell, CA // Colusa County^d (Cert. 06-07-02-05) < 20 miles	NO _x	1,143.0	921.8	368.7	1,253.7	3,687.2
	VOC	1,033.1	833.2	333.3	1,133.1	3,332.7
	PM10	1,384.8	1,116.8	446.7	1,518.8	4,467.1
	SO ₂	241.8	195.0	78.0	265.2	780.0
Jerry Maltby et. al. // Williams, CA // Colusa County^d (Cert. 06-06-11-01) < 20 miles	NO _x	4,522.5	3,647.2	1,458.9	4,960.2	14,588.8
	VOC	4,087.7	3,296.5	1,318.6	4,483.3	13,186.1
	PM10	5,479.2	4,418.7	1,767.5	6,009.5	17,674.9
	SO ₂	956.7	771.5	308.6	1,049.3	3,086.1
Keeley Family Limited Partnership // Colusa, CA // Colusa County^d (Cert. 06-07-06-01) < 20 miles	NO _x	1,685.2	1,359.0	543.6	1,848.2	5,436.0
	VOC	1,523.1	1,228.3	491.3	1,670.5	4,913.3
	PM10	2,041.6	1,646.5	658.6	2,239.2	6,585.9
	SO ₂	356.5	287.5	115.0	391.0	1,149.9
Jim Lagrande // Colusa, CA // Colusa County^e (Cert. 06-01-03-01) < 20 miles	NO _x	1,315.0	1,118.2	567.0	1,448.9	4,449.1
	VOC	1,192.2	1,110.7	634.7	1,312.5	4,250.1
	PM10	1,598.0	1,496.9	864.4	1,758.3	5,717.6
	SO ₂	279.0	242.7	119.6	305.5	946.8
Charles Tuttle, Gordon Ranch // Maxwell, CA // Colusa County^e (Cert. 06-07-02-01) < 20 miles	NO _x	1,592.3	1,448.5	789.1	1,750.8	5,580.7
	VOC	1,439.2	1,451.0	951.0	1,586.3	5,427.5
	PM10	1,929.2	1,960.9	1,301.1	2,126.8	7,318.0
	SO ₂	336.8	306.0	166.3	370.3	1,179.5
Charles Tuttle, Tenant Ranch //	NO _x	1.6	118.8	352.8	3.2	476.4

ERC Certificate Number and Number Reduction Source Location Distance from Project	Pollutant	Total Q1 (lb)	Total Q2 (lb)	Total Q3 (lb)	Total Q4 (lb)	Annual (lbs)
Maxwell, CA // Colusa County ^f (Cert. 06-07-02-03) < 20 miles	VOC	5.1	210.0	857.5	5.7	1,078.3
	PM10	5.1	292.9	1,095.4	7.9	1,401.3
	SO ₂	0.2	24.9	62.2	0.7	88.0
Charles Tuttle, Helphenstine Ranch // Maxwell, CA // Colusa County ^g (Cert. 06-07-02-02) < 20 miles	NO _x	0.0	85.8	143.8	2.3	232.0
	VOC	0.0	151.7	254.2	4.1	410.0
	PM10	0.0	211.6	354.5	5.7	571.8
Charles Tuttle, Williams Ranch // Maxwell, CA // Colusa County ^g (Cert. 06-07-02-04) < 20 miles	NO _x	0.0	60.9	102.1	1.6	164.7
	VOC	0.0	107.7	180.4	2.9	291.0
	PM10	0.0	150.2	251.7	4.1	405.9
William Payne // Woodland, CA // Sutter County ^d (Cert. ERC 2001-26) > 20 miles < 50 miles	NO _x	1,701.0	1,874.0	3,033.0	1,901.0	8,509.0
	VOC	1,538.0	2,362.0	8,034.0	1,718.0	13,652.0
	PM10	2,061.0	3,240.0	9,931.0	2,303.0	17,535.0
Emerald Farms Colusa County ^g (Cert. 06-01-08-01) < 20 miles	NO _x	3,274.7	2,981.1	1,626.4	3,600.9	11,483.1
	VOC	2,959.9	2,988.2	1,962.3	3,262.5	11,172.9
	PM10	3,967.5	4,038.2	2,685.0	4,374.1	15,064.8
	SO ₂	692.7	629.9	342.8	761.7	2,427.1
Emerald Farms Colusa County ^d (Cert. 06-01-08-02) < 20 miles	NO _x	465.9	375.7	150.3	510.9	1,502.8
	VOC	421.1	339.6	195.8	461.8	1,418.3
	PM10	564.4	455.2	182.1	619.0	1,820.7
	SO ₂	98.5	79.5	31.8	108.1	317.9
Emerald Farms Colusa County ^d (Cert. 06-01-08-03) < 20 miles	NO _x	4,136.6	3,338.0	1,334.4	4,536.9	13,345.9
	VOC	3,738.9	3,015.2	1,208.1	4,100.7	12,062.9
	PM10	5,011.7	4,041.7	1,616.7	5,498.7	16,168.8
	SO ₂	875.1	705.7	282.3	959.7	2,822.8
Emerald Farms Colusa County ^g (Cert. 06-01-08-04) < 20 miles	NO _x	576.1	542.2	315.9	634.0	2,068.2
	VOC	520.7	557.1	397.9	574.8	2,050.5
	PM10	698.0	754.3	545.8	770.7	2,768.8
	SO ₂	121.9	114.5	66.5	134.1	437.0

Source: E&LW, 2006d and PG&E 2009.

^a The quantities listed are the certificate totals for each pollutant owned or proposed to be used by the project owner. The total quantity required for offsetting may be less than the total for each pollutant shown above, and those remaining credits can be retained by the project owner applicant at their discretion after surrendering the amounts required as shown in Conditions of Certification AQ-27 and AQ-SC7.

^b These emission reductions were the result of the permanent shutdown of the Louisiana Pacific fiberboard production plant and associated emission sources (hardboard production line, two boilers, etc.) in Oroville.

^c These emission reductions were the result of the permanent shutdown of two wood-fired boilers at Sierra Mountain Mills.

^d Agricultural burn cessation crop is rice for these sources.

^e Agricultural burn cessation crop is rice and wheat for these sources.

^f Agricultural burn cessation crop is safflower and wheat for this source.

^g Agricultural burn cessation crop is wheat for these sources.