

Marsh Landing Generating Station  
Plant No. 19169  
Application No. 18404  
Index of Footnotes for Preliminary Determination of Compliance (March, 2010)

Footnote Number	Reference	Electronic Copy
1	California Energy Commission, Final Commission Decision, Avenal Energy, Application for Certification (08-AFC-01), Kings County (Dec. 16, 2009) p. 112, Finding of Fact no. 23 (available at: <a href="http://www.energy.ca.gov/2009publications/CEC-800-2009-006/CEC-800-2009-006-CMF.PDF">www.energy.ca.gov/2009publications/CEC-800-2009-006/CEC-800-2009-006-CMF.PDF</a> ).	See CEC Website
2	Mirant Delta, LLC, has agreed to include the following enforceable permit condition in its air permits: "Subject to: (i) receipt of final, non-appealable California Public Utilities Commission approval of the Tolling Agreement for Units 6 and 7 at the Contra Costa Power Plant by and between Mirant Delta, LLC and Pacific Gas and Electric Company and dated as of September 2, 2009, as amended from time to time, without material condition or modification unacceptable to either party thereto in its sole discretion; and (ii) the receipt of all other approvals and consents from the relevant local, state and federal governmental agencies (including but not limited to the California Independent System Operator) necessary for the shutdown and permanent retirement from service of Units 6 and 7; Mirant Delta, LLC will shut down and permanently retire Units 6 and 7 from service at 2400 PDT on April 30, 2013." Mirant Delta, LLC, has agreed that prior to the Air District's issuance of the FDOC for the Marsh Landing facility, Mirant Delta will submit an application for an amendment to its Air District permit to incorporate the foregoing permit condition.	NA
3	See AP-42, Table 1.4-2, footnote c, 7/98 (available at <a href="http://www.epa.gov/ttnchie1/ap42/ch01/final/c01s04.pdf">www.epa.gov/ttnchie1/ap42/ch01/final/c01s04.pdf</a> ).	See EPA Website
4	NOx can also be formed when a nitrogen-bound hydrocarbon fuel is combusted, resulting in the release of nitrogen atoms from the fuel (fuel NOx) and NOx can be formed by organic free radicals and nitrogen in the earliest stages of combustion (prompt NOx). Natural gas does not contain significant amounts of fuel-bound nitrogen, therefore thermal NOx is the primary formation mechanism for natural gas fired gas turbines. References to NOx formation during combustion in this analysis refer to "thermal NOx", NOx formed from nitrogen in the combustion air.	NA
5	M. Schorr, J. Chalfin, GE Power Systems, "Gas Turbine NOx Emissions Approaching Zero - Is it Worth the Price?", 9/99, pg. 1.	See ger4172.pdf
6	J. Kovac, "Advanced SGT6-5000F Development", Power-Gen International 2008-Orlando, Florida, Siemens Energy Inc., See pg 8	See PowerGen2008_SGT65000F.pdf
7	NSCR discussion is from Institute of Clean Air Companies website: <a href="http://www.icac.com/i4a/pages/index.cfm?pageID=3399">www.icac.com/i4a/pages/index.cfm?pageID=3399</a>	See Clean Air Companies website
8	See BAAQMD, Draft Report, Fine Particulate Matter Data Analysis and Modeling in the Bay Area (Draft, Oct. 1, 2009), at p. 8 (Draft PM2.5 Modeling Report). The Air District anticipates issuing a final report in the near future.	See PM-data-analysis-and-modeling-report_DRAFT.pdf
9	Draft PM2.5 Modeling Report at p. E-3 & p. 30.	See PM-data-analysis-and-modeling-report_DRAFT.pdf
10	Draft PM2.5 Modeling Report at pp. E-3 - E-4.	See PM-data-analysis-and-modeling-report_DRAFT.pdf
11	Draft PM2.5 Modeling Report at p. 30.	See PM-data-analysis-and-modeling-report_DRAFT.pdf
12	Draft PM2.5 Modeling Report, Figure 17, p. 31.	See PM-data-analysis-and-modeling-report_DRAFT.pdf
13	Draft PM2.5 Modeling Report at p. 10.	See PM-data-analysis-and-modeling-report_DRAFT.pdf
14	Attachment in an email dated 9/8/08 from Jeff Valmus of Emerachem to Weyman Lee BAAQMD. Please see pdf file, EMx BACT economic analysis (final)-09072008.pdf.	See EMx BACT economic analysis (final)-09072008.pdf
15	Letter from R. Bell, Air Quality District Manager, Shasta County Air Quality Management District, to R. Bennett, Safety & Environmental Coordinator, Redding Electric Utility, June 23, 2005.	See EMx Redding 2005 Letter.pdf

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16	BASF, High Temperature SCR for simple-cycle gas turbine applications, 2007	See BF-8642_High_Temperature_SCR[1].pdf
17	BASF, NOxCatā VNX SCR Catalyst for natural gas turbines and stationary engines, 2009.	See BF-6337-030609[1].pdf
18	Please see the BASF Quote supplied by URS Corporation dated May 29, 2009. Quote is for combined-cycle turbines and indicates CO may be controlled to below 2 ppm for catalyst bed size or 0.9 ppm for another bed size. District believes that the 2.0 ppm level of control may be technically feasible for simple-cycle gas turbines. It is not known if 0.9 ppm level of control is possible for simple-cycle gas turbines (back pressure issues are possible). See discussion of whether 0.9 ppm limit would be cost effective in the Section below.	See URS-STREHLOW-FLEX-10-BASF-052909-CO-R0.PDF
19	Please see the BASF Quote supplied by URS Corporation dated May 29, 2009.	See URS-STREHLOW-FLEX-10-BASF-052909-CO-R0.PDF
20	See Spreadsheet, CO Incremental 031610 BASF, prepared by Brian Lusher BAAQMD.	See CO Incremental 031610 BASF.pdf
21	See Spreadsheet, CO Average 031610 BASF, prepared by Brian Lusher, BAAQMD.	See CO Average 031610 BASF.pdf
22	Bay Area Air Quality Management District Best Available Control Technology (BACT) Guideline, § 1, Policy and Implementation Procedure, available at: <a href="http://www.baaqmd.gov/pmt/bactworkbook/default.htm">www.baaqmd.gov/pmt/bactworkbook/default.htm</a> .	See District website
23	Cf. South Coast Air Quality Management District, Best Available Control Technology Guidelines, August 17, 2000, revised July 14, 2006, at 29; available at: <a href="http://www.aqmd.gov/bact/BACTGuidelines2006-7-14.pdf">www.aqmd.gov/bact/BACTGuidelines2006-7-14.pdf</a> ; Memorandum, David Warner, Director of Permit Services, to Permit Services Staff, Subject: "Revised BACT Cost Effectiveness Thresholds", May 14, 2008; available at: <a href="http://www.valleyair.org/busind/pto/bact/May%202008%20updates%20to%20BACT%20cost%20effectiveness%20thresholds.pdf">www.valleyair.org/busind/pto/bact/May%202008%20updates%20to%20BACT%20cost%20effectiveness%20thresholds.pdf</a> .	See SCAQMD and SJVAPCD websites
24	This facility is subject to BACT requirements for PM10 only. PM2.5, a subset of PM10, is regulated under federal requirements in 40 C.F.R. Section 52.21 (PSD) and 40 C.F.R. Part 51, Appendix S (Non-Attainment NSR). The facility is not subject to PSD or PM2.5 Non-Attainment NSR permit requirements under Section 52.21 or Appendix S because the facility is not a "major facility" for the purposes of these regulations. The District is therefore not conducting a PSD permitting analysis or an Appendix S permitting analysis for PM2.5. For a detailed discussion of the applicability of these federal requirements for PM2.5, see Section 7 below. The District notes, however, that for combustion turbines essentially all of the PM emissions are less than one micron in diameter, so it is both PM10 and PM2.5. (See AP-42, Table 1.4-2, footnote c, 7/98 (available at <a href="http://www.epa.gov/ttnchie1/ap42/ch01/final/c01s04.pdf">www.epa.gov/ttnchie1/ap42/ch01/final/c01s04.pdf</a> ). Moreover, the same emissions control technologies that will be effective for PM10 for this facility will also be similarly effective for PM2.5. The District's BACT analysis and emissions limit for PM10 will also therefore effectively be a BACT limit on PM2.5 emissions as well, even though the facility is not subject to the federal PM2.5 BACT requireme	NA
25	For example, if a baghouse were installed on the turbines, the turbine exhaust at the inlet to the baghouse would contain less PM than is normally seen in baghouse output, after abatement. PM emissions from a baghouse are normally in the range 0.0013 to 0.01 grains per standard cubic foot (see BAAQMD BACT/TBACT Workbook, Section 11: Miscellaneous Sources), whereas PM emissions from the proposed Marsh Landing turbines would be 0.00092 gr/dscf (@ 15% O2).	See District website
26	The 1.0 grain per 100 scf PUC standard is the maximum sulfur content of the gas at any point in time. The actual average content is expected to be less than 0.25 grains per 100 scf. The District has based its calculations of annual emissions on this 0.25 grain per 100 scf average sulfur content. Note that a portion of the sulfur contained in natural gas is intentionally added as an odorant to allow for the detection of leaks which would be a safety concern.	NA
27	Guidance for Power Plant Siting and Best Available Control Technology, California Air Resources Board, Stationary Source Division, September 1999, pg. 34.	See guidocfi.pdf
28	Please see file, Ren Power stack test.pdf. File contains letter to Ms. April Lazzaro of Michigan DEQ dated February 7, 2008 from Renaissance Power, LLC regarding 2007 stack testing results.	See Ren Power stack test.pdf
29	See Russell City Energy Center PSD Permit (2/4/2010) Condition Part 19(h) available at: <a href="http://www.baaqmd.gov/Home/Divisions/Engineering/Public%20Notices%20on%20Permits/2010/020410%2015487/Russell%20City%20Energy%20">www.baaqmd.gov/Home/Divisions/Engineering/Public%20Notices%20on%20Permits/2010/020410%2015487/Russell%20City%20Energy%20</a>	See B3161_nsr_15487_psd-permit_020410.pdf
30	Memorandum from Applicant to the District dated February 3, 2010, Subject: Revised Analysis of Expected Sulfate Formation at MLGS (See PM White Paper for BAAQMD 020310).	See PM White Paper for BAAQMD 020310.pdf

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31	Note that emission rates of particulate matter and sulfur oxides are not affected by startups and shutdowns and will be the same as for full load operation as during startup and shutdown periods (9 lb/hour for particulate matter, 6.21 lb/hour for SOx maximum, 1.55 lb/hour SOx annual average)	NA
32	The lack of additional control technologies for simple-cycle turbines is different than with combined-cycle turbines. For combined-cycle turbines, there have been several technological advances that have recently been developed, or are currently under development, that will allow those types of turbines to start up more quickly and with fewer emissions. These include startup procedures that heat up the additional steam-generating equipment used in combined-cycle turbines more quickly, allowing them to reach their optimal operating temperature more quickly; and advances that reduce emissions at lower loads where combined-cycle turbines must operate for extended periods while waiting for the equipment to heat up. These types of advances are not applicable to simple-cycle turbines. Simple-cycle turbines do not have any additional steam generating equipment that needs to be warmed up; and they ramp up very quickly to full load at rates as high as 30 MW per minute and do not spend any significant time operating at lower loads during startups.	NA
33	See Appendix D Siemens Emission Estimates.	NA
34	See Appendix D Siemens Emission Estimates.	NA
35	Word Attachment (Reply to BAAQMD as amended2.doc) to Email from Mark Strehlow of URS to Brian Lusher of BAAQMD dated 10/13/09.	101309 Email from Strehlow to Lusher.pdf
36	See Appendix D Siemens Emission Estimates.	NA
37	See 40 C.F.R. § 52.21(b)(1)(i)(b). Note that for 28 specific types of sources, a lower PSD applicability threshold of 100 tons applies pursuant to 40 C.F.R. § 52.21(b)(1)(i)(a). Simple-cycle combustion turbines of the type proposed for the Marsh Landing Generating Station are not in any of the categories subject to the 100 ton threshold specified in Section 52.21(b)(1)(i)(a).	NA
38	The District also has incorporated PSD requirements from the federal PSD regulations into its NSR Rule in Regulation 2, Rule 2. The substance of these requirements in Regulation 2, Rule 2 track the federal requirements.	NA
39	The Contra Costa Power Plant is a "major source" because it was built before current regulatory requirements were adopted and, as a result, has no annual emission limits. The facility's actual emissions have been well below the "major source" thresholds set forth in Section 52.21(b)(1). See Letter dated November 3rd, 2009 from David Farabee of Pillsbury Winthrop Shaw Pittman LLP to Allan Zabel, Senior Counsel, Office of Regional Counsel, U.S. EPA Region IX, and to Alexander Crockett, Assistant Counsel, Bay Area Air Quality Management District, attachment 2.	See Marsh Landing PSD 11-3-09.pdf
40	See 40 C.F.R. § 52.21(b)(2) (defining "major modification").	NA
41	The District has a substantively identical definition of "facility" in its District regulation 2-2-215	NA
42	Mirant Delta, LLC, has agreed to include the following enforceable permit condition in its air permits: "Subject to: (i) receipt of final, non-appealable California Public Utilities Commission approval of the Tolling Agreement for Units 6 and 7 at the Contra Costa Power Plant by and between Mirant Delta, LLC and Pacific Gas and Electric Company and dated as of September 2, 2009, as amended from time to time, without material condition or modification unacceptable to either party thereto in its sole discretion; and (ii) the receipt of all other approvals and consents from the relevant local, state and federal governmental agencies (including but not limited to the California Independent System Operator) necessary for the shutdown and permanent retirement from service of Units 6 and 7; Mirant Delta, LLC will shut down and permanently retire Units 6 and 7 from service at 2400 PDT on April 30, 2013." Mirant Delta, LLC, has agreed that prior to the Air District's issuance of the FDOC for the Marsh Landing facility, Mirant Delta will submit an application for an amendment to its Air District permit to incorporate the foregoing permit condition.	NA
43	See Letter dated January 8th, 2010 from Gerardo C. Rios of U.S. EPA Region IX to Brian Bateman of Bay Area Air Quality Management District. EPA Region 9 sent this letter to the District in response to a request by Mirant for review of the ownership situation of these two facilities and concurrence by EPA Region 9 that they should be treated as separate "facilities" for purposes of the PSD applicability requirements. See Letter from D. Farabee, Pillsbury Winthrop Shaw Pittman LLP, to A. Zabel, EPA Region 9, and A. Crockett, BAAQMD, Nov. 3, 2009. That letter included a White Paper outlining various EPA precedents interpreting the definition of "facility". The District incorporates that analysis of EPA's precedents, as well as EPA's concurrence with Mirant's approach for this specific facility, in this PDOC analysis.	See EPA Marsh Landing Letter to BAAQMD.pdf

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44	See Letter dated November 3rd, 2009 from David Farabee of Pillsbury Winthrop Shaw Pittman LLP to Allan Zabel, Senior Counsel, Office of Regional Counsel, U.S. EPA Region IX, and to Alexander Crockett, Assistant Counsel, Bay Area Air Quality Management District, attachment 2.	See Marsh Landing PSD 11-3-09.pdf
45	EPA promulgated National Ambient Air Quality Standards (NAAQS) for PM <sub>2.5</sub> in 1997 (with an update in 2006), and began designating certain regions of the country as non-attainment with those Standards starting in 2005. EPA made a determination as to the region's attainment status with respect to PM <sub>2.5</sub> , which it published on November 13, 2009. EPA determined that the Bay Area is in attainment of the PM <sub>2.5</sub> NAAQS for the annual standard, and is non-attainment for the 24-hour standard. The EPA's non-attainment determination for the PM <sub>2.5</sub> 24-hour standard became effective on December 14, 2009 (See Federal Register Friday November 13, 2009, Air Quality Designations for the 2006 24-Hour Fine Particle (PM <sub>2.5</sub> ) National Ambient Air Quality Standards).	NA
46	Letter dated 10/28/09 from Jack Broadbent of BAAQMD to Deborah Jordan U.S. EPA Region IX, Re: Guidance on "Appendix S" Non-Attainment NSR Permitting for PM <sub>2.5</sub> Source During PM <sub>2.5</sub> Transition Period.	See Jack Broadbent ltr dated 10-28-09 re-Guidance.pdf
47	Letter dated 12/9/09 from Deborah Jordan U.S. EPA Region IX to Jack Broadbent of BAAQMD, Re: Guidance on "Appendix S" Non-Attainment NSR Permitting for PM <sub>2.5</sub> Source During PM <sub>2.5</sub> Transition Period.	See Jack Broadbent ltr dated 12-9-09 Re-Guidance on Appenix S-.pdf
48	The facility will emit less than 100 tons per year of direct PM <sub>2.5</sub> emissions and less than 100 tons per year of any PM <sub>2.5</sub> precursors, as defined in Appendix S II.A.31(iii). (See Preliminary Determination of Compliance, Table 5).	NA
49	See email dated 2/22/10 from John Lague of URS to Brian Lusher of BAAQMD ( 022210 Email from Lague to Lusher.pdf).	See 022210 Email from Lague to Lusher.pdf
50	Letter dated February 22, 2010 from Lisa Jackson to Senator Rockefeller, Letter summarizes EPA proposals on regulating green house gases.	See LPJ_letter.pdf