DOCKETED

Docket Number:	12-AFC-02C
Project Title:	Huntington Beach Energy Project - Compliance
TN #:	206858
Document Title:	Data Responses, Set 1 (Responses to Data Requests 1-74)
Description:	N/A
Filer:	Cindy Salazar
Organization:	CH2M HILL
Submitter Role:	Applicant Consultant
Submission Date:	12/7/2015 9:26:35 AM
Docketed Date:	12/7/2015

Huntington Beach Energy Project

(12-AFC-02C)

Data Responses, Set 1

(Response to Data Requests 1 to 74)

Submitted to

California Energy Commission

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December 4, 2015

Contents

Introduction

Attached are AES Southland Development, LLC's (AES or the Project Owner) responses to the California Energy Commission (CEC) Data Request, Set 1 (numbers 1 through 74) regarding the Huntington Beach Energy Project (HBEP) (12-AFC-02) Petition to Amend (PTA).

The responses are grouped by individual discipline or topic area. Within each discipline area, the responses are presented in the same order as the CEC presented them and are keyed to the Data Request numbers (1 through 74). What was noted as Data Request number 8 is part of the background discussion provided by CEC staff and is therefore not actually a Data Request.

New or revised graphics or tables are numbered in reference to the Data Request number. For example, the first table used in response to Data Request 36 would be numbered Table DR36-1. The first figure used in response to Data Request 42 would be Figure DR42-1, and so on. Figures or tables from the HBEP PTA that have been revised have "R1" following the original number, indicating revision 1.

Additional tables, figures, or documents submitted in response to a data request (for example, correspondence, supporting data, stand-alone documents such as plans, folding graphics, etc.) are found at the end of each discipline-specific section and are not sequentially page-numbered consistently with the remainder of the document, though they may have their own internal page numbering system.

Air Quality (1–27)

AIR QUALITY DISTRICT APPLICATION

BACKGROUND

The Amended Huntington Beach Energy Project (HBEP) will require a Preliminary Determination of Compliance and a Final Determination of Compliance from the South Coast Air Quality Management District (SCAQMD or "District"). These documents contain conditions and limits that will be integrated into the staff analysis. Therefore, staff will need copies of all correspondence between the applicant and the District in a timely manner in order to stay up to date on any issues that arise prior to completion of the Preliminary or Final Staff assessment.

DATA REQUEST

A1. Please provide copies of all substantive District correspondence regarding the application to the District, including e-mails, within one week of submittal or receipt. This request is in effect until the amended final Commission Decision has been docketed.

Response: Attachment A1-1 presents all substantive correspondence between the Project Owner and the South Coast Air Quality Management District (SCAQMD) that has not been docketed. Subsequent substantive correspondence will be docketed within one week of submittal or receipt.

CONSTRUCTION AND OPERATION EMISSION CALCULATIONS

BACKGROUND

The Petition to Amend (PTA) Appendix 5.1A (Demolition and Construction Emission Estimates) and 5.1B (Commissioning and Operational Emission Estimates) are used to document emissions calculations. Staff needs the original spreadsheet files of these estimates with live, embedded formulas to complete their review. The hard copy of the PTA did not include Appendix 5.1A. Staff would like to have a hard copy of Appendix 5.1A on 11 by 17 inch paper so that staff and others can read the numbers.

DATA REQUESTS

A2. Please provide the spreadsheet versions of Appendix 5.1A and 5.1B worksheets with the embedded formulas live and intact.

Response: The spreadsheet versions of Appendix 5.1A and 5.1B are included with this submission on compact disc.

A3. Please provide a hard copy of Appendix 5.1A on 11 by 17 inch paper.

Response: A hard copy of Appendix 5.1A on 11-by-17-inch paper will be provided under separate cover.

CUMULATIVE AIR QUALITY IMPACTS

BACKGROUND

The PTA (Section 5.1.6 and Appendix 5.1F) describes the methodology for the cumulative effects analysis but does not include the analysis because a project list had not been provided by the District at the time the PTA was prepared. The cumulative analysis should include all reasonably foreseeable projects within a 6-mile radius, i.e.

the projects that have received construction permits but are not yet operational, and those that are in the permitting process or can be expected to be in permitting in the near future. A complete cumulative impacts analysis should identify all existing and planned stationary sources that affect the baseline conditions and consider them in the modeling effort.

DATA REQUESTS

A4. Please provide a copy of the District's correspondence regarding existing and planned cumulative sources located within six miles of the project site.

Response: Please refer to Attachment A4-1 for copies of correspondence with SCAQMD regarding existing and planned cumulative sources located within six miles of the project site.

A5. Please provide the list of sources to be considered in the cumulative air quality impact analysis.

Response: On June 16, 2015, the Project Owner requested an updated list of projects that are within a 6-mile radius of the Amended HBEP and are either currently in the permitting process, undergoing California Environmental Quality Act (CEQA) review, or recently received a Permit to Construct from the SCAQMD. Per correspondence provided in response to Data Request A4, the SCAQMD has not yet provided the requested information and noted that requests of this nature could take 90 days to complete. Therefore, the Project Owner will continue to work with SCAQMD through the end of 2015 to collect the requested information. The Project Owner will compile a source list based on the information obtained through the end of 2015, making conservative assumptions as necessary, and provide the source list to the CEC for review in January 2016. Specifically, the Project Owner would value the CEC's input on the appropriateness of excluding specific sources (sources with negligible emissions, administrative permit amendments with no increase in air emissions, and volatile organic compound [VOC] sources) and selecting modeled scenarios.[1]

A6. Please provide the cumulative modeling and impact analysis, including amended HBEP and other identified existing and planned projects within 6 miles of the amended HBEP site.

Response: A cumulative air quality impact analysis will be prepared using the methodology presented in the *Dispersion Modeling Protocol for the Amended Huntington Beach Energy Project* and associated modeling protocol addendum (see Appendix 5.1F of the HBEP PTA). The results of this analysis will be provided within 30 days of receipt of CEC comments on the source list provided in response to Data Request A5.

OPERATIONAL MITIGATION

BACKGROUND

District Rule 1304(a)(2) – Electric Utility Steam Boiler Replacement exempts certain replacement projects from emission offset requirements unless there is a basin-wide electricity generation capacity increase on a per-utility basis. The evaluation for offset exemption using the megawatt (MW) to MW calculation is based on the difference in gross MW of the new equipment and the stated permit values of MW of the equipment being removed from service.

Section 2.0 Project Description of the PTA states that the amended HBEP would consist of a 644-MW (net) two-on-one combined-cycle unit with GE 7FA.05 turbines and two GE LMS-100 PB simple-cycle gas turbine generators, each with a nominal capacity of 100-MWs. The PTA does not provide a summary of the capacity (on a gross basis) of each proposed unit and total capacity of the amended HBEP.

[1] Emergency equipment is normally permitted for fewer than 50 testing hours per year. It is highly unlikely that these tests would coincide with the simultaneous startup of all four HBEP turbines. Therefore, emergency equipment is not expected to be modeled for comparison to any 1-hour state or federal standards. This equipment will, however, be included in the modeling for all other averaging periods.

Page 5.1-28 of the PTA states that in order to qualify for the exemption, the project owner proposes to shut down 2 boilers in conjunction with the construction of the amended HBEP. The 2 boilers include boiler 1 (215-MW) at the Huntington Beach Generating Station (HBGS) and boiler 7 (480-MW) at AES' Redondo Beach Generating Station (RBGS). The total capacity of the boilers being shutdown is 695-MWs. Staff believes that the 695-MW might only be enough for the combined-cycle unit but not enough for the proposed amended HBEP project that also includes the two simple-cycle gas turbines at 100-MW each.

In addition, the above- mentioned retirement plan conflicts with that mentioned in the Preliminary Staff Assessment (PSA) for the Redondo Beach Energy Project (RBEP).

The retirement of RBGS boiler 7 (480-MW) and boilers 6 and 8 (66.4-MW of 655-MW) would be needed to ensure RBEP qualifies for the Rule 1304(a)(2) exemption. The retirement of RBGS boiler 7 cannot be used for both projects. Staff needs to make sure that the retirement plans for HBGS, RBGS, and Alamitos Generating Station (AGS) do not conflict with each other.

DATA REQUESTS

A7. Please provide a summary of the capacity of each proposed unit and total capacity of the amended HBEP on a gross basis.

Response: As staff has noted, the existing boilers proposed for retirement have changed. Table A7-1 presents the capacity of each proposed unit, the total capacity of the Amended HBEP, other Project Owner-proposed generation projects before the CEC, and the existing generation not proposed for retirement. The purpose of this table is to clearly show that the Project Owner controls sufficient existing generating capacity to fully comply with the SCAQMD's Rule 1304(a)(2) exemption for all projects currently undergoing licensing. Table A7-1 shows that the Project Owner controls approximately 1,153 MWs of surplus generation above the amount needed to comply with SCAQMD Rule 1304(a)(2).

TABLE A7-1

AES Rule 1304(a)(2) Schedule

Project	Phase	First Fire or Shutdown Date	MW Gross
HBEP	Combined-cycle Block [a]	10/1/2019	693.822
	HBGS Unit 1 Retired	11/1/2019	215
	RBGS Unit 7 Retired	10/1/2019	480
	Simple-cycle Block [b]	11/1/2023	201.628
	HBGS Unit 2 Retired	12/31/2020	215
	MW Installed		895.45
	MW Retired		910
	Surplus MW		14.55
Redondo Beach Energy Project (RBEP)	Combined-cycle Block	11/1/2019	546.4
	RBGS Unit 5 Retired	12/31/2019	175
	RBGS Unit 8 Retired	12/31/2019	480
	MW Installed		546.4
	MW Retired		655
	Surplus MW (HBEP and RBEP)		123.15
Alamitos Energy Center	Combined-cycle Block [c]	10/1/2019	692.951
	AGS Unit 1 Retired	12/29/2019	175
	AGS Unit 2 Retired	12/29/2019	175
	AGS Unit 5 Retired	12/29/2019	480
	AGS Unit 3 Retired	12/31/2020	320

TABLE A7-1

AES Rule 1304(a)(2) Schedule

Project	Phase	First Fire or Shutdown Date	MW Gross
	Simple-cycle Block [d]	6/1/2021	401.751
	MW Installed		1,094.702
	MW Retired		1,150
Total MWs Installed and Retired	Total MW Installed		2,536.552
	Total MW Retired		2,715.00
RBGS Units Not Proposed for Retirement	RBGS Unit 6		175
AGS Units Not Proposed for Retirement	AGS Unit 4 AGS Unit 6		320 480

Source: Adapted from Table 1 of Appendix 5.1E of the HBEP PTA.

[a] Based on 65.8 degrees Fahrenheit (°F) with evaporative coolers operating.
[b] Based on 65.8°F with evaporative coolers operating.
[c] Based on 59°F without evaporative coolers operating.
[d] Based on 59°F without evaporative coolers operating.

Notes:
AGS = Alamitos Generating Station
HBGS = Huntington Beach Generating Station
MW = megawatt
RBGS = Redondo Beach Generating Station

A8. Please provide retirement plans for HBGS, RBGS, and AGS to demonstrate that each turbine phase of the HBEP replacement project would qualify for District Rule 1304(a)(2) exemption.

Response: The Project Owner is required to provide a decommissioning/retirement plan to the SCAQMD to demonstrate compliance with SCAQMD Rule 1304(a)(2), and will provide said plan prior to the commencement of Amended HBEP construction. As noted in a November 12, 2015, letter from the SCAQMD (see Attachment A1-1), this schedule is sufficient for the SCAQMD to process the Amended HBEP air permit application. As such, the Project Owner will provide copies of any decommissioning/retirement plans submitted to the SCAQMD to the CEC.

AMBIENT AIR QUALITY MONITORING STATIONS

BACKGROUND

The Costa Mesa (North Coastal Orange County) monitoring station is the nearest and most representative ambient air quality monitoring station (about 3.5 miles to the northeast) to the amended HBEP site. However, the Costa Mesa station only measures ozone, carbon monoxide (CO), nitrogen dioxide (NO2), and sulfur dioxide (SO2). The project owner proposes to use Mission Viejo (Saddleback Valley) monitoring station, which is approximately 17 miles southeast of the amended HBEP site, for respirable particulate matter (PM10) and fine particulate matter (PM2.5). Staff believes that the Mission Viejo monitoring station is more representative for inland Orange County, rather than the coastal region where the amended HBEP would be located. In addition, there are some complex terrains between the amended HBEP site and the Mission Viejo monitoring station. Staff believes that the Mission Viejo monitoring station should not be selected as the most representative station for PM10 and PM2.5. In the Final Staff Assessment (FSA) for the licensed HBEP project, staff used Long Beach monitoring station (South LA County Costal 1) as the most representative monitoring station (for PM10 and PM2.5) for the project site. The Long Beach monitoring station is approximately 17 miles to the northwest of the project site and is more representative for the coastal region where the Amended HBEP would be located. There are no complex terrains between the Long Beach monitoring station and the amended HBEP site.

The highest PM10 background concentration measured at Long Beach monitoring station during 2011 through 2013 was 45 µg/m3. Complete background concentrations for the year 2014 are not available yet. The PTA shows that the maximum modeled PM10 concentration would be 5.69 µg/m3 when one of the GE 7FA.05 combustion turbines undergoes commissioning. The maximum modeled PM10 concentration would be 5.38 µg/m3 during either commissioning of the GE LMS-100 PB turbines or operation of the amended HBEP project. If the total PM10 impacts are calculated based on maximum modeled impacts and worst-case background concentrations from Long Beach station, the amended HBEP project would cause exceedance of the California

24-hour PM10 standard of 50 µg/m3. A more refined modeling analysis, such as reasonable temporal pairing of the modeled impacts and background data, is needed to show the compliance with the California 24-hour PM10 standard.

DATA REQUESTS

A9. Please update the PM10 and PM2.5 background data using Long Beach monitoring station (South LA County Costal 1) as the most representative monitoring station for the project site.

Response: The Amended HBEP is located in a jurisdiction designated as nonattainment for the state 24-hour particulate matter with an aerodynamic diameter less than or equal to 10 microns (PM_{10}) ambient air quality standard. Based on this attainment status, the Amended HBEP's PM_{10} impacts contribute to the existing violation of this standard, and would not contribute to a new violation. Since the Amended HBEP, like the approved and Licensed HBEP, would contribute to an existing violation of a state standard, emissions contributing to the nonattainment ambient air quality are required to be offset (under New Source Review of the federal Clean Air Act, the California Clean Air Act, and SCAQMD Rule 1303). The use of an ambient background concentration that is below the state 24-hour PM_{10} ambient air quality standard neither changes the jurisdiction's attainment status nor alters the conclusion that the Amended HBEP's PM_{10} impacts contribute to the existing violation of said standard. If the Project Owner were to remodel the Amended HBEP's PM_{10} impacts using the South Long Beach monitoring station's highest 24-hour PM_{10} background concentration and this modeling showed a combined impact below the state 24-hour PM_{10} standard, it would not alter the above conclusion or that emission offsets are required. The Project Owner will be mitigating the Amended HBEP's nonattainment air quality impacts by providing emission reduction credits (through SCAQMD Rule 1304(a)(2)) and surrendering Regional Clean Air Incentive Market (RECLAIM) Trading Credits. In addition to mitigating the Amended HBEP's potential to emit (PTE) air emissions as noted above, the Project Owner is providing air quality improvement project funding as required by SCAQMD Rule 1304.1 and ceasing operation of existing HBGS Units 1 and 2, which results in surplus emission reductions well above the Amended HBEP's PTE.

When determining representativeness of an ambient air monitoring station to the project site, land use, wind patterns, and the sources that could potentially affect the air monitoring station were considered, as follows:

- Figure A9-1 depicts the land uses surrounding the South Long Beach monitoring station, Amended HBEP site, and Mission Viejo monitoring station. As indicated, the South Long Beach monitoring station is surrounded by a mix of high- and medium-intensity developed areas. The Amended HBEP site is 50 percent surrounded by medium-intensity developed areas and 50 percent surrounded by open water. Lastly, the Mission Viejo monitoring station is 50 percent surrounded by medium- and low-intensity developed areas and 50 percent surrounded by low-intensity developed areas and open space. Based on this review, the land use surrounding the Amended HBEP site has more similarities to the Mission Viejo monitoring station than the South Long Beach monitoring station, making PM_{10} concentrations collected at the Mission Viejo monitoring station more representative of the Amended HBEP site than those collected at the South Long Beach monitoring station.[2]

- According to the SCAQMD's *Air Quality Monitoring Network Plan*[3], the South Long Beach monitoring station was sited to measure high concentrations of particulates from the Port of Long Beach and Port of Los Angeles and now has potential siting issues due to nearby development. This is further evidenced by the wind rose presented in Figure A9-2, which shows predominant winds from the northwest and south. Alternately, the wind rose from the National Weather Service John Wayne Airport monitoring station is presented in Figure A9-3 and demonstrates that the Amended HBEP site has a predominantly southwesterly wind profile and is neither influenced by these same industrial sources nor do impacts from the Amended HBEP affect the concentrations measured at the South Long Beach monitoring station. Therefore, PM_{10} concentrations collected at the South Long Beach monitoring station are not representative of the Amended HBEP site.

The above conclusions are further supported by the CEC and SCAQMD's review and approval of the Mission Viejo monitoring station as being representative of the project site during approval of the original HBEP air dispersion modeling protocol and SCAQMD's use of the Mission Viejo monitoring station for background PM_{10} concentrations in the Licensed HBEP Final Determination of Compliance modeling assessment (see Appendix Q of the FDOC – TN# 202774).

A10. Please provide a more refined modeling analysis if the sum of maximum modeled impacts and worst-case background concentrations would exceed any ambient air quality standards.

Response: Please see the response to Data Request A9; a revised modeling analysis is not warranted.

FUMIGATION ANALYSIS

BACKGROUND

The project owner evaluated the impacts of the combustion turbines and auxiliary boiler under fumigation conditions because these are special cases of meteorological conditions. PTA Table 5.1-32 and Table 5.1C.25 only show results for shoreline fumigation impacts analysis. Staff is not able to find impacts analysis for the inversion breakup fumigation. Staff is not able to find the modeling files and spreadsheet calculations associated with the fumigation analysis in the modeling CD that the project owner provided with the PTA.

The project owner used SCREEN3 to model the shoreline fumigation impacts. The SCREEN3 model is essentially a screening version of the ISCST3 model, which was replaced by AERMOD. U.S. EPA released a screening version of AERMOD, AERSCREEN, in 2010. AERSCREEN has replaced SCREEN3 as the recommended screening modeling tool. U.S. EPA has incorporated the fumigation algorithms in the new version of AERSCREEN (version 15181). The AERSCREEN (version 15181) model is capable of analyzing the fumigation impacts of the project.

DATA REQUESTS

A11. Please update all fumigation impacts analyses using AERSCREEN (version 15181).

Response: To assess both inversion breakup and shoreline fumigation impacts, modeling was performed using the stack parameters and emission rates from Appendix C, Tables 1 and 2, respectively, of Attachment A11-1. The particular operational scenario selected for each combustion unit modeled was chosen based on the load analysis results. In other words, only the parameters from the operational scenarios leading to the worst-case 1-hour NO_2,

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[2] Per Section 8.2.2C of the U.S. Environmental Protection Agency's (EPA) *Guideline on Air Quality Models* (2005), "If there are no monitors located in the vicinity of the source, a "regional site" may be used to determine background. A "regional site" is one that is located away from the area of interest but is impacted by similar natural and distant man-made sources."

[3] Accessible at http://www.aqmd.gov/docs/default-source/clean-air-plans/air-quality-monitoring-network-plan/aaqmnp-appendix-d.pdf?sfvrsn=9.

1-hour, 3-hour, and 24-hour SO_2, 1-hour and 8-hour CO, and 24-hour PM_{10} impacts were used. The effects of fumigation on the maximum modeled impacts were evaluated using AERSCREEN (version 15181), as recommended. Tables A11-1 and A11-2 present the potential Amended HBEP operational inversion breakup and shoreline fumigation impacts, respectively. As indicated in Table A11-1, the inversion breakup fumigation carbon monoxide (CO), nitrogen dioxide (NO_2), sulfur dioxide (SO_2), and PM_{10} concentrations combined with the background concentrations do not exceed the California Ambient Air Quality Standards (CAAQS) or National Ambient Air Quality Standards (NAAQS), as applicable. Therefore, inversion breakup fumigation impacts of CO, NO_2, SO_2, and PM_{10} would be less than significant. As indicated in Table A11-2, this is the same result for shoreline fumigation impacts. Details of the inversion breakup and shoreline fumigation modeling are presented in Appendix E of Attachment A11-1.

TABLE A11-1

Amended HBEP Operation Impacts Analysis – Inversion Breakup Fumigation Impacts Analysis Results Compared to the Ambient Air Quality Standards

Pollutant	Averaging Time	AERSCREEN Fumigation Result, µg/m³	Background Concentration, µg/m³ [a]	Total Predicted Concentration, µg/m³	CAAQS, µg/m³	NAAQS, µg/m³
NO_2 [b]	1-hour (max)	85.3	142	227	339	—
SO_2	1-hour (max)	5.45	20.2	25.7	655	—
	3-hour	5.32	20.2	25.5	—	1,300
	24-hour	5.21	5.20	10.4	105	—
CO	1-hour	529	3,321	3,850	23,000	40,000
	8-hour	147	2,519	2,666	10,000	10,000
PM_{10}	24-hour	10.6	51.0	61.6	N/A	150

[a] Background concentrations were the highest concentrations monitored during 2011 through 2013.

[b] The 1-hour NO_2 concentration includes an ambient NO_2 ratio of 0.80.

Note:

N/A = not applicable (i.e., area is designated nonattainment such that a comparison to the standard is not required)
µg/m³ = microgram(s) per cubic meter

TABLE A11-2

Amended HBEP Operation Impacts Analysis – Shoreline Fumigation Impacts Analysis Results Compared to the Ambient Air Quality Standards

Pollutant	Averaging Time	AERSCREEN Fumigation Result, µg/m³	Background Concentration, µg/m³ [a]	Total Predicted Concentration, µg/m³	CAAQS, µg/m³	NAAQS, µg/m³
NO_2 [b]	1-hour (max)	47.2	142	189	339	—
SO_2	1-hour (max)	3.52	20.2	23.7	655	—
	3-hour	3.55	20.2	23.8	—	1,300
	24-hour	2.13	5.20	7.33	105	—
CO	1-hour	125	3,321	3,446	23,000	40,000
	8-hour	37.6	2,519	2,557	10,000	10,000
PM_{10}	24-hour	10.5	51.0	61.5	N/A	150

[a] Background concentrations were the highest concentrations monitored during 2011 through 2013.

[b] The 1-hour NO_2 concentration includes an ambient NO_2 ratio of 0.80.

Note:

N/A = not applicable (i.e., area is designated nonattainment such that a comparison to the standard is not required)

A12. Please provide impacts analyses for both the shoreline fumigation and inversion breakup fumigation.

Response: Attachment A11-1 contains a revised AERSCREEN assessment, based on updates to emissions and operating profiles. This assessment also includes the revised shoreline fumigation and inversion breakup fumigation impacts, which are summarized above in the response to Data Request A11.

A13. Please provide the modeling files and spreadsheet calculations associated with the fumigation impacts analyses.

Response: The modeling files and spreadsheet calculations associated with the fumigation impacts analyses are included with this submission on compact disc.

COMMISSIONING OF THE COMBINED-CYCLE TURBINES

BACKGROUND

Page 5.1-15 of the PTA shows that initial modeling of 1-hour NO2 impacts that assumed commissioning of both combined-cycle turbines concurrently showed an exceedance of the California Ambient Air Quality Standard (CAAQS). Therefore, refined modeling was conducted assuming each turbine would undergo the worst-case commissioning phase separately. With the refined modeling, the project owner was able to show compliance with the 1-hour NO2 CAAQS.

DATA REQUEST

A14. Would the project owner accept a staff condition of certification (COC) to limit simultaneous commissioning of both the combined-cycle turbines to make sure the 1-hour NO2 CAAQS is not exceeded? If not, why not? If yes, please explain how onsite procedures would work to ensure no overlap of commissioning and provide a proposed COC.

Response: To assess commissioning impacts for the combined-cycle turbines, modeling was performed using the stack parameters, emission rates, and building parameters from Appendix B, Tables 1, 2, and 3, respectively, of Attachment A11-1[4]. The modeling assumed both combined-cycle turbines would be commissioned simultaneously at the highest unabated emissions expected during commissioning. NO_2 was modeled using the plume volume molar ratio method (PVMRM).

Table A14-1 presents the results of the GE Frame 7FA.05 commissioning impacts analysis. As indicated, the maximum predicted CO, NO_2, SO_2, annual PM_{10}, and $PM_{2.5}$ commissioning impacts combined with the background concentrations will be below the ambient air quality standards for each averaging period. For PM_{10}, the 24-hour background concentration exceeds the CAAQS without adding the modeled concentration. As a result, the predicted impact combined with the background concentration would be greater than the CAAQS. However, the commissioning activity would be finite, and the Project Owner will limit the hours of operation required to complete commissioning activities. Additionally, as described in Section 5.1.7.3 of the HBEP PTA, Amended HBEP emissions will be fully offset consistent with SCAQMD Rule 1303 through the SCAQMD internal offset bank under SCAQMD Rule 1304(a)(2). Therefore, impacts from GE Frame 7FA.05 commissioning will be less than significant.

TABLE A14-1
GE Frame 7FA.05 Commissioning Impacts Analysis – Maximum Modeled Impacts Compared to the Ambient Air Quality Standards

Pollutant	Averaging Time	Maximum Modeled Concentration, μg/m³	Background Concentration, μg/m³ [a]	Total Predicted Concentration, μg/m³	CAAQS, μg/m³	NAAQS, μg/m³

[4] Although Data Request A11 requested a revised fumigation impacts analysis, Attachment A11-1 presents completely revised results for the air quality and public health impacts analyses.

TABLE A14-1

GE Frame 7FA.05 Commissioning Impacts Analysis – Maximum Modeled Impacts Compared to the Ambient Air Quality Standards

Pollutant	Averaging Time	Maximum Modeled Concentration, μg/m³	Background Concentration, μg/m³ [a]	Total Predicted Concentration, μg/m³	CAAQS, μg/m³	NAAQS, μg/m³
CO	1-hour	4,341	3,321	7,662	23,000	40,000
	8-hour	3,000	2,519	5,519	10,000	10,000
NO_2	1-hour (max) [b]	169	142	311	339	—
	Annual [c]	0.66	21.8	22.5	57	100
SO_2	1-hour (max)	5.99	20.2	26.2	655	—
	3-hour	5.13	20.2	25.3	—	1,300
	24-hour	1.74	5.20	6.94	105	—
PM_{10}	24-hour	5.64	51.0	56.6	50	150
	Annual	0.57	19.3	19.9	20	—
$PM_{2.5}$	24-hour (98th percentile) [d]	3.33	21.3	24.6	—	35
	Annual	0.57	8.60	9.17	12	12

[a] Background concentrations were the highest concentrations monitored during 2011 through 2013.

[b] The maximum 1-hour NO_2 concentration is based on AERMOD PVMRM output with an in-stack NO_2 to NO_X ratio of 0.5 and an out-of-stack NO_2 to NO_X ratio of 0.9. Hourly paired ozone data are from the SCAQMD Costa Mesa monitoring station.

[c] The maximum annual NO_2 concentration includes an ambient NO_2 ratio of 0.75.

[d] The total predicted concentration for the federal 24-hour $PM_{2.5}$ standard is the 5-year average, high-8th-high modeled concentration combined with the 3-year average, 98th percentile background concentration.

Based on the modeling results presented in Table A14-1, the Amended HBEP would not exceed the 1-hour NO_2 CAAQS even when both combined-cycle turbines are commissioned simultaneously. Therefore, a Condition of Certification is not required.

OVERLAP IMPACTS ANALYSIS

BACKGROUND

Because of the 10-year demolition and construction schedule, there would be some overlap periods of demolition, construction, commissioning and operation. Page 5.1-23 shows that the project owner modeled two overlap periods:

- Combined-cycle power block operation with simultaneous construction of the simple-cycle power block (identified as **Overlap Scenario 1** in PTA).
- Combined-cycle and simple-cycle power block operation with simultaneous demolition of HBGS Units 1 and 2 (identified as **Overlap Scenario 2** in PTA).

The project owner also identified other potential overlap scenarios:

- The project owner addressed the impacts of the overlap period of the operation of the combined-cycle power block with commissioning of the simple-cycle power block in the commissioning impacts analysis. For simplicity, staff would like to identify this overlap period as **Overlap Scenario 3**.
- The project owner expects the operation of the combined-cycle power block to overlap with demolition of HBGS Units 3 and 4. For simplicity, staff would like to identify this overlap period as **Overlap Scenario 4**. The project owner expects that impacts associated with demolition of HBGS Units 3 and 4 would be

similar to those associated with demolition of HBGS Units 1 and 2. The project owner modeled **Overlap Scenario 2** which includes demolition of HGBS Units 1 and 2with operation of both power blocks, rather than just one. Thus the project owner did not model the impacts for **Overlap Scenario 4**.

Page 2-1 of the PTA shows that existing HBGS Unit 1 will be retired in the fourth quarter of 2019 to provide interconnection capacity for the new combined-cycle units and Unit 2 will be retired either after commercial operation of the HBEP simple-cycle units or at the final compliance deadline for once-through-cooling intake structures as determined by the State Water Resources Control Board. Thus staff believes that the operation of existing HBGS Units 1 and 2 would overlap with demolition of existing HBGS Unit 5 and fuel storage tanks, demolition and site preparation of the Plains Tank Farm area, and construction of the combined-cycle power block.

If retirement of HBGS Unit 2 is not required to provide interconnection capacity or Rule 1304 offset exemption, its operation would also overlap with the commissioning and operation of the combined-cycle power block, demolition of HBGS Units 3 and 4, construction, commissioning, and possibly operation of the simple-cycle power block.

DATA REQUESTS

A15. Please update the modeling analyses for **Overlap Scenario 1** and **Overlap Scenario 3** to include the operation of existing HBGS Unit 2.

Response: Once the Amended HBEP combined-cycle power block is operational and capable of generating 644 MWs with a 10-minute startup (30 minutes to Best Available Control Technology [BACT] levels for a warm and hot start), the potential that the load balancing authority will request operation of HBGS Unit 2 is highly unlikely for the following reasons:

- HBGS Unit 2 requires an extended startup period, measured in hours, not minutes like the Amended HBEP.
- HBGS Unit 2 operates at a heat rate of 10,563 British thermal units per kilowatt-hour (Btu/kWh)-net[5], which is significantly higher than the Amended HBEP combined-cycle power block's heat rate of approximately 6,118 Btu/kWh[6]. Therefore, it is the Project Owner's expectation that, if additional generation or ancillary services are required by the load balancing authority from the project area, the Amended HBEP will be dispatched consistent with the state loading order.[7]
- Air emissions from HBGS Units 1 and 2 are already included in the ambient background data used in the modeling analysis, such that incorporating HBGS Unit 2 into the modeling analysis would tend to double count air emission impacts.
- When the State Water Resources Control Board reissued the site's National Pollution Discharge Elimination System (NPDES) permit, they included a sunset provision for HBGS Units 1 and 2 to cease operation on December 31, 2020, with no provisions for operation beyond such date. Therefore, the likelihood that HBGS Unit 2 will be called into service from May to December 2020 remains very remote.

Based on the above conclusions, modeling operation of HBGS Unit 2 while the Amended HBEP's combined-cycle power block is operational does not represent a likely modeling scenario that will occur except under the most extreme electrical demand conditions.

A16. Please provide modeling analysis for **Overlap Scenario 4**, which should include operation of the combined-cycle power block, demolition of HBGS Units 3 and 4, and operation of existing HBGS Unit 2.

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[5] HBGS heat rate from the CEC's website, accessible at http://energyalmanac.ca.gov/electricity/web_qfer/Heat_Rates.php.

[6] HBEP PTA, Section 2.1.2.1, page 2-4.

[7] The "loading order" established that the state, in meeting its energy needs, would invest first in energy efficiency and demand-side resources, followed by renewable resources, and only then in clean conventional electricity supply. Refer to http://www.cpuc.ca.gov/NR/rdonlyres/58ADCD6A-7FE6-4B32-8C70-7C85CB31EBE7/0/2008_EAP_UPDATE.PDF.

Response: As noted in the response to Data Request A15, the potential for HBGS Unit 2 to be operated after the Amended HBEP combined-cycle power block is operating is highly unlikely. As such, revised modeling including the operation of existing HBGS Unit 2 is not provided.

Demolition of HBGS Units 3 and 4 will occur in the same location as construction of the simple-cycle power block, such that the source characterization and source locations are expected to be the same under either modeling scenario. As shown in Table A16-1, maximum daily emissions and maximum annual $PM_{2.5}$ emissions from demolition activities are less than those from construction activities, which suggests that modeled short-term impacts[8] and modeled annual particulate matter with an aerodynamic diameter less than or equal to 2.5 microns ($PM_{2.5}$) impacts from operation of the combined-cycle power block with simple-cycle power block construction would be greater than those from operation of the combined-cycle power block with demolition of HBGS Units 3 and 4. However, as shown in Table A16-1, maximum annual CO, VOC, NO_2, SO_2, and PM_{10} emissions from demolition activities are greater than those from construction activities.

TABLE A16-1
Comparison of Demolition of HBGS Units 3 and 4 and Simple-cycle Power Block Construction Emissions [a]

Construction Phase	Pollutant					
	CO	**VOC**	**NO_2**	**SO_2**	**PM_{10}**	**$PM_{2.5}$**
Demolition of HBGS Units 3 and 4						
Maximum Daily Emissions (lb/day)	38.0	0.77	3.45	0.06	2.07	0.33
Maximum Annual Emissions (tpy)	5.06	0.10	0.45	0.01	0.28	0.04
Simple-cycle Power Block Construction						
Maximum Daily Emissions (lb/day)	45.7	1.03	4.55	0.09	3.60	1.57
Maximum Annual Emissions (tpy)	4.21	0.09	0.40	0.01	0.24	0.07

[a] Onsite emissions taken from Appendix 5.1A of the HBEP PTA.

Notes:
lb/day = pound(s) per day
tpy = ton(s) per year

Although maximum annual CO, VOC, NO_2, SO_2, and PM_{10} emissions from demolition activities are greater than those from construction activities, modeled annual NO_2 and PM_{10} impacts from demolition activities are expected to be proportional to those from construction activities, based on the similarities in source characterization.[9] Table A16-2 presents the maximum annual NO_2 and PM_{10} emissions, as well as the expected increase in impacts when comparing demolition emissions to construction emissions.

TABLE A16-2
Expected Increase in Modeled Impacts

Construction Phase	Pollutant		
	NO_2	**Exhaust PM_{10}**	**Fugitive PM_{10}**
Maximum Annual Emissions (tpy) [a]			
Demolition of HBGS Units 3 and 4	0.45	0.01	0.27
Simple-cycle Power Block Construction	0.40	0.01	0.23
Expected Increase in Impacts [b]	**14%**	**13%**	**19%**

[a] Onsite emissions taken from Appendix 5.1A of the HBEP PTA.

[b] Expected increase in impacts calculated as the maximum annual demolition emissions divided by the maximum annual construction emissions.

[8] Short-term impacts refer to impacts associated with 1-hour, 3-hour, 8-hour, and 24-hour averaging periods.

[9] Only annual NO_2 and PM_{10} impacts were considered because there are no annual averaging periods for CO, VOC, or SO_2.

To assess the potential increase in modeled impacts as a result of including the demolition of HBGS Units 3 and 4 in place of simple-cycle power block construction, the maximum modeled impacts for Overlap Scenario 1 were first dissected to understand the relative contribution of construction activities. This contribution was then increased by the percentage presented in Table A16-2, and added to the maximum modeled impacts for Overlap Scenario 1. With this approach, the maximum predicted impacts from combined-cycle power block operation with demolition of HBGS Units 3 and 4 were conservatively estimated for comparison to the ambient air quality standards. The parameters used to generate this conservative estimation are presented in Table A16-3.

TABLE A16-3
Comparison of Demolition of HBGS Units 3 and 4 and Simple-cycle Power Block Construction Impacts

Construction Phase	Modeled or Predicted Annual Impacts (µg/m^3)		
	NO_2	Exhaust PM_{10}	Fugitive PM_{10}
Maximum Modeled Impacts for Overlap Scenario 1 [a]	0.70	0.88	
Contribution of Simple-cycle Power Block Construction to Overlap Scenario 1 Impacts [a]	0.082	0.015	0.83
Increase in Contributing Impacts [b]	0.011	0.0019	0.16
Maximum Predicted Impacts for Combined-cycle Power Block Operation with Demolition of HBGS Units 3 and 4 [c]	0.71	1.04	

[a] Maximum modeled impacts for Overlap Scenario 1 taken from Attachment A11-1, Table 3-16. Contribution is the modeled impact from simple-cycle power block construction activities at the maximum receptor location.

[b] Increase in contributing impacts calculated as the contribution of simple-cycle power block construction multiplied by the expected increase in impacts, shown in Table A16-2.

[c] Maximum predicted impacts for combined-cycle power block operation with demolition of HBGS Units 3 and 4 calculated as the sum of the increase in contributing impacts and the maximum modeled impacts for Overlap Scenario 1.

As shown in Table A16-4, the potential impacts from combined-cycle power block operation with demolition of HBGS Units 3 and 4 would not exceed the annual state or federal standards for NO_2, but would exceed the annual state standard for PM_{10}. This result is consistent with that for Overlap Scenario 1, and would be mitigated through the Project Owner's program to reduce local PM_{10} during construction by sweeping 0.81 mile of local roadways once per month for the duration of the construction period. Therefore, modeling of Overlap Scenario 4 is not warranted as it is not expected to result in modeled impacts significantly different than those already provided for Overlap Scenario 1.

TABLE A16-4
Combined-cycle Power Block Operation with Demolition of HBGS Units 3 and 4 – Maximum Predicted Impacts Compared to the Ambient Air Quality Standards

Pollutant	Averaging Time	Maximum Predicted Concentration, µg/m^3	Background Concentration, µg/m^3 [a]	Total Predicted Concentration, µg/m^3	CAAQS, µg/m^3	NAAQS, µg/m^3
NO_2	Annual	0.71	21.8	22.5	57	100
PM_{10}	Annual	1.04	19.3	20.3	20	—

[a] Background concentrations were the highest concentrations monitored during 2011 through 2013.

A17. Please provide modeling analysis to evaluate the overlap impacts due to the operation of existing HBGS Units 1 and 2 with the worst-case emissions from demolition of existing HBGS Unit 5 and fuel storage tanks, demolition and site preparation of the Plains Tank Farm area, and construction of the combined-cycle power block. For simplicity, staff would like to identify this overlap period as **Overlap Scenario 5**.

Response: Operation of existing HBGS Units 1 and 2 is already captured in the ambient background levels used for the Amended HBEP air dispersion modeling analysis. As such, modeling results for Overlap Scenario 5 are not provided.

A18. Please provide modeling analysis to evaluate the overlap impacts due to the operation of existing HBGS Unit 2 and commissioning of the combined-cycle power block. For simplicity, staff identifies this overlap period as **Overlap Scenario 6**.

Response: Operation of the existing HBGS Units is already captured in the ambient background levels used for the Amended HBEP air dispersion modeling analysis. Also, as noted in the response to Data Request A15, the potential for HBGS Unit 2 to be operated after the Amended HBEP combined-cycle power block is operating is highly unlikely. As such, revised modeling including the operation of existing HBGS Unit 2 is not provided.

AUXILIARY BOILER IMPACTS ANALYSIS

BACKGROUND

PTA Table 5.1-13 and Appendix Table 5.1B.11 show the maximum hourly emission rates for the auxiliary boiler assuming 100 percent load. However, the short-term emissions rates used in the modeling analysis (which are shown in Appendix Tables 5.1C.5, 5.1C.9, 5.1C.13, 5.1C.16, 5.1C.20, etc.) were half of those shown in Table 5.1-13. The annual emission rates used in the modeling (which are shown in Appendix Tables 5.1C.5, 5.1C.9, 5.1C.16, 5.1C.20, etc.) were also lower than those shown in Appendix Table 5.1B.11. Staff would like to know why the modeled emissions of the auxiliary boiler would be lower than those shown in Table 5.1-13 and Appendix Table 5.1B.11.

The PTA did not include estimated emissions and impacts analyses for the commissioning of the auxiliary boiler. The PTA did not include impacts analyses for the startup of the auxiliary boiler. Staff would like to know whether the commissioning of the auxiliary boiler would overlap with the commissioning of the combined-cycle turbines. Staff would also like to know whether the startup of the auxiliary boiler would overlap with the startup of the combined-cycle turbines or the simple-cycle turbines.

DATA REQUESTS

A19. Please justify why the modeled emissions of the auxiliary boiler would be lower than those shown in Table 5.1-13 and Appendix Table 5.1B.11.

Response: The emissions modeled for the auxiliary boiler were incorrect. The revised modeling analysis (presented in Attachment 11-1) has been updated based on the emissions shown in Table 5.1-13 and Appendix Table 5.1B.11 of the HBEP PTA.

A20. Please update the modeling analysis if the modeled emissions of the auxiliary boiler were incorrect.

Response: The updated modeling analysis is presented in Attachment A11-1.

A21. Please provide estimated emissions and impacts analyses for the commissioning of the auxiliary boiler.

Response: The auxiliary boiler commissioning process includes first burner light-off, conditioning, establishing the air/fuel ratio curve, and establishing the selective catalytic reduction ammonia injection curve. The auxiliary boiler commissioning will occur over 5 days and will require up to 6 fired hours per day. The auxiliary boiler commissioning emissions will be the same as the auxiliary boiler cold startup emissions, presented in Table A21-1 below. As the auxiliary boiler commissioning will not overlap with operation of any other Amended HBEP emission source, an impacts analysis is not required.

TABLE A21-1
Auxiliary Boiler Commissioning Emissions

Startup	NO_X Pounds	CO Pounds	VOC Pounds
Daily Emissions	8.44	8.68	9.36
Total Commissioning Emissions	42.2	43.4	46.8

A22. Please clarify whether the commissioning of the auxiliary boiler would overlap with the commissioning of the combined-cycle turbines. If yes, please update the modeling analysis for the commissioning of the combined-cycle turbines by adding the commissioning of the auxiliary boiler. If no, please explain how onsite procedures would work to ensure no overlap of commissioning and provide a proposed COC.

Response: The auxiliary boiler commissioning will not be performed while any other Amended HBEP emission source is operating.

A23. Please clarify whether the startup of the auxiliary boiler would overlap with the startup of the combined-cycle turbines or the simple-cycle turbines. If yes, please update the modeling analysis for the startup of the combined-cycle turbines or the simple-cycle turbines by adding the startup of the auxiliary boiler. If no, please explain how onsite procedures would work to ensure no overlap of startups and provide a proposed COC.

Response: The auxiliary boiler was not modeled in startup mode as part of the worst-case operational modeling scenarios for 1-hour NO_2 and 1-hour CO because startup of the auxiliary boiler only occurs prior to startup of one of the combined-cycle combustion turbines. Additionally, steady-state operation of the auxiliary boiler has a higher hourly CO emission rate (2.83 pounds per hour [lb/hr]) than during startup (1.53 lb/hr).

In this scenario without operation of the combined-cycle combustion turbines, total facility NO_2 emissions would be a maximum of 45.6 lb/hr (22.1 lb/hr from each of the two simple-cycle combustion turbines and 1.5 lb/hr from auxiliary boiler startup). This emissions scenario is much lower than the scenario presented in the worst-case operational modeling scenario, which assumes steady-state auxiliary boiler operation, cold startup of two combined-cycle combustion turbines, and startup of two simple-cycle combustion turbines, totaling 167 lb/hr of NO_2 emissions. Therefore, modeling startup of the auxiliary boiler with startup and/or operation of the simple-cycle combustion turbines for the 1-hour modeling scenarios is not provided. Note that startup of the auxiliary boiler was included in modeling of the longer averaging periods. As the worst-case operating scenario has been modeled, a Condition of Certification is not required.

CONSTRUCTION/DEMOLITION SCHEDULE INCONSISTENCIES

BACKGROUND

Page 5.1-5 of the Air Quality section of the PTA shows that demolition and construction activities would occur 10 hours per day, 23 days per month. Page 2-13 of the Project Description section shows that the construction plan is based on a single 10-hour shift/6 days per week.

Air Quality Appendix 5.1A shows emission estimates and schedule for different phases of demolition and construction activities. Figure 2.2-1 of the Project Description section provides an integrated schedule for the demolition and construction activities. Staff noticed the following inconsistencies in the schedules provided in these two sections. Staff would like to know which version of the construction schedule is correct. Staff would like to make sure that the project owner has conservatively estimated worst-case emissions for different phases of demolition and construction.

Activities	Appendix 5.1A	Figure 2.2-1
Demolition of Unit 5, fuel storage tanks and Plains Tank Farm	17 months (1-17)	16 months (1-16)

Construction of Combined Cycle Power Block	35 months (18-52)	36 months (17-52)
Demolition of Units 3 and 4	24 months (53-76)	20 months (53-72)
Construction of Simple Cycle Power Block	20 months (77-96)	24 months (73-96)

DATA REQUESTS

A24. Please clarify which version of the demolition and construction schedule is correct.

Response: The construction schedule presented in Table A24-1 is the correct schedule, consistent with the schedule presented in Appendix 5.1A of the HBEP PTA. The work schedule presented as 10 hours per day, 6 days per week was shown to be the maximum allowable work schedule, consistent with the City of Huntington Beach Noise Ordinance.

TABLE A24-1
Amended HBEP Construction Schedule

Event	Duration
Demolition of Unit 5, fuel storage tanks, and Plains Tank Farm	17 months (1-17)
Construction of Combined-cycle Power Block	35 months (18-52)
Demolition of Units 3 and 4	24 months (53-76)
Construction of Simple-cycle Power Block	20 months (77-96)

A25. Please verify whether conservative assumptions were made to estimate the worst-case emissions for different phases of demolition and construction. If not, please update the emissions with the correct demolition and construction schedule.

Response: The construction/demolition schedule presented in Appendix 5.1A of the HBEP PTA is the correct schedule. As such, conservative assumptions were used in estimating the worst-case emissions for the different phases of Amended HBEP demolition and construction.

BACT ANALYSIS

BACKGROUND

On October 13, 2015, the project owner provided an updated Best Available Control Technology (BACT) assessment (TN # 206358) in response to the District's incompleteness letter. The PM10/PM2.5 BACT level for the combined-cycle turbines has been updated to 8.5 lb/hr. However, the emissions tables and impacts analysis in the PTA were based on 9.0 lb/hr BACT level. Staff would like to know if the emissions tables and impacts analysis would be updated accordingly.

DATA REQUEST

A26. Please verify whether the emissions tables and impacts analysis would be updated with the updated BACT level for PM10/PM2.5. If not, please justify why they will not be updated.

Response: The emissions tables and impacts analysis for PM_{10} and $PM_{2.5}$ have been revised to match the updated, proposed $PM_{10}/PM_{2.5}$ BACT levels, as submitted to the SCAQMD on October 13, 2015. The revised emissions tables and modeling results are presented in Attachment A11-1.

CARBON POLLUTION STANDARDS FOR NEW POWER PLANTS

BACKGROUND

On August 3, 2015, the U.S. EPA Administrator, Gina McCarthy, signed a final rule[10] under Clean Air Act section 111(b) to limit the greenhouse gas emissions from new, modified, and reconstructed stationary sources: electric utility generating units. The final rule eliminates the originally-proposed criteria and establishes different limits of greenhouse gas emissions for base load and non-base load natural gas-fired turbines. A "base load" natural gas fired turbine is defined as one that has a capacity factor in percentage above the lower heating value efficiency of the turbine, expressed as a percentage. Correspondingly, a "non-base load" natural gas fired turbine is one that has a capacity factor less than or equal to the lower heating value efficiency of the turbine, expressed as a percentage, with the value capped at 50 percent. Staff would like verification that the Amended HBEP would comply with this final rule.

DATA REQUEST

A27. Please demonstrate how the amended HBEP would comply with the recently- signed carbon pollution standards for new power plants.

Response: EPA promulgated New Source Performance Standard Subpart TTTT, which includes two potentially applicable GHG emission limits for newly constructed combustion turbines. A newly constructed or reconstructed stationary combustion turbine that supplies more than its design efficiency times its potential electric output as net-electric sales on a 3-year rolling average basis and combusts more than 90 percent natural gas on a heat input basis on a 12-operating-month rolling average basis must meet a limit of 450 kilograms (kg) of carbon dioxide (CO_2) per megawatt-hour (MWh) of gross energy output (1,000 pounds [lb] of CO_2 per MWh), or 470 kg of CO_2 per MWh of net energy output (1,030 lb CO_2/MWh).

A newly constructed or reconstructed stationary combustion turbine that supplies its design efficiency times its potential electric output or less as net-electric sales on a 3-year rolling average basis and combusts more than 90 percent natural gas on a heat input basis on a 12-operating-month rolling average basis must meet a limit of 50 kg CO_2 per gigajoule (GJ) of heat input (120 lb CO_2 per million British thermal units [MMBtu]).

The applicable emission standard depends on whether a combustion turbine sells more electricity than its potential electrical output, which is calculated by multiplying the design efficiency and the potential electrical output, and combusts more than 90 percent natural gas. Assuming the combined-cycle power block will generate more electricity than the potential electrical output, the Amended HBEP will need to comply with the 1,000 lb of CO_2 per MWh emission limit. The Amended HBEP is exclusively fueled by natural gas with a combined-cycle power block design efficiency of approximately 56 percent. The Amended HBEP's combined-cycle GHG efficiency is estimated at 766 lb of CO_2 per MWh-Net, assuming an 8 percent performance degradation, which clearly complies with Subpart TTTT's emission limit of 1,000 lb of CO_2 per MWh.

The Amended HBEP simple-cycle power block design efficiency is 41 percent and the potential Amended HBEP simple-cycle power block's electrical output threshold is 718,320 MWh-Net (based on the design efficiency of 41 percent and the net electrical output of 200 MW for 8,760 hours per year). The Amended HBEP simple-cycle power block's potential annual net electric sales are 376,800 MWh-Net, assuming 200 MWs-Net of generation

[10] USEPA 2015 - Environmental Protection Agency, Final Carbon Pollution Standards for New, Modified and Reconstructed Power Plants, August 3, 2015. The EPA Administrator, Gina McCarthy, signed the following notice on August 3, 2015, and EPA is submitting it for publication in the Federal Register (FR).

and 1,884 hours per year of operation (1,750 operating hours plus 58 startup and 76 shutdown hours). Since the annual net electric sales are less than the electric output threshold, the Amended HBEP simple-cycle power block must comply with Subpart TTTT's emission limit of 50 kg CO_2 per GJ of heat input (120 lb CO_2/MMBtu). As a natural-gas fired facility, the Amended HBEP is expected to emit CO_2 at a rate of 114 lb CO_2/MMBtu, thereby complying with the applicable emission limit in Subpart TTTT.

Attachment A1-1
Correspondence with SCAQMD That is Not Yet Docketed

South Coast
Air Quality Management District
21865 Copley Drive, Diamond Bar, CA 91765-4178
(909) 396-2000 · www.aqmd.gov

November 12, 2015

Mr. Stephen O'Kane
Manager
AES Huntington Beach, LLC
21730 Newland St
Huntington Beach, CA 92646

Subject: Amended Huntington Beach Energy Project (ID# 115389)

Dear Mr. O'Kane,

On September 8, 2015 we received your application submittal for the proposed Amended Huntington Beach Energy Project to be located at the Huntington Beach Generating Station. On September 30, 2015 the applications were deemed incomplete and we requested additional data. On October 13, 2015 we received your response to that data request. All issues were addressed, except for the decommissioning plan for the boilers to be shutdown. We will not hold the completeness determination based on submittal of a decommissioning plan, but the plan must be submitted prior to the start of construction of the HBEP.

In an email dated November 3, 2015 we requested further information. On November 11, 2015 we received your response to that data request.

We have been informed that the emission factor used to estimate PM10 from the combined cycle turbines will be changed from 9.0 lbs/hr to 8.5 lbs/hr. This change will result in changes to the emission estimates and the modeling for PM10. Furthermore, during the course of our review, it was revealed that an emission concentration of 0.5 ppm was used to estimate VOC emissions from the combined cycle turbines. This is not correct. The correct emission concentration to use for estimating VOC emissions is the BACT limit of 2.0 ppm. Please provide the revised emission estimates for PM10 and VOC and the revised modeling for PM10.

Your applications continue to be incomplete at this time. Please be aware that additional clarifying information may be needed during the course of our full engineering evaluation. Your cooperation is key to the timely review of the applications. Please provide the requested information no later than 30 days from the date of this letter.

Feel free to contact me at (909) 396-2643, or alee@aqmd.gov, for further information or clarification.

Sincerely,

Charles Tupac, for

Andrew Lee, P.E.
Senior Engineering Manager
Engineering and Compliance

Cc: Jerry Salamy/CH2M Hill (jerry.salamy@ch2m.com)
Mohsen Nazemi
Charles Tupac
John Yee
Chris Perri

Attachment A4-1
Correspondence with SCAQMD Regarding Cumulative Sources

Engel, Elyse/SJC

From: Smoker, Beth/SAC
Sent: Tuesday, June 16, 2015 4:13 PM
To: PublicRecordsRequests@aqmd.gov
Cc: Engel, Elyse/SJC
Subject: HBEP - Public Records Request
Attachments: HBEP_SCAQMD_Public_Records_Request_061615.pdf

Hi,

Please find our Public Records Request attached. Please be sure to read the Memo attached within it and let me know if you have any questions.

Thanks,

Beth Smoker

Environmental Scientist / CH2M HILL / 2485 Natomas Park Drive, Suite 600, Sacramento, CA 95833 / 916.286.0259 / beth.smoker@ch2m.com

South Coast
Air Quality Management District
21865 Copley Drive, Diamond Bar, CA 91765-4178
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Information Management
Public Records Unit

Direct Dial: (909) 396-3700
FAX: (909) 396-3330

PUBLIC RECORDS REQUEST FORM

PRU Office Use Only
CONTROL NUMBER

ATTENTION REQUESTOR: To expedite your request for District records, please fill out this form completely, and identify specifically the type of records you are requesting. Please limit your request to one facility or one site address for each request form filed, and three requested items per form. Additional forms or pages can be used if requesting information for more than one facility or for records not identified on this form. Requests should reasonably describe identifiable records prepared, owned, used, or retained by the District. Public Records Unit staff is available to assist you in identifying those records in the District's possession. The District is not required by law to create a new record or list from an existing record.

REQUESTOR INFORMATION

NAME: Beth Smoker		DATE: 6/16/15
COMPANY: CH2M		
MAILING ADDRESS: 2485 Natomas Park Drive		
CITY: Sacramento	STATE: CA	ZIP CODE: 95833
PHONE NUMBER: (916) 286-0259	FAX NUMBER: (916) 920-8463	
EMAIL ADDRESS: beth.smoker@ch2m.com		

REQUESTED RECORDS (*3 items per form*)

☐ Applications (APPLS)	☐ Complaints	☐ Asbestos Notifications/Records
☐ Permits to Operate (P/O)	☐ Site Inspection Reports (I/R)	☐ Facility Potential to Emit (PTE)
☐ Equipment List Report (EQL)	☐ Emissions Summary	☐ Facility Positive Balance (NSR)
☐ Notices of Violation (NOV)	☐ Source Test Reports (S/T RPTS)	☐ Toxic-Health Risk Assessment (HRA)
☐ Notices to Comply (N/C)	☐ Air Monitoring Data	☑ Other (describe below or on additional pages):

See attached memo.

TIME PERIOD OF DOCUMENTS REQUESTED	From: 5/7/13	To: Present

REQUESTED FACILITY INFORMATION (If Applicable)

FACILITY NAME:		
FACILITY ADDRESS:		
CITY:	STATE:	ZIP CODE:
FACILITY I.D. NO. (if known):	APPL. AND/OR PERMIT NO. (if known):	

***Direct cost of duplication**: $.15 per page for paper copies (first 10 pages free) and $5.00 per copied audio tape. No charge for copied Diskettes or CDs. Transfer of gathered electronic records onto CD or Diskette typically costs $10.00 each, but costs will vary (see Instructions for Requesting Records).*

☑ I wish to inspect the requested records, where applicable, or receive the requested records electronically at no charge. I do not want copies produced at this time.

☐ I request that the SCAQMD contact me prior to copying the requested records if the cost exceeds $20.00.

☐ I would like copies of the requested records and I hereby agree to reimburse the SCAQMD for the direct cost of duplication in accordance with Gov. Code Sec. 6253(b).

E Smoker

Signature of Requestor

Note: After a preliminary estimate, advance payment may be required.

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT

INSTRUCTIONS FOR REQUESTING RECORDS

(California Public Records Act, Govt. Code Sections 6250-6276.48)

1. In order to expedite your request, requests for records should be in writing. Requests will be processed in the order in which they are received. A Public Records Request Form can be faxed to you by calling (909) 396-3700 and following the menu options. A form is also available on the A.Q.M.D.'s web page at *http://*www.aqmd.gov. Select the "Contact Us" menu, followed by the "Public Records" menu. Requests may be submitted by facsimile to (909) 396-3330, or by email to PublicRecordsRequests@aqmd.gov.

2. Requests must be for records prepared, owned, used, or retained by the District (Gov. Code Sec. 6252(e)). Requests should be for clearly identifiable records. If necessary, the District will assist the requestor in making a request that describes reasonably identifiable records (Gov. Code Sec. 6253.1). Copies will not be provided if disclosure would infringe upon a copyright, trade secret, or is otherwise exempt in accordance with state law.

3. A search for facility records can only be conducted by one or all of the following:

   Facility Name, Address, or Identification Number;

   Facility Application Number, or Permit to Operate Number; or

   Facility Notice of Violation/Notice to Comply Number.

4. You will be notified by mail within ten (10) days whether your request seeks copies of disclosable public records prepared, owned, used, or retained by this agency. In most cases, your request will be completed within 3-4 weeks.

5. If the search for records finds the records voluminous, you will be notified of the approximate number of pages and/or length of time it will take to process your request.

6. If the records you requested have been marked confidential by the source of the record, you will be notified and given the option of continuing with the District's trade secret process.

7. If your request is to review records, rather than receive copies, the District will notify you once the records are gathered, and arrangements will be made for your review.

8. The charge for the direct cost of duplication is as follows: Paper Copies, $0.15/page each over 10 pages (first 10 pages are free); Copied CD's or Copied Diskettes, no charge; and Copied Audio Tapes, $5.00 each. When records are requested in electronic format, the requestor shall bear the cost of producing a copy of the record, including the cost to construct the record and the cost of programming and computer services necessary to produce a copy of the record when either of the following applies: (1) the District would be required to produce a copy of an electronic record and the record is one that is produced only at otherwise regularly scheduled intervals, or (2) the request would require data compilation, extraction, or programming to produce the record. (Gov. Code Sec. 6253.9(b)). The transfer of gathered electronic records onto CD or Diskette typically cost $10.00 each. An invoice will accompany your records when completed.

9. For further clarification please refer to the California Public Records Act (California Gov. Code Sec. 6250 et seq.) and/or the District's Guidelines for Implementing the California Public Records Act. The Guidelines are available in the lobby of the District Headquarters or on the District's web site at www.aqmd.gov.

If you have questions pertaining to the submittal of a Public Records Act request, you may contact the Public Records Unit, **(909) 396-3700, Tuesday through Friday, 7:00 a.m. to 5:30 p.m. Our Fax number is (909) 396-3330. Our email address is PublicRecordsRequests@aqmd.gov.**

(Rev. 10/05/06-lkoenig)

TECHNICAL MEMORANDUM

Public Records Request for Cumulative Source Information for the Huntington Beach Energy Project

PREPARED FOR:	Public Records, South Coast Air Quality Management District
PREPARED BY:	Beth Smoker/CH2M
DATE:	June 16, 2015

CH2M HILL Engineers, Inc. (CH2M) is currently preparing a Petition to Amend (PTA) for the Huntington Beach Energy Project (HBEP), which was licensed by the California Energy Commission (CEC) on October 29, 2014. In November 2014, AES received notice from Southern California Edison that it was shortlisted for a power purchase agreement (PPA) requiring a power plant configuration different from that licensed by the CEC. Therefore, AES is amending the HBEP's CEC license to be consistent with the PPA.

AES Southland Development, LLC (AES) proposes to construct the Amended HBEP at the existing AES Huntington Beach Generating Station site, located at 21730 Newland Street in Huntington Beach, California. The Amended HBEP will consist of one two-on-one combined-cycle power block and one simple-cycle power block with a net capacity of 844 megawatts. The combined-cycle power block will consist of two General Electric (GE) 7FA.05 natural-gas-fired combustion turbines, one steam turbine, and an air-cooled condenser. The simple-cycle power block will consist of two GE LMS100PB natural-gas-fired combustion turbines and two closed-loop cooling fin fan coolers.

A cumulative air quality impact analysis will be required by the CEC as part of the PTA process. Prior to completing the cumulative impact analysis, the CEC requests that the applicant contact the respective air districts to obtain the appropriate source information. Therefore, on behalf of AES, CH2M would like to request a list of all stationary sources (including their physical address) of new or modified emissions which meet each of the following criteria:

1) Sources that are located within a six-mile radius of the Amended HBEP,
2) Sources that have recently received construction permits but are not yet operational or are currently in the permitting process (such as the New Source Review or California Environmental Quality Act permitting process), and
3) Sources that have a potential to emit five tons or more per year of nitrogen oxides (NOx), carbon monoxide (CO), particulate matter less than 10 microns in aerodynamic diameter (PM_{10}), particulate matter less than 2.5 microns in aerodynamic diameter ($PM_{2.5}$), or sulfur oxides (SOx).

Based on the three criteria above, it is anticipated that the following sources would be excluded from the cumulative impact analysis: sources that only emit volatile organic compounds (VOC), equipment shutdowns, permit-exempt equipment registrations, rule compliance, permit renewals, or replacement/system upgrades.

A list of zip codes within a six-mile radius of the Amended HBEP is attached. **Note that a similar request was submitted on April 24, 2013, and deemed complete on May 7, 2013. As such, CH2M requests that the South Coast Air Quality Management District only consider sources that may have received construction permits or entered into the permitting process since May 7, 2013.**

If you have any questions regarding this request or if there are additional data request forms required, please contact Beth Smoker (beth.smoker@ch2m.com) at (916) 286-0259.

Amended Huntington Beach Energy Project
List of Zip Codes within a 6-mile Radius of the Amended HBEP
June 2015

NAME	POSTAL
Huntington Beach	92648
Santa Ana	92704
Midway City	92655
Huntington Beach	92647
Huntington Beach	92649
Westminster	92683
Costa Mesa	92627
Fountain Valley	92708
Costa Mesa	92626
Newport Beach	92661
Newport Beach	92660
Huntington Beach	92646
Santa Ana	92707
Newport Beach	92663
Newport Beach	92662
Corona del Mar	92625

Engel, Elyse/SJC

From: Smoker, Beth/SAC
Sent: Monday, June 22, 2015 1:20 PM
To: Engel, Elyse/SJC
Subject: FW: Request for Records from the South Coast Air Quality Management District #81979,

FYI for our HBEP 6 mile request

-----Original Message-----
From: Lisa Ramos [mailto:lramos1@aqmd.gov]
Sent: Thursday, June 18, 2015 6:39 AM
To: Smoker, Beth/SAC; OB PR Support NA Docs
Subject: Request for Records from the South Coast Air Quality Management District #81979,

BETH SMOKER
2485 NATOMAS PARK DR
SACRAMENTO, CA 95833-

RE: Request for Records
Control #: 81979
Request: LIST OF STATIONARY SOURCES OF NEW OR MODIFIED EMISSIONS WITHIN 6 MI. RADIUS OF AMENDED HUNTINGTON BEACH ENERGY PROJECT ZIP CODE LIST ATTACHED, RECEIVING P/O'S OR ENTERING PERMITTING PROCESS SINCE MAY 7 2013.

Your request for records has been recieved by the Public Records Unit and has been assigned for processing.

Should you have any questions or need additional information, please do not hesitate to contact me at (909) 396-3700, Tuesday through Friday, between the hours of 8:00 a.m. 4:30 p.m. Please reference your Control Number listed above in all communications and correspondence.

Sincerely,

LISA RAMOS

For Colleen Paine
Public Records Coordinator

Engel, Elyse/SJC

From: Lisa Ramos <lramos1@aqmd.gov>
Sent: Thursday, October 22, 2015 1:25 PM
To: Engel, Elyse/SJC
Cc: OB PR Support Docs
Subject: RE: SCAQMD PRR #81979,

Elyse,
I forwarded your email to our contacts for a status/timeframe. These types of requests are taking 90+ days for processing due to the high volume of PRR's.

Lisa Ramos
South Coast A.Q.M.D
Public Records Unit
909.396.3211

From: Elyse.Engel@ch2m.com [mailto:Elyse.Engel@ch2m.com]
Sent: Thursday, October 22, 2015 10:04 AM
To: Lisa Ramos
Cc: OB PR Support NA Docs
Subject: SCAQMD PRR #81979

Hi Lisa,

I wanted to follow-up on the status of Public Records Request #81979. This request was initially filed by Beth Smoker on June 18, 2015. On July 10, 2015, Beth requested that you switch the e-mail address associated with this request from hers (beth.smoker@ch2m.com) to mine (elyse.engel@ch2m.com). I have not received any notifications from the SCAQMD regarding this request since July 10th. Therefore, to my knowledge, this request is still outstanding and we are still waiting on receipt of the requested information. Please let me know when we may expect to receive the requested information.

Thanks,
Elyse

Elyse Engel, EIT
Associate Engineer
D 1 669 800 1012
elyse.engel@ch2m.com

CH2M
1737 North First Street, Suite 300
San Jose, California 95112
www.ch2m.com

Engel, Elyse/SJC

From: Lisa Ramos <lramos1@aqmd.gov>
Sent: Wednesday, October 28, 2015 9:34 AM
To: Engel, Elyse/SJC
Cc: OB PR Support Docs
Subject: RE: SCAQMD PRR #81979

Elyse,
This request is still in the processing phase. I forwarded your email to the appropriate contacts.

Lisa Ramos
South Coast A.Q.M.D
Public Records Unit
909.396.3211

From: Elyse.Engel@ch2m.com [mailto:Elyse.Engel@ch2m.com]
Sent: Thursday, October 22, 2015 10:04 AM
To: Lisa Ramos
Cc: OB PR Support NA Docs
Subject: SCAQMD PRR #81979

Hi Lisa,

I wanted to follow-up on the status of Public Records Request #81979. This request was initially filed by Beth Smoker on June 18, 2015. On July 10, 2015, Beth requested that you switch the e-mail address associated with this request from hers (beth.smoker@ch2m.com) to mine (elyse.engel@ch2m.com). I have not received any notifications from the SCAQMD regarding this request since July 10th. Therefore, to my knowledge, this request is still outstanding and we are still waiting on receipt of the requested information. Please let me know when we may expect to receive the requested information.

Thanks,
Elyse

Elyse Engel, EIT
Associate Engineer
D 1 669 800 1012
elyse.engel@ch2m.com

CH2M
1737 North First Street, Suite 300
San Jose, California 95112
www.ch2m.com

Engel, Elyse/SJC

From: Lisa Ramos <lramos1@aqmd.gov>
Sent: Friday, November 20, 2015 1:54 PM
To: Engel, Elyse/SJC
Cc: OB PR Support NA Docs
Subject: Public Records Request #81979

Elyse Engel

I did not hear back from our contacts for the status. I forwarded your email again & I will respond as soon as I know something.

Lisa Ramos
South Coast A.Q.M.D
Public Records Unit
909.396.3211

From: Elyse.Engel@ch2m.com [mailto:Elyse.Engel@ch2m.com]
Sent: Tuesday, November 17, 2015 4:16 PM
To: Lisa Ramos
Cc: OB PR Support Docs
Subject: RE: SCAQMD PRR #81979

Hi Lisa,

It's been nearly 3 weeks since we last touched based on PRR #81979. Since that time, I still have not received any feedback / information from the SCAQMD. Can you please advise when I may expect to begin receiving information from the various contacts?

Thanks,
Elyse

From: Lisa Ramos [mailto:lramos1@aqmd.gov]
Sent: Wednesday, October 28, 2015 9:34 AM
To: Engel, Elyse/SJC <Elyse.Engel@ch2m.com>
Cc: OB PR Support Docs <ob_pr_support_docs@aqmd.gov>
Subject: RE: SCAQMD PRR #81979

Elyse,
This request is still in the processing phase. I forwarded your email to the appropriate contacts.

Lisa Ramos
South Coast A.Q.M.D
Public Records Unit
909.396.3211

From: Elyse.Engel@ch2m.com [mailto:Elyse.Engel@ch2m.com]
Sent: Thursday, October 22, 2015 10:04 AM
To: Lisa Ramos
Cc: OB PR Support NA Docs
Subject: SCAQMD PRR #81979

Hi Lisa,

I wanted to follow-up on the status of Public Records Request #81979. This request was initially filed by Beth Smoker on June 18, 2015. On July 10, 2015, Beth requested that you switch the e-mail address associated with this request from hers (beth.smoker@ch2m.com) to mine (elyse.engel@ch2m.com). I have not received any notifications from the SCAQMD regarding this request since July 10th. Therefore, to my knowledge, this request is still outstanding and we are still waiting on receipt of the requested information. Please let me know when we may expect to receive the requested information.

Thanks,
Elyse

Elyse Engel, EIT
Associate Engineer
D 1 669 800 1012
elyse.engel@ch2m.com

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1737 North First Street, Suite 300
San Jose, California 95112
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Attachment A11-1
Revised Air Quality and Public Health Impacts for the Amended Huntington Beach Energy Project

Revised Air Quality and Public Health Impacts for the Amended Huntington Beach Energy Project

Contents

Figure

SECTION 1

Introduction

The following sections describe and evaluate the potential air quality and public health effects of the Amended Huntington Beach Energy Project (HBEP), as revised in response to the California Energy Commission's (CEC) Data Request Set #1 (TN#206618). Section 2 presents the emission estimates for the facility. Section 3 presents the potential air quality impacts associated with the demolition and construction, commissioning, and operation of the Amended HBEP. Section 4 presents the potential public health impacts associated with demolition and construction and operation of the Amended HBEP. Section 5 contains the references used to prepare this document.

SECTION 2

Emissions

Emissions from demolition of existing structures and construction of the new electrical generating components, commissioning of the new gas turbines, and operation of the new gas turbines and auxiliary boiler will consist of oxides of nitrogen (NO_X), carbon monoxide (CO), volatile organic compounds (VOC), sulfur dioxide (SO_2), particulate matter with an aerodynamic diameter less than or equal to 10 microns (PM_{10}), particulate matter with an aerodynamic diameter less than or equal to 2.5 microns ($PM_{2.5}$), and greenhouse gases (GHGs). The GHGs evaluated include carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), and sulfur hexafluoride (SF_6), as applicable. Carbon dioxide equivalent (CO_2e) emissions were also determined, using the following global warming potentials (GWPs): 25 for CH_4, 298 for N_2O, and 22,800 for SF_6 (The Climate Registry, 2015). Emissions of air toxics were also evaluated for operation of the new gas turbines and auxiliary boiler. Unless otherwise noted below, emissions were calculated for each phase consistent with the methodology presented in Section 5.1.5.1 of the HBEP Petition to Amend (PTA).

2.1 Demolition and Construction

Consistent with Section 5.1.5.1 of the HBEP PTA, the maximum daily demolition/construction emissions occur during month 30 for VOC, CO, NO_X, and SO_2, and during month 32 for PM_{10} and $PM_{2.5}$. The maximum annual demolition/construction emissions vary by pollutant, occurring between months 26 and 37 for VOC, CO, SO_2, PM_{10}, and $PM_{2.5}$, and between months 25 and 36 for NO_X.[1] The maximum daily and annual emissions from the combined onsite and offsite demolition and construction activities are presented in Table 2-1, which is identical to Table 5.1-4 of the HBEP PTA. Detailed calculations are provided in Appendix 5.1A of the HBEP PTA.

TABLE 2-1
Maximum Daily and Annual Emissions from Demolition and Construction [a]

Demolition and Construction Emissions	VOC	CO	NO_X	SO_2	PM_{10}	$PM_{2.5}$
Maximum Daily Emissions (lb/day)	8.80	116	189	0.78	29.1	10.0
Maximum Annual Emissions (tpy)	0.98	14.9	20.1	0.087	3.33	1.13

[a] Maximum daily and annual emissions include contributions from onsite construction equipment, offsite construction equipment, onsite vehicles, and offsite vehicles. The PM_{10} and $PM_{2.5}$ emissions include exhaust and fugitive dust emissions.

Notes:
lb/day = pound(s) per day
tpy = ton(s) per year

The maximum annual GHG emissions from demolition and construction activities are presented in Table 2-2, which is identical to Table 5.1-5 of the HBEP PTA. As with the criteria pollutants, the maximum annual GHG emissions occur during construction of the combined-cycle power block. No significant emissions of SF_6 are expected during demolition and construction. Detailed calculations are provided in Appendix 5.1A of the HBEP PTA.

[1] Construction of the combined-cycle power block occurs during months 18 through 52. These activities contribute to the maximum daily and annual demolition/construction emissions.

TABLE 2-2
Maximum Annual Greenhouse Gas Emissions from Demolition and Construction

Demolition and Construction Emissions	CO_2	CH_4	N_2O	CO_2e
Total (MT/yr)	8,289	0.13	0.063	8,311

Note:
MT/year = metric ton(s) per year

Estimated total fuel use during demolition and construction would be 1,458,865 gallons of diesel and 268,265 gallons of gasoline. Detailed calculations are provided in Appendix 5.1A of the HBEP PTA.

Table 2-3 summarizes the total diesel particulate matter (DPM) exhaust emissions from demolition and construction activities, which serve as the basis for evaluating health risks in the project vicinity during the demolition and construction period. This is identical to Table 5.9-1 of the HBEP PTA and detailed calculations can be found in Appendix 5.1A of the HBEP PTA.

TABLE 2-3
DPM Emissions from Demolition and Construction

	DPM Exhaust Emissions	
Demolition and Construction Areas	Total (lb/project)	Annualized (lb/yr) [a]
East	136	13.6
West	28.1	2.80
South	51.3	5.13

[a] Annualized emissions were calculated by averaging the total emissions over the entire demolition and construction period.

Note:
lb/project = pound(s) per project
lb/yr = pound(s) per year

2.2 Commissioning

Commissioning is a one-time event which occurs following installation and just prior to bringing the equipment online for commercial operation. The commissioning emissions are based on the estimated duration of each commissioning event, emission control efficiencies expected for each event, and turbine operating rates. The commissioning phase for each turbine type is described in more detail below.

Combined-cycle Turbines. The total duration of the combined-cycle power block commissioning period is expected to be up to 1,992 hours (996 hours per combustion turbine generator [CTG]). During the commissioning period, each General Electric (GE) Frame 7FA.05 will be operated for up to 216 hours without emission control systems in operation. The maximum hourly and event commissioning emission rates for the GE Frame 7FA.05s are presented in Table 2-4, which is a revision to Table 5.1-6 of the HBEP PTA. Because commissioning is expected to be completed within 1,992 hours, annual impacts for the combined commissioning and operation of the combined-cycle power block were also evaluated since annual emissions during the commissioning year could be higher than those during a noncommissioning year. Therefore, the annual average emission rates associated with commissioning and operation of the GE Frame 7FA.05s are also presented in Table 2-4. Detailed calculations are provided in Appendix 5.1B of the HBEP PTA, which has been revised and included with this submission on compact disc.

TABLE 2-4

GE Frame 7FA.05 Turbine Commissioning Emission Rates

Commissioning Emissions	VOC	CO	NO_X	SO_2	PM_{10}	$PM_{2.5}$
Short-Term Emission Rates						
Maximum Hourly, lb/hr (per turbine) [a]	270	1,900	130	4.86	8.50	8.50
Total Commissioning Period, tons (per 2x1 block) [b]	14.7	101	27.6	4.84	8.47	8.47
Annual Emission Rates						
Annual Average Hourly, lb/hr (per turbine) [c]	N/A	N/A	16.1	N/A	7.38	7.38
Total Commissioning/Operation Period, tons (per 2x1 block) [d]	N/A	N/A	141	N/A	64.7	64.7

[a] SO_2, PM_{10}, and $PM_{2.5}$ emissions are not emitted in amounts greater than normal operating rates.

[b] Total commissioning period SO_2, PM_{10}, and $PM_{2.5}$ emissions are based on the maximum emission rates at 32 degrees Fahrenheit (°F; see Appendix 5.1B of the HBEP PTA) multiplied by the total number of commissioning hours.

[c] Annual average hourly emissions for evaluating annual impacts are based on the sum of total commissioning emissions and annual operation emissions per turbine, divided by 8,760.

[d] Total commissioning/operation period emissions are based on the total commissioning period emissions presented here and the annual average operation emission rates at 65.8°F and 100 percent load (see Appendix 5.1B of the HBEP PTA).

Note:
N/A = not applicable (i.e., no annual average ambient air quality standard exists for these pollutants; therefore, annual average emissions were not modeled)

Simple-cycle Turbines. The total duration of the simple-cycle power block commissioning period is expected to be up to 560 hours (280 hours per turbine). During the commissioning period, each GE LMS 100PB will be operated for up to 4 hours without emission control systems in operation. The maximum hourly and event commissioning emission rates for the GE LMS 100PBs are presented in Table 2-5, which is a revision to Table 5.1-7 of the HBEP PTA. Because commissioning is expected to be completed within 560 hours, annual impacts for the combined commissioning and operation of the simple-cycle power block were also evaluated since annual emissions during the commissioning year could be higher than those during a noncommissioning year. Therefore, the annual average emission rates associated with commissioning and subsequent operation of the GE LMS 100PBs are also presented in Table 2-5. Detailed calculations are provided in Appendix 5.1B, which has been revised and included with this submission on compact disc.

TABLE 2-5

GE LMS 100PB Turbine Commissioning Emission Rates

Commissioning Emissions	VOC	CO	NO_X	SO_2	PM_{10}	$PM_{2.5}$
Short-Term Emission Rates						
Maximum Hourly, lb/hr (per turbine) [a]	5.08	244	40.1	1.64	6.24	6.24
Total Commissioning Period, tons (per 2-turbine block) [b]	0.84	25.4	5.72	0.46	1.75	1.75
Annual Emission Rates						
Annual Average Hourly, lb/hr (per turbine) [c]	N/A	N/A	3.10	N/A	1.63	1.63
Total Commissioning/Operation Period, tons (per 2-turbine block) [d]	N/A	N/A	27.1	N/A	14.2	14.2

[a] SO_2, PM_{10}, and $PM_{2.5}$ emissions are not emitted in amounts greater than normal operating rates.

[b] Total commissioning period SO_2, PM_{10}, and $PM_{2.5}$ emissions are based on the maximum emission rates at 65.8°F (see Appendix 5.1B of the HBEP PTA) multiplied by the total number of commissioning hours.

[c] Annual average hourly emissions for evaluating annual impacts are based on the sum of total commissioning emissions and annual operation emissions per turbine, divided by 8,760.

TABLE 2-5
GE LMS 100PB Turbine Commissioning Emission Rates

Commissioning Emissions	VOC	CO	NO_X	SO_2	PM_{10}	$PM_{2.5}$

[d] Total commissioning/operation period emissions are based on the total commissioning period emissions presented here and the annual average operation emission rates at 65.8°F and 100 percent load (see Appendix 5.1B of the HBEP PTA).

Note:
N/A = not applicable (i.e., no annual average ambient air quality standard exists for these pollutants; therefore, annual average emissions were not modeled)

2.3 Operation

Operation emissions were calculated for three basic operational modes, as follows:

- Startup, which occurs each time the gas turbine or auxiliary boiler is started
- Normal operation
- Shutdown, which occurs each time the gas turbine is shut down

2.3.1 Operating Schedule

AES has proposed the operating schedule for the Amended HBEP shown in Table 2-6 on a per turbine basis.

TABLE 2-6
Operating Schedule

	GE Frame 7FA.05		GE LMS 100PB	
Parameter	**Events**	**Hours**	**Events**	**Hours**
Annual Hours	--	6,100	--	1,750
Annual Cold Startup	24	24.0	0	--
Annual Warm Startup	100	50.0	0	--
Annual Hot Startup	376	188	350	175
Annual Shutdown	500	250	350	75.8
Total Annual Startup/ Shutdown Hours (per turbine)	--	512	--	251
Total Annual Operating Hours (per turbine)	--	6,612	--	2,001
Monthly Cold Startup	2	2.00	0	--
Monthly Warm Startup	15	7.50	0	--
Monthly Hot Startup	45	22.5	62	31.0
Monthly Shutdown	62	31.0	62	13.4
Total Monthly Startup/ Shutdown Hours (per turbine)	--	63.0	--	44.4
Monthly Operating Hours (per turbine)	--	681	--	700

The auxiliary boiler may operate 365 days per year with 24 cold starts, 48 warm starts, and 48 hot starts. Monthly operation assumes 2 cold starts, 4 warm starts, 4 hot starts, and 26,327 million British thermal units (MMBtu) per month of fuel consumption.

2.3.2 Hourly Emissions

The maximum hourly emissions for normal operation, startups, and shutdowns are presented in Tables 2-7 through 2-10 for each combustion technology. Table 2-8 is a revision to Table 5.1-8 of the HBEP PTA, Table 2-9 is a revision to Table 5.1-10 of the HBEP PTA, and Table 2-10 is a revision to Table 5.1-12 of the HBEP PTA. Detailed calculations are provided in Appendix 5.1B of the HBEP PTA, which has been revised and included with this submission on compact disc.

TABLE 2-7
Maximum Hourly Emissions for Normal Operation (1 Turbine)

	Emissions (lb/hr)			
Pollutant	**Uncontrolled GE Frame 7FA.05 [a]**	**Uncontrolled GE LMS 100PB [b]**	**Controlled GE Frame 7FA.05**	**Controlled GE LMS 100PB**
NO_X	59.3	82.9	16.5	8.29
CO	35.2	202	10.0	8.07
VOC	1.58	4.62	5.75	2.31
PM_{10}	9.0	6.24	8.50	6.24
SO_2	4.86	1.64	4.86	1.64
Ammonia	/////////	/////////	15.3	6.14

[a] Uncontrolled emission rates based on dry-low NO_X (DLN) without selective catalytic reduction (SCR), NO_X = 9 part(s) per million (ppm) and CO = 7.07 ppm.

[b] Uncontrolled emission rates based on DLN without SCR, NO_X = 25 ppm, CO = 100 ppm, and VOC = 4 ppm.

TABLE 2-8
Maximum Hourly and Total Emissions for Startups and Shutdowns (1 GE Frame 7FA.05 Turbine)

	Cold Start, 60 minutes		Warm Start, 30 minutes		Hot Start, 30 minutes		Shutdown, 30 minutes	
Pollutant	**lb/hr [b]**	**lb/event**	**lb/hr [b]**	**lb/event**	**lb/hr [b]**	**lb/event**	**lb/hr [b]**	**lb/event**
NO_X [a]	61.0	61.0	25.2	17.0	25.2	17.0	18.2	10.0
CO [a]	325	325	142	137	142	137	138	133
VOC [a]	36.0	36.0	27.9	25.0	27.9	25.0	34.9	32.0
PM_{10}	8.50	8.50	8.50	4.25	8.50	4.25	8.50	4.25
SO_2	4.86	4.86	4.86	2.43	4.86	2.43	4.86	2.43

[a] The NO_X, CO, and VOC emissions in this table are as reported by AES.

[b] The lb/hr numbers represent the highest hour during the event.

Note:
lb/event = pound(s) per event

TABLE 2-9
Maximum Hourly and Total Emissions for Startups and Shutdowns (1 GE LMS 100PB Turbine)

	Start, 30 minutes		Shutdown, 13 minutes	
Pollutant	**lb/hr [b]**	**lb/event**	**lb/hr [b]**	**lb/event**
NO_X [a]	20.7	16.6	9.61	3.12
CO [a]	19.4	15.4	34.4	28.1
VOC [a]	3.96	2.80	4.87	3.06
PM_{10}	6.24	3.12	6.24	3.12

TABLE 2-9
Maximum Hourly and Total Emissions for Startups and Shutdowns (1 GE LMS 100PB Turbine)

	Start, 30 minutes		Shutdown, 13 minutes	
Pollutant	**lb/hr [b]**	**lb/event**	**lb/hr [b]**	**lb/event**
SO_2	1.64	0.82	1.64	0.82

[a] The NO_X, CO, and VOC emissions in this table are as reported by AES.
[b] The lb/hr numbers represent the highest hour during the event.

TABLE 2-10
Maximum Hourly and Total Emissions for Startups (Auxiliary Boiler)

	Cold Start, 170 minutes		Warm Start, 85 minutes		Hot Start, 25 minutes	
Pollutant	**lb/hr [b]**	**lb/event**	**lb/hr [b]**	**lb/event**	**lb/hr [b]**	**lb/event**
NO_X [a]	1.49	4.22	1.49	2.11	0.87	0.62
CO [a]	1.53	4.34	1.53	2.17	2.29	0.64
VOC [a]	1.65	4.69	1.65	2.34	0.85	0.69
PM_{10}	0.30	0.85	0.30	0.43	0.30	0.13
SO_2	0.048	0.14	0.048	0.068	0.048	0.020

[a] The NO_X, CO, and VOC emissions in this table are as reported by AES.
[b] The lb/hr numbers represent the highest hour during the event.

2.3.3 Monthly and Daily Emissions

The monthly operating schedules for the combined-cycle and simple-cycle CTGs are presented in Tables 2-11 and 2-12, respectively.

TABLE 2-11
Monthly Operating Schedule (GE Frame 7FA.05 Turbine)

Parameter	Number	Hours
Monthly Cold Starts	2	2.00
Monthly Warm Starts	15	7.50
Monthly Hot Starts	45	22.5
Monthly Shutdowns	62	31.0
Total Monthly Startup and Shutdown Hours	N/A	63.0
Total Monthly Operating Hours (not including startups and shutdowns)	N/A	681

Note:
N/A = not applicable

TABLE 2-12
Monthly Operating Schedule (GE LMS 100PB Turbine)

Parameter	Number	Hours
Monthly Starts	62	31.0
Monthly Shutdowns	62	13.4
Total Monthly Startup and Shutdown Hours	N/A	44.4
Total Monthly Operating Hours (not including startups and shutdowns)	N/A	700

Note:
N/A = not applicable

The maximum monthly and average daily emissions are presented in Tables 2-13 and 2-14 for the combined-cycle and simple-cycle CTGs, respectively. Detailed calculations are provided in Appendix 5.1B of the HBEP PTA, which has been revised and included with this submission on compact disc.

As shown in Table 2-13, daily emissions are calculated as the monthly emissions divided by 30, based on the monthly operating schedule in Table 2-11.

TABLE 2-13
Maximum Monthly and Average Daily Emissions (GE Frame 7FA.05 Turbine)

Pollutant	Maximum Monthly Emissions (lb/month)	Average Daily Emissions (lb/day)
NO_X	25,587	853
CO	43,895	1,463
VOC	14,524	484
SO_2	2,385	79.5
PM_{10}	12,648	422
$PM_{2.5}$	12,648	422

Note:
lb/month = pound(s) per month

As shown in Table 2-14, daily emissions are calculated as the monthly emissions divided by 30, based on the monthly operating schedule in Table 2-12.

TABLE 2-14
Maximum Monthly and Average Daily Emissions (GE LMS 100PB Turbine)

Pollutant	Maximum Monthly Emissions (lb/month)	Average Daily Emissions (lb/day)
NO_X	14,039	468
CO	16,689	556
VOC	3,961	132
SO_2	812	27.1
PM_{10}	9,288	310
$PM_{2.5}$	9,288	310

Table 2-15 summarizes the auxiliary boiler maximum hourly, daily, and annual emission estimates. Detailed calculations are provided in Appendix 5.1B of the HBEP PTA, which has been revised and included with this submission on compact disc.

TABLE 2-15
Auxiliary Boiler Maximum Hourly, Daily, and Annual Emission Estimates

Period	NO_X	CO	VOC	SO_2	PM_{10}	$PM_{2.5}$	Fuel Use (MMBtu)
Hourly Emissions (lb/hr) [a]	0.42	2.83	0.28	0.048	0.30	0.30	70.8
Daily Emissions (lb/day) [b]	5.80	35.0	4.16	0.60	3.77	3.77	878
Monthly Emissions (lb/month) [c]	174	1,051	125	17.9	113	113	26,327
Annual Emissions (lb/year) [d]	2,054	12,384	1,473	211	1,333	1,333	310,096
Annual Emissions (tpy) [d]	1.03	6.19	0.74	0.11	0.67	0.67	--

[a] Hourly emissions are based on the maximum hourly firing rate.

[b] Daily emissions are the monthly emissions averaged over 30 days.

[c] Monthly emissions assume two cold starts, four warm starts, four hot starts, and 26,327 MMBtu of fuel consumption per month.

[d] Annual emissions assume 24 cold starts, 48 warm starts, 48 hot starts, and 310,096 MMBtu of fuel consumption per year.

2.3.4 Annual Emissions

Table 2-16 summarizes the annual criteria pollutant emissions for each combustion technology. Detailed calculations are provided in Appendix 5.1B of the HBEP PTA, which has been revised and included with this submission on compact disc.

TABLE 2-16
Annual Criteria Pollutant Emissions

	Annual Emissions per Unit (tpy)			Annual Emissions per Combustion Technology (tpy)*		
Pollutant	GE Frame 7FA.05	GE LMS 100PB	Auxiliary Boiler	GE Frame 7FA.05	GE LMS 100PB	Auxiliary Boiler
NO_X	56.7	10.7	1.03	113	21.4	1.03
CO	92.2	14.7	6.19	184	29.4	6.19
VOC	31.1	3.05	0.74	62.1	6.10	0.74
SO_2	5.30	0.55	0.11	10.6	1.09	0.11
PM_{10}	28.1	6.24	0.67	56.2	12.5	0.67
$PM_{2.5}$	28.1	6.24	0.67	56.2	12.5	0.67

*Accounts for 2 GE Frame 7FA.05 turbines, 2 GE LMS 100PB turbines, and one auxiliary boiler.

Table 2-17 summarizes the annual GHG emissions for the facility, which is a revision to Table 5.1-16 of the HBEP PTA. Detailed calculations are provided in Appendix 5.1B of the HBEP PTA, which has been revised and included with this submission on compact disc.

TABLE 2-17
Annual GHG Emissions

	CO_2	CH_4	N_2O	CO_2e [a]
Amended HBEP, MT/yr	1,776,830	42.0	88.4	1,804,233

[a] Value includes SF_6 emissions associated with 10 circuit breakers with an assumed annual leak rate of 0.1 percent (see Appendix 5.1B, Table 5.1B.17 of the HBEP PTA).

Table 2-18 summarizes the hourly and annual toxic emissions for the combined-cycle CTGs. Detailed calculations are provided in Appendix 5.1B of the HBEP PTA, which has been revised and included with this submission on compact disc.

TABLE 2-18
Combined-cycle: Summary of Operation Emissions – Air Toxics

Compound	Emission Factors		Emissions (per Turbine)			Emissions (Facility Total)		
	lb/MMcf [a]	lb/MMBtu [a]	lb/hr [b]	lb/yr [c]	tpy	lb/hr	lb/yr	tpy
Ammonia [d]	5 ppm	--	15.2	100,290	50.1	30.5	200,580	100
1,3-Butadiene	4.39E-04	4.18E-07	0.0010	6.21	0.0031	0.0019	12.4	0.0062
Acetaldehyde [e]	1.80E-01	1.71E-04	0.39	2,548	1.27	0.78	5,096	2.55
Acrolein [e]	3.69E-03	3.51E-06	0.0080	52.2	0.026	0.016	104	0.052
Benzene [e]	3.33E-03	3.17E-06	0.0072	47.1	0.024	0.014	94.3	0.047
Ethylbenzene	3.26E-02	3.10E-05	0.071	462	0.23	0.14	923	0.46
Formaldehyde [e]	3.67E-01	3.50E-04	0.79	5,196	2.60	1.59	10,391	5.20
Naphthalene	1.33E-03	1.27E-06	0.0029	18.8	0.0094	0.0058	37.7	0.019
PAHs [f]	9.18E-04	8.74E-07	0.0010	6.50	0.0032	0.0020	13.0	0.0065
Propylene Oxide	2.96E-02	2.82E-05	0.064	419	0.21	0.13	838	0.42
Toluene	1.33E-01	1.27E-04	0.29	1,883	0.94	0.58	3,766	1.88
Xylene	6.53E-02	6.22E-05	0.14	924	0.46	0.28	1,849	0.92
TOTAL HAPs				**11,563**	**5.78**		**23,125**	**11.6**
TOTAL TACs				**5,249**	**2.62**		**10,498**	**5.25**

[a] Provided by South Coast Air Quality Management District (SCAQMD) via e-mail correspondence on November 3, 2015, with the exception of ammonia. Units of lb/MMBtu calculated by dividing lb/MMcf by the gas heat content of 1,050 British thermal unit(s) per cubic foot (Btu/cf).

[b] Hourly per turbine emissions calculated by multiplying the emission factor by 2,273 million British thermal unit(s) per hour (MMBtu/hr), higher heating value (HHV).

[c] Annual per turbine emissions calculated by multiplying the emission factor by 2,248 MMBtu/hr, HHV and 6,612 hours/year.

[d] Based on the operating exhaust ammonia limit of 5 part(s) per million by volume, dry (ppmvd) @ 15% oxygen (O_2) and an F-factor of 8,710.

[e] Emission factors account for the use of an oxidation catalyst, as provided by SCAQMD via e-mail correspondence on November 3, 2015.

[f] Per Section 3.1.4.3 of *AP-42* (U.S. Environmental Protection Agency [EPA], 2000), PAH emissions were assumed to be controlled up to 50% through the use of an oxidation catalyst.

Notes:

HAP	=	hazardous air pollutant
lb/MMBtu	=	pound(s) per million British thermal unit
lb/MMcf	=	pound(s) per million cubic foot
PAH	=	polycyclic aromatic hydrocarbon
TAC	=	toxic air contaminant

Table 2-19 summarizes the hourly and annual toxic emissions for the simple-cycle CTGs. Detailed calculations are provided in Appendix 5.1B of the HBEP PTA, which has been revised and included with this submission on compact disc.

TABLE 2-19
Simple-cycle: Summary of Operation Emissions – Air Toxics

	Emission Factors		Emissions (per Turbine)			Emissions (Facility Total)		
Compound	**lb/MMcf [a]**	**lb/MMBtu [a]**	**lb/hr [b]**	**lb/yr [c]**	**tpy**	**lb/hr**	**lb/yr**	**tpy**
Ammonia [d]	5 ppm	--	6.14	12,277	6.14	12.3	24,553	12.3
1,3-Butadiene	4.39E-04	4.18E-07	0.00037	0.74	0.00037	0.00074	1.48	0.00074
Acetaldehyde [e]	1.80E-01	1.71E-04	0.15	304	0.15	0.30	607	0.30
Acrolein [e]	3.69E-03	3.51E-06	0.0031	6.22	0.0031	0.0062	12.4	0.0062
Benzene [e]	3.33E-03	3.17E-06	0.0028	5.62	0.0028	0.0056	11.2	0.0056
Ethylbenzene	3.26E-02	3.10E-05	0.027	55.0	0.027	0.055	110	0.055
Formaldehyde [e]	3.67E-01	3.50E-04	0.31	619	0.31	0.62	1,238	0.62
Naphthalene	1.33E-03	1.27E-06	0.0011	2.24	0.0011	0.0022	4.49	0.0022
PAHs [f]	9.18E-04	8.74E-07	0.00039	0.77	0.00039	0.00077	1.55	0.00077
Propylene Oxide	2.96E-02	2.82E-05	0.025	49.9	0.025	0.050	100	0.050
Toluene	1.33E-01	1.27E-04	0.11	224	0.11	0.22	449	0.22
Xylene	6.53E-02	6.22E-05	0.055	110	0.055	0.11	220	0.11
TOTAL HAPs				**1,378**	**0.69**		**2,756**	**1.38**
TOTAL TACs				**625**	**0.31**		**1,251**	**0.63**

[a] Provided by SCAQMD via e-mail correspondence on November 3, 2015, with the exception of ammonia. Units of lb/MMBtu calculated by dividing lb/MMcf by the gas heat content of 1,050 Btu/cf.

[b] Hourly per turbine emissions calculated by multiplying the emission factor by 885 MMBtu/hr, HHV.

[c] Annual per turbine emissions calculated by multiplying the emission factor by 885 MMBtu/hr, HHV and 2,001 hours/year.

[d] Based on the operating exhaust ammonia limit of 5 ppmvd @ 15% O_2 and an F-factor of 8,710.

[e] Emission factors account for the use of an oxidation catalyst, as provided by SCAQMD via e-mail correspondence on November 3, 2015.

[f] Per Section 3.1.4.3 of *AP-42* (EPA, 2000), PAH emissions were assumed to be controlled up to 50% through the use of an oxidation catalyst.

Table 2-20 summarizes the hourly and annual toxic emissions for the auxiliary boiler, and is a revision to Table 5.9-3 of the HBEP PTA. Detailed calculations are provided in Appendix 5.1B of the HBEP PTA, which has been revised and included with this submission on compact disc.

TABLE 2-20
Auxiliary Boiler: Summary of Operation Emissions – Air Toxics

	Emission Factors		Emissions		
Compound	**lb/MMcf [a]**	**lb/MMBtu [a]**	**lb/hr [b]**	**lb/yr [c]**	**tpy**
Benzene	5.80E-03	5.52E-06	3.91E-04	1.71E+00	8.56E-04
Formaldehyde	1.23E-02	1.17E-05	8.29E-04	3.63E+00	1.82E-03
PAHs	1.00E-04	9.52E-08	6.74E-06	2.95E-02	1.48E-05
Naphthalene	3.00E-04	2.86E-07	2.02E-05	8.86E-02	4.43E-05
Acetaldehyde	3.10E-03	2.95E-06	2.09E-04	9.16E-01	4.58E-04
Acrolein	2.70E-03	2.57E-06	1.82E-04	7.97E-01	3.99E-04
Toluene	2.65E-02	2.52E-05	1.79E-03	7.83E+00	3.91E-03

TABLE 2-20
Auxiliary Boiler: Summary of Operation Emissions – Air Toxics

Compound	Emission Factors		Emissions		
	lb/MMcf [a]	lb/MMBtu [a]	lb/hr [b]	lb/yr [c]	tpy
Xylene	1.97E-02	1.88E-05	1.33E-03	5.82E+00	2.91E-03
Ethylbenzene	6.90E-03	6.57E-06	4.65E-04	2.04E+00	1.02E-03
Hexane	4.60E-03	4.38E-06	3.10E-04	1.36E+00	6.79E-04
TOTAL HAPs				**24.2**	**0.012**
TOTAL TACs				**6.70**	**0.0034**

[a] Provided by SCAQMD via e-mail correspondence on November 3, 2015. Units of lb/MMBtu calculated by dividing lb/MMcf by the gas heat content of 1,050 Btu/cf.

[b] Hourly emissions calculated by multiplying the emission factor by 71 MMBtu/hr, HHV.

[c] Annual emissions calculated by multiplying the emission factor by 310,096 MMBtu/year, HHV, which accounts for the auxiliary boiler operating at the maximum hourly firing rate with two cold starts, four warm starts, and four hot starts per month.

SECTION 3

Air Quality Impacts Analysis

An air quality impacts analysis was conducted to compare worst-case ground-level impacts resulting from the Amended HBEP with established state and federal ambient air quality standards and applicable South Coast Air Quality Management District (SCAQMD) significance criteria. The analysis was performed consistent with the methodology in Section 5.1.5.2 of the HBEP PTA, except that the newest versions of AERMET (version 15181) and AERMOD (version 15181) were used.[2] The stack parameters, emission rates, and results for each modeled scenario are described below, as related to demolition and construction, commissioning, and operation of the combined-cycle CTGs, simple-cycle CTGs, and auxiliary boiler.

3.1 Demolition and Construction Impacts Analysis

Table 3-1, which is identical to Table 5.1-19 of the HBEP PTA, presents the maximum daily emissions from the demolition and construction activities compared to the SCAQMD *CEQA Air Quality Handbook* significance thresholds (SCAQMD, 2015a). As indicated, the daily emissions associated with demolition and construction activities are expected to be less than significant, with the exception of NO_X.

TABLE 3-1
Maximum Daily Emissions from Demolition and Construction [a]

Demolition and Construction Emissions	VOC	CO	NO_X	SO_2	PM_{10}	$PM_{2.5}$
Maximum Daily Emissions (lb/day)	8.80	116	189	0.78	29.1	10.0
SCAQMD CEQA Significance Thresholds (lb/day)	75	550	100	150	150	55
Exceed Threshold? (Yes or No)	No	No	Yes	No	No	No

[a] Maximum daily emissions include contributions from onsite construction equipment, offsite construction equipment, onsite vehicles, and offsite vehicles. The PM_{10} and $PM_{2.5}$ emissions include exhaust and fugitive dust emissions.

Potential ambient air quality impacts for demolition and construction activities were also evaluated for only onsite activities. The emissions scenarios modeled were selected based on the demolition and construction activities that would emit the greatest quantity of each pollutant, as listed below:

- For 1-hour NO_2, the worst-case emissions occurred in Month 39, during combined-cycle power block construction
- For 1-hour and 8-hour CO and 1-hour, 3-hour, and 24-hour SO_2, the worst-case emissions occurred in Month 27, during combined-cycle power block construction
- For 24-hour PM_{10} and 24-hour $PM_{2.5}$, the worst-case emissions occurred in Month 16, during preparation of the Plains Tank Farm area
- For annual NO_2, the worst-case emissions occurred between Months 36 and 47, during combined-cycle power block construction
- For annual PM_{10} and annual $PM_{2.5}$, the worst-case emissions occurred between Months 27 and 38, during combined-cycle power block construction

The parameters for each area and point source included in the modeled scenarios are presented in Appendix A, Table 1. Parameters presented include source coordinates, elevation, release height, and vertical dimension for area sources and source coordinates, elevation, stack height, temperature, exit velocity, and stack diameter for point sources.

[2] Note that use of the latest version of AERMET (version 15181) required reprocessing of the meteorological data, including the latest version of AERMINUTE (version 15272), per the methodology contained in Section 4.2.3 of the *Dispersion Modeling Protocol for the Amended Huntington Beach Energy Project* (see Appendix 5.1F of the HBEP PTA).

The short-term and annual emission rates (in gram(s) per second [g/s] and pound(s) per hour [lb/hr]) for each source included in the modeled scenarios are presented in Appendix A, Table 2. These emission rates are the highest emissions expected during demolition and construction, as discussed previously.

The results for each modeled scenario are presented in Appendix A, Table 3. As with the emission rates, these results are sorted by short-term and annual averaging periods. These results were used to identify the maximum impacts provided below.

Table 3-2 presents the results of the demolition and construction impacts analysis, and is identical to Table 5.1-20 of the HBEP PTA. As indicated, the maximum predicted CO, nitrogen dioxide (NO_2), SO_2, and $PM_{2.5}$ demolition and construction impacts combined with the background concentrations will be below the ambient air quality standards for each averaging period. For PM_{10}, the annual and 24-hour background concentrations exceed or equal more than 95 percent of the California Ambient Air Quality Standards (CAAQS) without adding the modeled concentrations. As a result, the predicted impacts combined with the background concentrations would be greater than the CAAQS. Based on the modeling analysis, fugitive dust is a significant contributor to the predicted concentration of PM_{10}. With the mitigation measures described in Section 5.1.7.1 of the HBEP PTA, impacts from demolition and construction will be less than significant.

TABLE 3-2
Maximum Modeled Impacts from Demolition and Construction and the Ambient Air Quality Standards

Pollutant	Averaging Time	Maximum Modeled Concentration, μg/m³	Background Concentration, μg/m³ [a]	Total Predicted Concentration, μg/m³	CAAQS, μg/m³	NAAQS, μg/m³
CO	1-hour	177	3,321	3,498	23,000	40,000
	8-hour	140	2,519	2,659	10,000	10,000
NO_2 [b]	1-hour (max)	27.0	142	169	339	—
	1-hour (98th percentile) [c]	—	—	121	—	188
	Annual	2.05	21.8	23.8	57	100
SO_2	1-hour (max)	0.30	20.2	20.5	655	—
	1-hour (99th percentile) [d]	0.29	8.80	9.09	—	196
	3-hour	0.28	20.2	20.5	—	1,300
	24-hour	0.059	5.20	5.26	105	—
PM_{10}	24-hour	11.1	51.0	62.1	50	150
	Annual	3.01	19.3	22.3	20	—
$PM_{2.5}$	24-hour (98th percentile) [e]	3.42	21.3	24.7	—	35
	Annual	0.85	8.60	9.45	12	12

[a] Background concentrations were the highest concentrations monitored during 2011 through 2013.

[b] The maximum 1-hour and annual NO_2 concentrations include ambient NO_2 ratios of 0.80 (EPA, 2011) and 0.75 (EPA, 2005), respectively.

[c] The total predicted concentration for the federal 1-hour NO_2 standard is the 5-year average, high-8th-high modeled concentration paired with 98th percentile seasonal hour-of-day background concentrations for 2010 through 2012.

[d] The total predicted concentration for the federal 1-hour SO_2 standard is the 5-year average, high-4th-high modeled concentration combined with the 3-year average, 99th percentile background concentration.

[e] The total predicted concentration for the federal 24-hour $PM_{2.5}$ standard is the 5-year average, high-8th-high modeled concentration combined with the 3-year average, 98th percentile background concentration.

Note:
μg/m³ = microgram(s) per cubic meter
NAAQS = National Ambient Air Quality Standards

With regards to GHG emissions, SCAQMD staff has recommended a GHG significance threshold that would apply to stationary source/industrial projects and would include direct and indirect emissions during construction and operation. Following the Tier 3 screening level approach, construction emissions would be amortized over the life of the project (defined as 30 years) and would be added to the operational emissions for comparison to the significance threshold of 10,000 metric tons (MT) of CO_2e.[3] Because the GHG Potential to Emit (PTE) emissions from operation of the Amended HBEP are expected to exceed 1,000,000 MT of CO_2e, the Amended HBEP would exceed the 10,000 MT of CO_2e limit. However, the Amended HBEP has been designed to incorporate energy-efficient technologies for reducing GHG PTE emissions from the power generation equipment; additionally, SCAQMD will define the Best Available Control Technology (BACT) for reducing GHG emissions as part of the Prevention of Significant Deterioration (PSD) permitting process. Therefore, for purposes of evaluating the potential GHG impacts associated with Amended HBEP demolition and construction activities, the demolition and construction GHG emissions in Table 2-2 were compared to the 10,000 MT of CO_2e threshold. Based on this comparison, the annual GHG emissions from demolition and construction activities before amortization would be less than 10,000 MT of CO_2e. As a result, the GHG emissions from demolition and construction activities are less than significant.

3.2 Commissioning Impacts Analysis

For commissioning, a total of 6 scenarios were modeled, as listed below:

- Two GE Frame 7FA.05s at 10 percent load with auxiliary boiler operation
- Two GE Frame 7FA.05s at 40 percent load with auxiliary boiler operation
- Two GE Frame 7FA.05s at 80 percent load with auxiliary boiler operation
- Two GE LMS 100PBs at 5 percent load with operation of two GE Frame 7FA.05s and the auxiliary boiler
- Two GE LMS 100PBs at 75 percent load with operation of two GE Frame 7FA.05s and the auxiliary boiler
- Two GE LMS 100PBs at 100 percent load with operation of two GE Frame 7FA.05s and the auxiliary boiler

The stack parameters for each unit included in the modeled scenarios are presented in Appendix B, Table 1. Stack parameters presented include source coordinates, elevation, stack height, temperature, exit velocity, and stack diameter.

The short-term and annual emission rates (in g/s and lb/hr) for each unit included in the modeled scenarios are presented in Appendix B, Table 2. These emission rates are the highest unabated emissions expected during commissioning. Only NO_2 and CO were modeled for the short-term averaging periods because SO_2, PM_{10}, and $PM_{2.5}$ are not emitted in amounts greater than normal operating rates. In other words, results for short-term SO_2, PM_{10}, and $PM_{2.5}$ were extracted from the operational modeling results, as discussed later within this response. Additionally, short-term modeling was only included for short-term NO_2 and CO for scenarios where the emission rates were not captured by another commissioning or operation scenario modeled. NO_2, PM_{10}, and $PM_{2.5}$ were modeled for annual averaging periods, and the emission rates account for operation following commissioning activities.

The building parameters included in the modeled scenarios are presented in Appendix B, Table 3. The building parameters for the three GE Frame 7FA.05 commissioning scenarios include the presence of existing Huntington Beach Generating Station (HBGS) Units 1, 2, 3, and 4 in addition to those of the GE Frame 7FA.05s. The building parameters for the three GE LMS 100PB commissioning scenarios include the presence of the two GE Frame 7FA.05s and existing HGBS Units 1 and 2, in addition to those of the GE LMS 100PBs.

The results for each modeled scenario are presented in Appendix B, Table 4. As with the emission rates, these results are sorted by short-term and annual averaging periods. As noted, impacts for the GE Frame 7FA.05 scenarios include operation of the auxiliary boiler; NO_2 was modeled using the plume volume molar ratio method (PVMRM). Impacts for the GE LMS 100PB scenarios include operation of the auxiliary boiler

[3] Information on thresholds is available online at http://www.aqmd.gov/home/regulations/ceqa/air-quality-analysis-handbook/ghg-significance-thresholds.

and two GE Frame 7FA.05s at the worst-case operating conditions, as discussed later within this response. These results were used to identify the maximum impacts provided below.

Table 3-3 presents the results of the GE Frame 7FA.05 commissioning impacts analysis, and is a revision to Table 5.1-21 of the HBEP PTA. As indicated, the maximum predicted CO, NO_2, SO_2, annual PM_{10}, and $PM_{2.5}$ commissioning impacts combined with the background concentrations will be below the ambient air quality standards for each averaging period. For PM_{10}, the 24-hour background concentration exceeds the CAAQS without adding the modeled concentration. As a result, the predicted impact combined with the background concentration would be greater than the CAAQS. However, the commissioning activity would be finite, and the Project Owner will limit the hours of operation required to complete commissioning activities. Additionally, as described in Section 5.1.7.3 of the HBEP PTA, Amended HBEP emissions will be fully offset consistent with SCAQMD Rule 1303 through the SCAQMD internal offset bank under SCAQMD Rule 1304(a)(2). Therefore, impacts from GE Frame 7FA.05 commissioning will be less than significant.

TABLE 3-3
GE Frame 7FA.05 Commissioning Impacts Analysis – Maximum Modeled Impacts Compared to the Ambient Air Quality Standards

Pollutant	Averaging Time	Maximum Modeled Concentration, μg/m³	Background Concentration, μg/m³ [a]	Total Predicted Concentration, μg/m³	CAAQS, μg/m³	NAAQS, μg/m³
CO	1-hour	4,341	3,321	7,662	23,000	40,000
	8-hour	3,000	2,519	5,519	10,000	10,000
NO_2	1-hour (max) [b]	169	142	311	339	—
	Annual [c]	0.66	21.8	22.5	57	100
SO_2	1-hour (max)	5.99	20.2	26.2	655	—
	3-hour	5.13	20.2	25.3	—	1,300
	24-hour	1.74	5.20	6.94	105	—
PM_{10}	24-hour	5.64	51.0	56.6	50	150
	Annual	0.57	19.3	19.9	20	—
$PM_{2.5}$	24-hour (98th percentile) [d]	3.33	21.3	24.6	—	35
	Annual	0.57	8.60	9.17	12	12

[a] Background concentrations were the highest concentrations monitored during 2011 through 2013.

[b] The maximum 1-hour NO_2 concentration is based on AERMOD PVMRM output with an in-stack NO_2 to NO_X ratio of 0.5 and an out-of-stack NO_2 to NO_X ratio of 0.9 (EPA, 2011; California Air Pollution Control Officer's Association [CAPCOA], 2011). Hourly paired ozone data is from the SCAQMD Costa Mesa monitoring station.

[c] The maximum annual NO_2 concentration includes an ambient NO_2 ratio of 0.75 (EPA, 2005).

[d] The total predicted concentration for the federal 24-hour $PM_{2.5}$ standard is the 5-year average, high-8th-high modeled concentration combined with the 3-year average, 98th percentile background concentration.

Table 3-4 presents the results of the GE LMS 100PB commissioning impacts analysis, and is a revision to Table 5.1-22 of the HBEP PTA. As indicated, the maximum predicted CO, NO_2, SO_2, annual PM_{10}, and $PM_{2.5}$ commissioning impacts combined with the background concentrations will be below the ambient air quality standards for each averaging period. For PM_{10}, the 24-hour background concentration exceeds the CAAQS without adding the modeled concentration. As a result, the predicted impact combined with the background concentration would be greater than the CAAQS. However, the commissioning activity would be finite, and the Project Owner will limit the hours of operation required to complete commissioning activities. Additionally, as described in Section 5.1.7.3 of the HBEP PTA, Amended HBEP emissions will be fully offset consistent with SCAQMD Rule 1303 through the SCAQMD internal offset bank under SCAQMD Rule 1304(a)(2). Therefore, impacts from GE LMS 100PB commissioning will be less than significant.

TABLE 3-4
GE LMS 100PB Commissioning Impacts Analysis – Maximum Modeled Impacts Compared to the Ambient Air Quality Standards

Pollutant	Averaging Time	Maximum Modeled Concentration, μg/m³	Background Concentration, μg/m³ [a]	Total Predicted Concentration, μg/m³	CAAQS, μg/m³	NAAQS, μg/m³
CO	1-hour	527	3,321	3,848	23,000	40,000
	8-hour	126	2,519	2,645	10,000	10,000
NO_2 [b]	1-hour (max)	79.1	142	221	339	—
	Annual	0.50	21.8	22.3	57	100
SO_2	1-hour (max)	5.76	20.2	26.0	655	—
	3-hour	5.01	20.2	25.2	—	1,300
	24-hour	1.66	5.20	6.86	105	—
PM_{10}	24-hour	5.11	51.0	56.1	50	150
	Annual	0.52	19.3	19.8	20	—
$PM_{2.5}$	24-hour (98th percentile) [c]	3.04	21.3	24.3	—	35
	Annual	0.52	8.60	9.12	12	12

[a] Background concentrations were the highest concentrations monitored during 2011 through 2013.
[b] The maximum 1-hour and annual NO_2 concentrations include ambient NO_2 ratios of 0.80 (EPA, 2011) and 0.75 (EPA, 2005), respectively.
[c] The total predicted concentration for the federal 24-hour $PM_{2.5}$ standard is the 5-year average, high-8th-high modeled concentration combined with the 3-year average, 98th percentile background concentration.

The commissioning activities associated with installation of the auxiliary boiler will occur prior to first fire of the combined-cycle CTG. Therefore, an independent assessment of the auxiliary boiler commissioning impacts was not performed. However, the auxiliary boiler emissions were included in each of the modeled commissioning scenarios as being in normal operation only.

3.3 Operation Impacts Analysis

To evaluate the worst-case air quality impacts, each technology was assessed at peak, average, and minimum load at low, average, and high ambient temperatures. This assessment, referred to as a load analysis, included a total of 41 modeled scenarios, as listed below:

- Operation of two GE Frame 7FA.05s at 100 percent load, two GE LMS 100PBs at 100 percent load, and the auxiliary boiler at an ambient temperature of 32 degrees Fahrenheit (°F)
- Operation of two GE Frame 7FA.05s at 100 percent load, two GE LMS 100PBs at 75 percent load, and the auxiliary boiler at an ambient temperature of 32°F
- Operation of two GE Frame 7FA.05s at 100 percent load, two GE LMS 100PBs at 50 percent load, and the auxiliary boiler at an ambient temperature of 32°F
- Operation of two GE Frame 7FA.05s at 75 percent load, two GE LMS 100PBs at 100 percent load, and the auxiliary boiler at an ambient temperature of 32°F
- Operation of two GE Frame 7FA.05s at 75 percent load, two GE LMS 100PBs at 75 percent load, and the auxiliary boiler at an ambient temperature of 32°F
- Operation of two GE Frame 7FA.05s at 75 percent load, two GE LMS 100PBs at 50 percent load, and the auxiliary boiler at an ambient temperature of 32°F
- Operation of two GE Frame 7FA.05s at 45 percent load, two GE LMS 100PBs at 100 percent load, and the auxiliary boiler at an ambient temperature of 32°F
- Operation of two GE Frame 7FA.05s at 45 percent load, two GE LMS 100PBs at 75 percent load, and the auxiliary boiler at an ambient temperature of 32°F

- Operation of two GE Frame 7FA.05s at 45 percent load, two GE LMS 100PBs at 50 percent load, and the auxiliary boiler at an ambient temperature of 32°F
- Operation of two GE Frame 7FA.05s at 100 percent load with evaporative cooling, two GE LMS 100PBs at 100 percent load with evaporative cooling, and the auxiliary boiler at an ambient temperature of 65.8°F
- Operation of two GE Frame 7FA.05s at 100 percent load with evaporative cooling, two GE LMS 100PBs at 100 percent load, and the auxiliary boiler at an ambient temperature of 65.8°F
- Operation of two GE Frame 7FA.05s at 100 percent load with evaporative cooling, two GE LMS 100PBs at 75 percent load, and the auxiliary boiler at an ambient temperature of 65.8°F
- Operation of two GE Frame 7FA.05s at 100 percent load with evaporative cooling, two GE LMS 100PBs at 50 percent load, and the auxiliary boiler at an ambient temperature of 65.8°F
- Operation of two GE Frame 7FA.05s at 100 percent load, two GE LMS 100PBs at 100 percent load with evaporative cooling, and the auxiliary boiler at an ambient temperature of 65.8°F
- Operation of two GE Frame 7FA.05s at 100 percent load, two GE LMS 100PBs at 100 percent load, and the auxiliary boiler at an ambient temperature of 65.8°F
- Operation of two GE Frame 7FA.05s at 100 percent load, two GE LMS 100PBs at 75 percent load, and the auxiliary boiler at an ambient temperature of 65.8°F
- Operation of two GE Frame 7FA.05s at 100 percent load, two GE LMS 100PBs at 50 percent load, and the auxiliary boiler at an ambient temperature of 65.8°F
- Operation of two GE Frame 7FA.05s at 75 percent load, two GE LMS 100PBs at 100 percent load with evaporative cooling, and the auxiliary boiler at an ambient temperature of 65.8°F
- Operation of two GE Frame 7FA.05s at 75 percent load, two GE LMS 100PBs at 100 percent load, and the auxiliary boiler at an ambient temperature of 65.8°F
- Operation of two GE Frame 7FA.05s at 75 percent load, two GE LMS 100PBs at 75 percent load, and the auxiliary boiler at an ambient temperature of 65.8°F
- Operation of two GE Frame 7FA.05s at 75 percent load, two GE LMS 100PBs at 50 percent load, and the auxiliary boiler at an ambient temperature of 65.8°F
- Operation of two GE Frame 7FA.05s at 44 percent load, two GE LMS 100PBs at 100 percent load with evaporative cooling, and the auxiliary boiler at an ambient temperature of 65.8°F
- Operation of two GE Frame 7FA.05s at 44 percent load, two GE LMS 100PBs at 100 percent load, and the auxiliary boiler at an ambient temperature of 65.8°F
- Operation of two GE Frame 7FA.05s at 44 percent load, two GE LMS 100PBs at 75 percent load, and the auxiliary boiler at an ambient temperature of 65.8°F
- Operation of two GE Frame 7FA.05s at 44 percent load, two GE LMS 100PBs at 50 percent load, and the auxiliary boiler at an ambient temperature of 65.8°F
- Operation of two GE Frame 7FA.05s at 100 percent load with evaporative cooling, two GE LMS 100PBs at 100 percent load with evaporative cooling, and the auxiliary boiler at an ambient temperature of 110°F
- Operation of two GE Frame 7FA.05s at 100 percent load with evaporative cooling, two GE LMS 100PBs at 100 percent load, and the auxiliary boiler at an ambient temperature of 110°F

- Operation of two GE Frame 7FA.05s at 100 percent load with evaporative cooling, two GE LMS 100PBs at 75 percent load, and the auxiliary boiler at an ambient temperature of 110°F
- Operation of two GE Frame 7FA.05s at 100 percent load with evaporative cooling, two GE LMS 100PBs at 50 percent load, and the auxiliary boiler at an ambient temperature of 110°F
- Operation of two GE Frame 7FA.05s at 100 percent load, two GE LMS 100PBs at 100 percent load with evaporative cooling, and the auxiliary boiler at an ambient temperature of 110°F
- Operation of two GE Frame 7FA.05s at 100 percent load, two GE LMS 100PBs at 100 percent load, and the auxiliary boiler at an ambient temperature of 110°F
- Operation of two GE Frame 7FA.05s at 100 percent load, two GE LMS 100PBs at 75 percent load, and the auxiliary boiler at an ambient temperature of 110°F
- Operation of two GE Frame 7FA.05s at 100 percent load, two GE LMS 100PBs at 50 percent load, and the auxiliary boiler at an ambient temperature of 110°F
- Operation of two GE Frame 7FA.05s at 75 percent load, two GE LMS 100PBs at 100 percent load with evaporative cooling, and the auxiliary boiler at an ambient temperature of 110°F
- Operation of two GE Frame 7FA.05s at 75 percent load, two GE LMS 100PBs at 100 percent load, and the auxiliary boiler at an ambient temperature of 110°F
- Operation of two GE Frame 7FA.05s at 75 percent load, two GE LMS 100PBs at 75 percent load, and the auxiliary boiler at an ambient temperature of 110°F
- Operation of two GE Frame 7FA.05s at 75 percent load, two GE LMS 100PBs at 50 percent load, and the auxiliary boiler at an ambient temperature of 110°F
- Operation of two GE Frame 7FA.05s at 48 percent load, two GE LMS 100PBs at 100 percent load with evaporative cooling, and the auxiliary boiler at an ambient temperature of 110°F
- Operation of two GE Frame 7FA.05s at 48 percent load, two GE LMS 100PBs at 100 percent load, and the auxiliary boiler at an ambient temperature of 110°F
- Operation of two GE Frame 7FA.05s at 48 percent load, two GE LMS 100PBs at 75 percent load, and the auxiliary boiler at an ambient temperature of 110°F
- Operation of two GE Frame 7FA.05s at 48 percent load, two GE LMS 100PBs at 50 percent load, and the auxiliary boiler at an ambient temperature of 110°F

The stack parameters for each unit included in the load analysis are presented in Appendix C, Table 1. Stack parameters presented include source coordinates, elevation, stack height, temperature, exit velocity, and stack diameter.

The short-term and annual emission rates (in g/s and lb/hr) for each unit included in the load analysis are presented in Appendix C, Table 2. As shown, only the exhaust scenarios with combustion turbines operating at an average annual ambient temperature of 65.8°F include annual emission rates. Generally, the emission rates are based on the following:

- Short-term SO_2 emission rates for the GE Frame 7FA.05s and GE LMS 100PBs are based on a maximum fuel sulfur content of 0.75 grain per 100 dry standard cubic feet of natural gas.
- Hourly CO and NO_2 emission rates for the GE Frame 7FA.05s are based on cold startup events.
- Hourly CO and NO_2 emission rates for the GE LMS 100PBs are based on one startup, one shutdown, and the balance of the hour at steady-state operation.
- 8-hour CO emission rates for the GE Frame 7FA.05s are based on one cold start, one warm start, two shutdowns, and the balance of the period at steady-state operation.

- 8-hour CO emission rates for the GE LMS 100PBs are based on two startups, two shutdowns, and the balance of the period at steady-state operation.
- Hourly emission rates for the auxiliary boiler are based on steady-state operation at 100 percent load.
- Annual emission rates for the GE Frame 7FA.05s are based on 24 cold startups, 100 warm startups, 376 hot startups, 500 shutdowns, and 6,100 hours of steady-state operation.
- Annual emission rates for the GE LMS 100PBs are based on 350 hot startups, 350 shutdowns, and 1,750 hours of steady-state operation.
- Annual emission rates for the auxiliary boiler are based on 12 startups per month and a monthly heat input of 26,327 MMBtu.

The building parameters included in the load analysis are presented in Appendix C, Table 3. The building parameters include the presence of existing HGBS Units 1 and 2 in addition to those of the GE Frame 7FA.05s and the GE LMS 100PBs.

The results for each scenario modeled through the load analysis are presented in Appendix C, Table 4. As with the emission rates, only the exhaust scenarios with CTGs operating at an average annual ambient temperature of 65.8°F include annual averaging period results. These results were used to identify the maximum impacts described below.

Table 3-5 presents the maximum Amended HBEP operational impacts, and is a revision to Table 5.1-23 of the HBEP PTA. As indicated, the maximum predicted CO, NO_2, SO_2, annual PM_{10}, and $PM_{2.5}$ operational impacts combined with the background concentrations will be below the ambient air quality standards for each averaging period. The 24-hour PM_{10} background concentration exceeds the CAAQS without adding the modeled concentration. As a result, the predicted impact combined with the background concentration will be greater than the CAAQS. However, as described in Section 5.1.7.3 of the HBEP PTA, Amended HBEP emissions will be fully offset consistent with SCAQMD Rule 1303 through the SCAQMD internal offset bank under SCAQMD Rule 1304(a)(2). Therefore, impacts from operation will be less than significant.

TABLE 3-5
Amended HBEP Operation Impacts Analysis – Maximum Modeled Impacts Compared to the Ambient Air Quality Standards

Pollutant	Averaging Time	Maximum Modeled Concentration, μg/m³	Background Concentration, μg/m³ [a]	Total Predicted Concentration, μg/m³	CAAQS, μg/m³	NAAQS, μg/m³
CO	1-hour	631	3,321	3,952	23,000	40,000
	8-hour	121	2,519	2,640	10,000	10,000
NO_2 [b]	1-hour (max)	95	142	237	339	—
	1-hour (98th percentile) [c]	—	—	126	—	188
	Annual	0.64	21.8	22.4	57	100
SO_2	1-hour (max)	5.76	20.2	26.0	655	—
	1-hour (99th percentile) [d]	4.86	8.80	13.7	—	196
	3-hour	5.01	20.2	25.2	—	1,300
	24-hour	1.66	5.20	6.86	105	365
PM_{10}	24-hour	5.11	51.0	56.1	50	150
	Annual	0.64	19.3	19.9	20	—
$PM_{2.5}$	24-hour (98th percentile) [e]	3.04	21.3	24.3	—	35
	Annual	0.64	8.60	9.24	12	12

[a] Background concentrations were the highest concentrations monitored during 2011 through 2013.

[b] The maximum 1-hour and annual NO_2 concentrations include ambient NO_2 ratios of 0.80 (EPA, 2011) and 0.75 (EPA, 2005), respectively.

[c] The total predicted concentration for the federal 1-hour NO_2 standard is the 5-year average, high-8th-high modeled concentration paired with 98th percentile seasonal hour-of-day background concentrations for 2010 through 2012.

TABLE 3-5
Amended HBEP Operation Impacts Analysis – Maximum Modeled Impacts Compared to the Ambient Air Quality Standards

Pollutant	Averaging Time	Maximum Modeled Concentration, μg/m³	Background Concentration, μg/m³ [a]	Total Predicted Concentration, μg/m³	CAAQS, μg/m³	NAAQS, μg/m³

[d] The total predicted concentration for the federal 1-hour SO_2 standard is the 5-year average, high-4th-high modeled concentration combined with the 3-year average, 99th percentile background concentration.

[e] The total predicted concentration for the federal 24-hour $PM_{2.5}$ standard is the 5-year average, high-8th-high modeled concentration combined with the 3-year average, 98th percentile background concentration.

3.3.1 Rule 2005

To demonstrate compliance with SCAQMD Rule 2005, each combustion unit was modeled individually using the stack parameters, emission rates, and building parameters from Appendix C, Tables 1, 2, and 3, respectively. The particular operational scenario selected for each combustion unit was chosen based on the load analysis results. In other words, only the parameters from the operational scenarios leading to the worst-case 1-hour, 1-hour federal, and annual NO_2 impacts were used. The results for each modeled scenario are presented in Appendix C, Table 5. These results were used to identify the maximum impacts described below.

The maximum modeled NO_2 concentrations are presented in Table 3-6, which is identical to Table 5.1-24 of the HBEP PTA, and are compared to the SCAQMD Rule 2005 significance threshold. Although each combustion emission unit was modeled, the results presented in Table 3-6 are only for the emission unit causing the highest modeled concentrations, in this case one combined-cycle CTG. The maximum modeled NO_2 concentrations were also added to representative background concentrations and compared to the state and federal ambient air quality standards for NO_2. Although the NO_2 concentrations per emission unit are greater than the SCAQMD Rule 2005 1-hour threshold, they are less than the ambient air quality standards and will be fully offset through the surrender of NO_X Regional Clean Air Incentives Market (RECLAIM) trading credits (RTCs). Therefore, the predicted NO_2 impacts from operation will be less than significant compared to SCAQMD Rule 2005.

TABLE 3-6
Rule 2005 Air Quality Thresholds and Standards Applicable to the Amended HBEP (per emission unit)

Pollutant/Averaging Time	Maximum Modeled Concentration, μg/m³ [a]	Significant Threshold, μg/m³ [b]	Background Concentration, μg/m³ [c]	Total Predicted Concentration, μg/m³	CAAQS, μg/m³	NAAQS, μg/m³
NO_2 (1-hour)	60.3	20	142	202	339	—
NO_2 (Federal 1-hour)	62.0	N/A	98.2	160	—	188
NO_2 (Annual)	0.27	1.0	21.8	22.1	57	100

[a] The maximum 1-hour and annual NO_2 concentrations include ambient NO_2 ratios of 0.80 (EPA, 2011) and 0.75 (EPA, 2005), respectively.

[b] Allowable change in air quality concentration per emission unit per SCAQMD Rule 2005, Appendix A.

[c] Background concentrations were the highest concentrations monitored during 2011 through 2013.

3.3.2 Regulation XVII (PSD)

To demonstrate compliance with SCAQMD Regulation XVII, operation of the Amended HBEP was modeled using the stack parameters, emission rates, and building parameters from Appendix C, Tables 1, 2, and 3, respectively. As with the Rule 2005 assessment, the particular operational scenario selected for each combustion unit was chosen based on the load analysis results. In other words, only the parameters from the operational scenarios leading to the worst-case 1-hour and annual NO_2, 1-hour and 8-hour CO, and 24-hour and annual PM_{10} impacts were used. However, for 24-hour PM_{10}, the scenario contributing the maximum impact had both GE Frame 7FA.05s operating at 44 percent load for 24 hours per day. Because this is an unlikely scenario, refined modeling was performed assuming one GE Frame 7FA.05 would operate 24 hours per day at 44 percent load and one GE Frame 7FA.05 would operate 20 hours per day at 44 percent load and 4 hours per day at 75 percent load. The results are presented in Appendix C, Table 6 and were used to identify the maximum impacts described below.

As shown in Table 3-7, which is a revision to Table 5.1-25 of the HBEP PTA, the maximum predicted 1-hour CO, 8-hour CO, annual NO_2, 24-hour PM_{10}, and annual PM_{10} impacts from operation of the Amended HBEP are below the Class II significance impact levels (SILs), Class II PSD Increment Standards, and significant monitoring concentrations. Therefore, additional analysis of 1-hour CO, 8-hour CO, annual NO_2, 24-hour PM_{10}, and annual PM_{10} impacts is not required. However, the maximum predicted 1-hour NO_2 impacts from operation of the Amended HBEP exceed the Class II SIL, with a radius of impact with predicted concentrations greater than 7.52 micrograms per cubic meter (μg/m^3) of 3.8 kilometers (km). Therefore, the cumulative impacts of the Amended HBEP and competing sources were assessed for all receptors where the Amended HBEP impacts alone exceeded the 1-hour NO_2 SIL, as described below.

TABLE 3-7
Amended HBEP Predicted Impacts Compared to the PSD Air Quality Impact Standards

Pollutant/Averaging Time	Maximum Modeled Concentration, μg/m^3	Significant Impact Level, μg/m^3	PSD Class II Increment Standard, μg/m^3	Significant Monitoring Concentration, μg/m^3
CO (1-hour)	631	2,000	N/A	N/A
CO (8-hour)	121	500	N/A	575
NO_2 (1-hour) [a]	94.5	7.52 [c]	N/A	N/A
NO_2 (Annual) [a]	0.64	1.0	25	14
PM_{10} (24-hour) [b]	4.97	5.0	30	10
PM_{10} (Annual)	0.64	1.0	17	N/A

[a] The maximum 1-hour and annual NO_2 concentrations include ambient NO_2 ratios of 0.80 (EPA, 2011) and 0.75 (EPA, 2005), respectively.
[b] The 24-hour PM_{10} concentration is based on one GE Frame 7FA.05 turbine operating 24 hours per day at 44 percent load and one GE Frame 7FA.05 turbine operating 20 hours per day at 44 percent load and 4 hours per day at 75 percent load.
[c] The SIL for 1-hour NO_2 is based on SCAQMD correspondence.

Note:
N/A = not applicable (i.e., no standard)

To assess the cumulative impacts of the Amended HBEP and competing sources, operation of the Amended HBEP was modeled with concurrent operation of the competing sources listed below, which were approved by the SCAQMD on October 8, 2013[4]:

- HBGS Units 1 and 2
- Orange County Sanitation – Fountain Valley
- Orange County Sanitation – Huntington Beach
- Beta Offshore
- Shipping Lanes

The stack parameters for each unit included in the competing source assessment are presented in Appendix C, Table 7. Stack parameters presented include source coordinates, elevation, stack height, temperature, exit velocity, and stack diameter for point sources and elevation, release height, and horizontal and vertical dimensions for volume sources. The 1-hour NO_2 emission rates (in g/s and lb/hr) for each unit included in the competing source assessment are presented in Appendix C, Table 8. Note that the stack parameters and emission rates used for the Amended HBEP were selected based on the load analysis results. In other words, only the parameters from the operational scenarios leading to the worst-case federal 1-hour NO_2 impacts

[4] Source parameters and emissions rates for all competing sources, with the exception of HBGS, were provided by SCAQMD.

were used. The building parameters were taken from Appendix C, Table 3. The competing source assessment results are presented in Appendix C, Table 9 and were used to identify the maximum impacts described below.

The receptor grid used in the competing source assessment modeling, shown in Figure 3-1, includes only those receptors in which the worst-case Amended HBEP 1-hour NO_2 impacts exceeded the SIL. In other words, only those receptors where the five-year average of modeled impacts exceed the SIL were included.

Table 3-8 presents a summary of the predicted cumulative 1-hour NO_2 impacts from operation of the Amended HBEP and competing sources, as well as a comparison to the National Ambient Air Quality Standard (NAAQS), and is a revision to Table 5.1-26 of the HBEP PTA. As shown, the predicted Amended HBEP cumulative impacts, including a representative background NO_2 concentration, are below the NAAQS. Therefore, operation of the Amended HBEP will not cause or contribute to a violation of the NAAQS.

TABLE 3-8
Amended HBEP and Competing Source Predicted 1-hour NO_2 Impacts Compared to the NAAQS

Pollutant	Averaging Time	Total Predicted Concentration, μg/m³ [a]	NAAQS, μg/m³
NO_2	1-hour	144	188

[a] The total predicted concentration for the federal 1-hour NO_2 standard is the 5-year average, high-8th-high modeled concentration paired with 98th percentile seasonal hour-of-day background concentrations for 2010 through 2012.

To assess potential impacts to Class I areas, operation of the Amended HBEP was modeled using the stack parameters, emission rates, and building parameters from Appendix C, Tables 1, 2, and 3, respectively. As with the Rule 2005 assessment, the particular operational scenario selected for each combustion unit was chosen based on the load analysis results. In other words, only the parameters from the operational scenarios leading to the worst-case annual NO_2 and 24-hour and annual PM_{10} impacts were used. The results are presented in Appendix C, Table 10 and were used to identify the maximum impacts described below.

Table 3-9 presents a summary of the predicted annual NO_2, 24-hour PM_{10}, and annual PM_{10} impacts and a comparison to the PSD Class I Increment Standards, and is a revision to Table 5.1-27 of the HBEP PTA. The predicted impacts from operation of the Amended HBEP are below the SILs. Therefore, the Amended HBEP would have a negligible impact at the more distant Class I areas.

TABLE 3-9
Amended HBEP Predicted Impacts Compared to the Class I SIL and PSD Class I Increment Standards

Pollutant/Averaging Time	Maximum Modeled Concentration at 50 km, μg/m³	Significant Impact Level, μg/m³	PSD Class I Increment Standard, μg/m³
NO_2 (Annual) [a]	0.0055	0.1	2.5
PM_{10} (24-hour)	0.042	0.3	2.0
PM_{10} (Annual)	0.0057	0.2	1.0

[a] The annual NO_2 concentration includes an ambient NO_2 ratio of 0.75 (EPA, 2005).

3.3.3 Class II Visibility

A visibility analysis for Class II areas within 50 km of the Amended HBEP was performed using the VISCREEN plume modeling program per the procedures outlined in the *Workbook for Plume Visual Impact Screening and Analysis* (U.S. Environmental Protection Agency [EPA], 1992), as described in Section 6.1.1 of the *Dispersion Modeling Protocol for the Amended Huntington Beach Energy Project* (see Appendix 5.1F of the HBEP PTA). Please note that Level I and Level II assessments were conducted using criterion for Class I areas, as no criteria exist for Class II areas. Therefore, the visibility assessment was conducted using overly conservative assumptions for Class II areas. However, even using the conservative approach, the modeled results from the visual assessment demonstrate that the Amended HBEP would not adversely affect visibility at nearby Class II areas.

Table 3-10, which is a revision to Table 5.1-28 of the HBEP PTA, summarizes the VISCREEN Level I modeled results for each Class II area evaluated, with the exception of Huntington Beach State Park (HB State Park), which was evaluated separately and is described in the following subsection. As shown, the maximum modeled values for color difference and contrast are presented for inside the area analyzed, regardless of the VISCREEN modeled lines of sight for the observer.

TABLE 3-10
Amended HBEP Level I VISCREEN Results

Class II Area	Minimum Distance (km)	Maximum Distance (km)	Variable	Sky	Terrain	Criteria [a]
Crystal Cove State Park	12.5	18.4	Color Difference	**2.489**	**5.405**	2
			Contrast	0.03	0.029	0.05
Water Canyon National Park	33.6	42.9	Color Difference	1.102	1.654	2
			Contrast	0.013	0.014	0.05
Chino Hills State Park	35.8	41.6	Color Difference	0.905	1.522	2
			Contrast	0.011	0.014	0.05
San Mateo Canyon Wilderness Area	44.3	57.6	Color Difference	0.698	1.111	2
			Contrast	0.008	0.011	0.05

Bold values exceed the Class I significant impact criterion.

[a] Levels of concern for Class I areas were used because no specific requirements or criteria exist for assessing Class II visibility impacts (Federal Land Managers [FLM], 2010).

As shown in Table 3-10, the Level I assessment results demonstrate that the Amended HBEP would be below the significance criterion for both color difference and contrast at Water Canyon National Park, Chino Hills State Park, and San Mateo Wilderness Area. The Level I assessment did, however, exceed the criterion for color difference at Crystal Cove State Park and, therefore, required a Level II assessment. The Level II assessment results are summarized in Table 3-11, which is a revision to Table 5.1-29 of the HBEP PTA.

TABLE 3-11
Amended HBEP Level II VISCREEN Results

Class II Area	Minimum Distance (km)	Maximum Distance (km)	Wind Speed (m/s) [a]	Stability [a]	Variable	Sky	Terrain	Criteria [b]
Crystal Cove State Park	12.5	18.4	3	D	Color Difference	0.263	0.642	2
					Contrast	0.003	0.003	0.05

Bold values exceed the Class I significant impact criterion.

[a] The Joint Frequency Distribution table used to calculate the wind speed and stability for the Level II assessment is presented in Appendix D, Table 1.

[b] Levels of concern for Class I areas were used because no specific requirements or criteria exist for assessing Class II visibility impacts (FLM, 2010).

Note:
m/s = meter(s) per second

As shown in Table 3-11, the Level II assessment results for Crystal Cove State Park are below the conservative Class I area criterion for both color difference and contrast; therefore, the Amended HBEP would not adversely affect visibility at nearby Class II areas. The VISCREEN input and output files, as well as the meteorological data used in this analysis, are included with this submission on compact disc.

Huntington Beach State Park. The HB State Park Class II area is a small swath of land which extends along the California Coast for 3.4 km, located directly west of the Amended HBEP. The HB State Park is bordered to the west by the Pacific Ocean and bordered to the east by California State Highway 1. On average, the width of the HB State Park is about 160 meters (m), with a range of widths between 130 m to 230 m. A plume blight analysis using VISCREEN would evaluate the change in background contrast and color affecting an observer looking through the center of a plume. The viewer's background *within* the limited area of interest can be defined as either an object (mountain side or building) or sky. A viewer standing on the border of the HB State Park looking across the beach or up the beach would not have any terrain or building to observe *within* the HB State Park. Therefore, the only feature *within* the HB State Park that would be observable is the sky. Areas outside of the HB State Park have not been identified and, therefore, were not evaluated.

The HB State Park is open between the hours of 6:00 am and 10:00 pm.[5] Therefore, the frequency of atmospheric stability class and winds blowing from the Amended HBEP across the HB State Park were determined for times when the HB State Park would be open. Table 3-12, which is identical to Table 5.1-30 of the HBEP PTA, provides a breakdown of the frequency of atmospheric stability class and winds blowing across the HB State Park toward the sectors of 120 degrees to 305 degrees from true north, based on the National Weather Service (NWS) John Wayne Airport meteorological data used throughout the air quality impacts analysis.

TABLE 3-12
Frequency and Stability of Winds Blowing from the Amended HBEP Toward HB State Park Between 6 am and 10 pm

Stability	Count [a]	Average Wind Speed (m/s)	Frequency (%) [b]
F	868	1.6	2.0
E	720	2.0	1.6
D	1,081	3.3	2.5
C	554	2.5	1.3
B	316	1.8	0.7
A	14	1.8	0.0

[a] The count of hours is based on the 5-year AERMET meteorological dataset.

[b] The frequency is based on a total of 43,824 hours in the 5-year AERMET meteorological dataset.

Air dispersion modeling categorizes the effects of atmospheric turbulence and wind speed into six different atmospheric stability classes, A through F. Of these, A is the most unstable and F is the most stable. A plume is most likely to remain cohesive in E or F stability conditions and least likely to remain cohesive in A or B stability conditions; however, due to the close proximity of the Amended HBEP to the HB State Park, the A or B stability conditions may not have the distance or time to disperse the plume downwind of the Amended HBEP exhaust stacks. Hours associated with the E and F atmospheric stability classes would, by definition, never occur during daylight hours.[6] Therefore, none of the Table 3-12 values associated with E or F stability conditions would have an effect on visibility at the HB State Park as those conditions would not occur during the daytime hour assessment period.

A VISCREEN Class II visibility analysis of the remaining atmospheric stability classes (A through D) and corresponding wind speeds identified in Table 3-12 was conducted. The procedures outlined in the *Workbook for Plume Visual Impact Screening and Analysis* (EPA, 1992) were followed to conduct the analysis. Based on the frequency of winds blowing across the HB State Park from the Amended HBEP and the modeled impacts, as presented in Table 3-13, which is a revision to Table 5.1-31 of the HBEP PTA, an observer looking across the HB State Park would have the sky background Class I thresholds exceeded for either contrast or color difference during hours associated with stability classes A, B, C, and D. On average,

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[5] Please refer to http://www.parks.ca.gov/?page_id=643 for details.

[6] D.B. Turner, *Workbook of Atmospheric Dispersion Estimates*, at page 6 (1969).

this corresponds to 4.5 percent of the time or 395 hours[7] per year when the sky background would be obstructed compared to the extremely conservative Class I area thresholds.

TABLE 3-13
Amended HBEP VISCREEN Analysis Results for HB State Park

Stability	VISCREEN Results (Contrast/Color Difference) [a]
D	0.098/7.589
C	0.076/5.921
B	0.182/10.141
A	0.139/7.873

[a] Class I criteria of |0.05| for contrast and 2.0 for color difference.

[b] Results presented are equivalent for either a Level I or Level II assessment. The Joint Frequency Distribution table used to calculate the wind speed and stability for the Level II assessment is presented in Appendix D, Table 2.

As noted above, this analysis is extremely conservative and only evaluates the Amended HBEP's plume impacts on color difference and contrast in comparison to the more restrictive, and not necessarily appropriate, Class I area thresholds. Also, the VISCREEN model only allows for one source or exhaust stack to be evaluated. Therefore, in order to assess all 5 Amended HBEP exhaust stacks, it was assumed that emissions from all 5 exhaust stacks are emitted from a single exhaust stack, which overestimates the Amended HBEP's visibility impacts. Additionally, this analysis conservatively used the annual average background visual range at the HB State Park, when visual impacts associated with inland emission sources or regional haze may have a greater negative impact on the background visual range than the Amended HBEP. Specifically, fires on the beach within the specified fire pits may have a greater negative impact on visibility at the HB State Park compared to the Amended HBEP. This analysis also conservatively does not discount present natural weather conditions, such as fog or rain, where the background would be naturally obscured and a plume from the Amended HBEP would not be perceptible.

Therefore, based on the limited and infrequent number of perceptibility impacts compared to the conservative Class I criteria identified using the VISCREEN model, the Amended HBEP would not cause an adverse impairment to perceptibility at the HB State Park. The VISCREEN input and output files, as well as the meteorological data used in this analysis, are included with this submission on compact disc.

3.3.4 Fumigation

To assess both inversion break-up and shoreline fumigation impacts, modeling was performed using the stack parameters and emission rates from Appendix C, Tables 1 and 2, respectively. As with the Rule 2005 assessment, the particular operational scenario selected for each combustion unit modeled was chosen based on the load analysis results. In other words, only the parameters from the operational scenarios leading to the worst-case 1-hour NO_2, 1-hour, 3-hour, and 24-hour SO_2, 1-hour and 8-hour CO, and 24-hour PM_{10} impacts were used. The effects of fumigation on the maximum modeled impacts were evaluated using AERSCREEN (version 15181). Tables 3-14 and 3-15 present the potential Amended HBEP operational inversion break-up and shoreline fumigation impacts, respectively. As indicated in Table 3-14, the inversion break-up fumigation CO, NO_2, SO_2, and PM_{10} concentrations combined with the background concentrations do not exceed the CAAQS or NAAQS, as applicable. Therefore, inversion break-up fumigation impacts of CO, NO_2, SO_2, and PM_{10} would be less than significant. As indicated in Table 3-15, this is the same result for shoreline fumigation impacts. Details of the inversion break-up and shoreline fumigation modeling are presented in Appendix E.

[7] Cumulative frequency of stability classes A, B, C, and D multiplied by 8,760 hours per year.

TABLE 3-14
Amended HBEP Operation Impacts Analysis – Inversion Break-up Fumigation Impacts Analysis Results Compared to the Ambient Air Quality Standards

Pollutant	Averaging Time	AERSCREEN Fumigation Result, µg/m³	Background Concentration, µg/m³ [a]	Total Predicted Concentration, µg/m³	CAAQS, µg/m³	NAAQS, µg/m³
NO_2 [b]	1-hour (max)	85.3	142	227	339	—
SO_2	1-hour (max)	5.45	20.2	25.7	655	—
	3-hour	5.32	20.2	25.5	—	1,300
	24-hour	5.21	5.20	10.4	105	—
CO	1-hour	529	3,321	3,850	23,000	40,000
	8-hour	147	2,519	2,666	10,000	10,000
PM_{10}	24-hour	10.6	51.0	61.6	N/A	150

[a] Background concentrations were the highest concentrations monitored during 2011 through 2013.

[b] The 1-hour NO_2 concentration includes an ambient NO_2 ratio of 0.80 (EPA, 2011).

Note:
N/A = not applicable (i.e., area is designated nonattainment such that a comparison to the standard is not required)

TABLE 3-15
Amended HBEP Operation Impacts Analysis – Shoreline Fumigation Impacts Analysis Results Compared to the Ambient Air Quality Standards

Pollutant	Averaging Time	AERSCREEN Fumigation Result, µg/m³	Background Concentration, µg/m³ [a]	Total Predicted Concentration, µg/m³	CAAQS, µg/m³	NAAQS, µg/m³
NO_2 [b]	1-hour (max)	47.2	142	189	339	—
SO_2	1-hour (max)	3.52	20.2	23.7	655	—
	3-hour	3.55	20.2	23.8	—	1,300
	24-hour	2.13	5.20	7.33	105	—
CO	1-hour	125	3,321	3,446	23,000	40,000
	8-hour	37.6	2,519	2,557	10,000	10,000
PM_{10}	24-hour	10.5	51.0	61.5	N/A	150

[a] Background concentrations were the highest concentrations monitored during 2011 through 2013.

[b] The 1-hour NO_2 concentration includes an ambient NO_2 ratio of 0.80 (EPA, 2011).

Note:
N/A = not applicable (i.e., area is designated nonattainment such that a comparison to the standard is not required)

3.3.5 Overlap Impacts Analysis

Based on the proposed schedule for demolition and construction, commissioning, and operation, two scenarios were selected for inclusion in the Amended HBEP overlap impacts analysis:

- Combined-cycle power block operation with simultaneous construction of the simple-cycle power block.
- Combined-cycle and simple-cycle power block operation with simultaneous demolition of HBGS Units 1 and 2.

Although other potential overlap scenarios were identified, they were either previously evaluated or were not considered to result in the worst possible air quality impacts. Specifically:

- Operation of the combined-cycle power block is expected to overlap with commissioning of the simple-cycle power block. However, those impacts were previously addressed in Section 3.2.
- Operation of the combined-cycle power block is also expected to overlap with demolition of HBGS Units 3 and 4. However, impacts associated with demolition of HBGS Units 3 and 4 are expected to be similar

to those associated with demolition of HBGS Units 1 and 2. The latter was selected as an overlap scenario because it occurs simultaneously with operation of both power blocks, rather than just one.

Overlap Scenario 1. The first overlap scenario is intended to determine modeled impacts from the simultaneous operation of the combined-cycle power block and construction of the simple-cycle power block. To evaluate the air quality impacts from this scenario, the combined-cycle power block operating scenarios resulting in maximum predicted impacts were modeled with the maximum simple-cycle power block construction emissions.

The parameters for each area and point source included in Overlap Scenario 1 are presented in Appendix F, Table 1. Parameters presented include source coordinates, elevation, release height, and vertical dimension for area sources and source coordinates, elevation, stack height, temperature, exit velocity, and stack diameter for point sources. The short-term and annual emission rates (in g/s and lb/hr) for each source included in Overlap Scenario 1 are presented in Appendix F, Table 2.

The building parameters included in Overlap Scenario 1 are presented in Appendix F, Table 3. The building parameters include the presence of existing HGBS Units 1 and 2, in addition to those of the GE Frame 7FA.05s.

The results for Overlap Scenario 1 are presented in Appendix F, Table 4. As with the emission rates, these results are sorted by short-term and annual averaging periods. These results were used to identify the maximum impacts provided below.

Table 3-16 presents the results of the impacts analysis for Overlap Scenario 1, and is a revision to Table 5.1-33 of the HBEP PTA. As indicated, the maximum predicted CO, NO_2, SO_2, and $PM_{2.5}$ modeled concentrations combined with the background concentrations will be below the ambient air quality standards for each averaging period. For PM_{10}, the annual and 24-hour background concentrations exceed or equal more than 95 percent of the CAAQS without adding the modeled concentrations. As a result, the predicted impacts combined with the background concentrations would be greater than the CAAQS. However, as described in Section 5.1.7 of the HBEP PTA, Amended HBEP emissions will be fully offset and/or reduced through implementation of fugitive dust control measures. Therefore, operation of the combined-cycle power block and construction of the simple-cycle power block will be less than significant with mitigation.

TABLE 3-16
Maximum Modeled Impacts from Overlap Scenario 1

Pollutant	Averaging Time	Maximum Modeled Concentration, μg/m³	Background Concentration, μg/m³ [a]	Total Predicted Concentration, μg/m³	CAAQS, μg/m³	NAAQS, μg/m³
CO	1-hour	631	3,321	3,952	23,000	40,000
	8-hour	122	2,519	2,641	10,000	10,000
NO_2 [b]	1-hour (max)	94.3	142	236	339	—
	1-hour (98th percentile) [c]	—	—	126	—	188
	Annual	0.70	21.8	22.5	57	100
SO_2	1-hour (max)	5.75	20.2	26.0	655	—
	1-hour (99th percentile) [d]	4.86	8.80	13.7	—	196
	3-hour	5.01	20.2	25.2	—	1,300
	24-hour	1.66	5.20	6.86	105	—
PM_{10}	24-hour	9.33	51.0	60.3	50	150
	Annual	0.88	19.3	20.2	20	—
$PM_{2.5}$	24-hour (98th percentile) [e]	3.15	21.3	24.4	—	35
	Annual	0.64	8.60	9.24	12	12

[a] Background concentrations were the highest concentrations monitored during 2011 through 2013.

[b] The maximum 1-hour and annual NO_2 concentrations include ambient NO_2 ratios of 0.80 (EPA, 2011) and 0.75 (EPA, 2005), respectively.

TABLE 3-16
Maximum Modeled Impacts from Overlap Scenario 1

Pollutant	Averaging Time	Maximum Modeled Concentration, µg/m³	Background Concentration, µg/m³ [a]	Total Predicted Concentration, µg/m³	CAAQS, µg/m³	NAAQS, µg/m³

[c] The total predicted concentration for the federal 1-hour NO_2 standard is the 5-year average, high-8th-high modeled concentration paired with 98th percentile seasonal hour-of-day background concentrations for 2010 through 2012.

[d] The total predicted concentration for the federal 1-hour SO_2 standard is the 5-year average, high-4th-high modeled concentration combined with the 3-year average, 99th percentile background concentration.

[e] The total predicted concentration for the federal 24-hour $PM_{2.5}$ standard is the 5-year average, high-8th-high modeled concentration combined with the 3-year average, 98th percentile background concentration.

Overlap Scenario 2. The second overlap scenario is intended to determine modeled impacts from the simultaneous operation of the combined-cycle and simple-cycle power blocks and demolition of existing HBGS Units 1 and 2. To evaluate the air quality impacts from this scenario, the combined-cycle and simple-cycle power block operating scenarios resulting in maximum predicted impacts were modeled with the maximum HBGS Units 1 and 2 demolition emissions.

The parameters for each area and point source included in Overlap Scenario 2 are presented in Appendix F, Table 5. Parameters presented include source coordinates, elevation, release height, and vertical dimension for area sources and source coordinates, elevation, stack height, temperature, exit velocity, and stack diameter for point sources. The short-term and annual emission rates (in g/s and lb/hr) for each source included in Overlap Scenario 2 are presented in Appendix F, Table 6.

The building parameters included in Overlap Scenario 2 are presented in Appendix F, Table 7. The building parameters include the presence of the GE Frame 7FA.05s and GE LMS 100PBs.

The results for Overlap Scenario 2 are presented in Appendix F, Table 8. As with the emission rates, these results are sorted by short-term and annual averaging periods. These results were used to identify the maximum impacts provided below.

Table 3-17 presents the results of the impacts analysis for Overlap Scenario 2, and is a revision to Table 5.1-34 of the HBEP PTA. As indicated, the maximum predicted CO, NO_2, SO_2, and $PM_{2.5}$ modeled concentrations combined with the background concentrations will be below the ambient air quality standards for each averaging period. For PM_{10}, the annual and 24-hour background concentrations exceed or equal more than 95 percent of the CAAQS without adding the modeled concentrations. As a result, the predicted impacts combined with the background concentrations would be greater than the CAAQS. However, as described in Section 5.1.7 of the HBEP PTA, Amended HBEP emissions will be fully offset and/or reduced through implementation of fugitive dust control measures. Therefore, operation of the combined-cycle and simple-cycle power blocks and demolition of HBGS Units 1 and 2 will be less than significant with mitigation.

TABLE 3-17
Maximum Modeled Impacts from Overlap Scenario 2

Pollutant	Averaging Time	Maximum Modeled Concentration, µg/m³	Background Concentration, µg/m³ [a]	Total Predicted Concentration, µg/m³	CAAQS, µg/m³	NAAQS, µg/m³
CO	1-hour	634	3,321	3,955	23,000	40,000
	8-hour	125	2,519	2,644	10,000	10,000
NO_2 [b]	1-hour (max)	94.8	142	237	339	—
	1-hour (98th percentile) [c]	—	—	126	—	188
	Annual	0.81	21.8	22.6	57	100
SO_2	1-hour (max)	5.77	20.2	26.0	655	—
	1-hour (99th percentile) [d]	4.87	8.80	13.7	—	196
	3-hour	5.03	20.2	25.2	—	1,300
	24-hour	1.66	5.20	6.86	105	—

TABLE 3-17
Maximum Modeled Impacts from Overlap Scenario 2

Pollutant	Averaging Time	Maximum Modeled Concentration, µg/m³	Background Concentration, µg/m³ [a]	Total Predicted Concentration, µg/m³	CAAQS, µg/m³	NAAQS, µg/m³
PM_{10}	24-hour	5.81	51.0	56.8	50	150
	Annual	1.00	19.3	20.3	20	—
$PM_{2.5}$	24-hour (98th percentile) [e]	3.08	21.3	24.4	—	35
	Annual	0.66	8.60	9.26	12	12

[a] Background concentrations were the highest concentrations monitored during 2011 through 2013.

[b] The maximum 1-hour and annual NO_2 concentrations include ambient NO_2 ratios of 0.80 (EPA, 2011) and 0.75 (EPA, 2005), respectively.

[c] The total predicted concentration for the federal 1-hour NO_2 standard is the 5-year average, high-8th-high modeled concentration paired with 98th percentile seasonal hour-of-day background concentrations for 2010 through 2012.

[d] The total predicted concentration for the federal 1-hour SO_2 standard is the 5-year average, high-4th-high modeled concentration combined with the 3-year average, 99th percentile background concentration.

[e] The total predicted concentration for the federal 24-hour $PM_{2.5}$ standard is the 5-year average, high-8th-high modeled concentration combined with the 3-year average, 98th percentile background concentration.

SECTION 4

Public Health Impacts Analysis

A health risk assessment (HRA) was conducted to assess the potential public health impacts and exposure associated with airborne emissions from the proposed demolition and construction and routine operation of the Amended HBEP. As applicable, the HRA results were also compared to the limits for excess cancer risk, cancer burden, and noncancer chronic and acute hazard indices contained within SCAQMD Rule 1401.

4.1 Demolition and Construction

The demolition and construction HRA estimated the rolling cancer risks for each 10-year period during a 30-year exposure duration (starting with exposure during the third trimester), aligned with the expected construction duration, at the Point of Maximum Impact (PMI), Maximum Exposed Individual Resident (MEIR), Maximum Exposed Individual Worker (MEIW), and maximum exposed sensitive receptor. The excess cancer risks were estimated using the following:

- Equations 5.4.1.1 and 8.2.4A from the *Air Toxic Hot Spots Guidance Manual for Preparation of Health Risk Assessments* (Office of Environmental Health Hazard Assessment [OEHHA], 2015) for residential exposure
- Equations 5.4.1.2A, 5.4.1.2B, and 8.2.4B from the *Air Toxic Hot Spots Guidance Manual for Preparation of Health Risk Assessments* (OEHHA, 2015) for worker exposure
- The maximum annual ground-level concentrations used to estimate risk were determined through dispersion modeling with AERMOD (version 15181)
- The AERMOD modeling approach followed that used to prepare the criteria pollutant modeling analysis, except that the receptor grid included census and sensitive receptors and excluded receptors located within AES-controlled property (see Appendix 5.9B of the HBEP PTA for the AERMOD setup)
- The demolition and construction emission estimates modeled are presented in Table 2-3

Chronic risks were also estimated for the PMI, MEIR, MEIW, and maximum exposed sensitive receptor, based on the same emission rates and ground-level concentrations described above. To calculate chronic risk, as characterized by a health index, the maximum annual ground-level concentration was divided by the DPM Reference Exposure Level of 5 $\mu g/m^3$ (OEHHA, 2015).

The results of the demolition and construction HRA show that the excess cancer risk at the PMI, MEIR, MEIW, and maximum exposed sensitive receptor are 5.22, 4.23, 0.25, and 0.48, respectively, which is less than the significant threshold of 10 in 1 million. Similarly, the chronic hazard indices at the PMI, MEIR, MEIW, and maximum exposed sensitive receptor are 0.0021, 0.0017, 0.0021, and 0.00019, respectively, which is less than the significant threshold of 1.0. Therefore, predicted impacts associated with the finite demolition and construction activities are less than significant. Detailed calculations are provided in Appendix G. The model input and output files are included with this submission on compact disc.

4.2 Operation

The air toxics emissions for the GE Frame 7FA.05s, GE LMS 100PBs, and auxiliary boiler were calculated consistent with the emission factors presented in Section 2.3.4 and a natural gas heat content of 1,050 British thermal unit(s) per cubic foot (Btu/cf). Detailed calculations are presented in Appendix 5.1B of the HBEP PTA, which has been revised and included with this submission on compact disc. These emission rates were used to conduct an HRA for routine operation of the Amended HBEP, the results of which are discussed below.

The *Hotspots Analysis Reporting Program Version 2* was used to perform the HRA, based on model inputs similar to those used for the criteria pollutant modeling, with the following SCAQMD-specific triggers:

- Mandatory minimum pathways and homegrown pathways were selected to evaluate cancer risk and chronic hazard index at the PMI, MEIR, and sensitive receptor
- Worker pathways (inhalation, dermal, and soil) were selected to evaluate cancer risk and chronic hazard index at the MEIW
- The Draft Risk Management Policy (RMP) Derived method was used to calculate cancer risk at the PMI, MEIR, and sensitive receptor, consistent with SCAQMD guidance (SCAQMD, 2015b); the OEHHA Derived method was used for all remaining scenarios

A summary of the excess cancer risk and chronic and acute hazard indices at the PMI, as well as the maximum predicted public health impacts for worker, residential, and sensitive receptors, has been included in Tables 4-1 and 4-2, which are revisions to Tables 5.9-4 and 5.9-5 of the HBEP PTA. The results in Table 4-1 represent a comparison of the total predicted Amended HBEP impact to the SCAQMD's CEQA significance thresholds, while the results in Table 4-2 represent the predicted risk for each individual emission unit in accordance with SCAQMD Rule 1401. The model input and output files are included with this submission on compact disc.

As shown in Table 4-1, predicted impacts for the Amended HBEP are below the significance thresholds of 10 in 1 million for excess cancer risk and chronic and acute hazard index of 1.0. Therefore, the predicted health risks associated with the Amended HBEP will be less than significant.

TABLE 4-1
Operational Health Risk Assessment Summary: Facility [a]

Risk [b]	Receptor Number	Receptor Coordinates (UTM, m)		Value
		Easting	Northing	
Cancer Risk at the PMI (per million) [c]	681	409700	3723500	4.27
Cancer Risk at the MEIR (per million) [c]	815	410000	3723700	2.68
Cancer Risk at a Sensitive Receptor (per million) [c]	12905	409969.5	3724223	1.49
Cancer Risk at the MEIW (per million) [d]	681	409700	3723500	0.15
Chronic Hazard Index at the PMI	681	409700	3723500	0.011
Chronic Hazard Index at the MEIR	815	410000	3723700	0.0068
Chronic Hazard Index at a Sensitive Receptor	12905	409969.5	3724223	0.0038
Chronic Hazard Index at the MEIW	681	409700	3723500	0.011
Acute Hazard Index at the PMI	552	409600	3723300	0.056
Acute Hazard Index at the MEIR	719	410000	3723550	0.019
Acute Hazard Index at a Sensitive Receptor	12902	410027.1	3723140	0.013
Acute Hazard Index at the MEIW	552	409600	3723300	0.056

[a] The results in Table 4-1 represent the combined predicted risk for all five combustion units operating simultaneously.

[b] A facility with an excess cancer risk less than 10 in 1 million individuals is considered to be less than significant. A chronic or acute hazard index less than 1.0 for the facility is considered to be a less-than-significant health risk.

[c] Cancer risk values are based on the Draft RMP methodology.

[d] Cancer risk values are based on the OEHHA Derived methodology.

Note:
UTM = Universal Transverse Mercator

As shown in Table 4-2, the GE Frame 7FA.05s exceed the incremental increase in cancer risk threshold of 1 in 1 million; therefore, best available control technology for toxics (T-BACT) will be required for these units. The GE

LMS 100PBs and auxiliary boiler do not trigger the regulatory requirement for T-BACT as their predicted impacts are below the incremental increase in cancer risk threshold of 1 in 1 million. Although not required in all cases, the emission control technologies included in the Amended HBEP for all emission sources are considered to be T-BACT. All sources have predicted impacts below the chronic and acute hazard index of 1.0, resulting in less-than-significant impacts with controls.

It should be noted that the maximum impacts reported in Table 4-1 represent the maximum predicted impacts at one receptor from all sources combined. In contrast, the maximum impacts reported for each individual source in Table 4-2 may occur at different receptors. Therefore, the Amended HBEP totals in Table 4-2 are not directly additive and should not be directly compared to the results presented in Table 4-1.

Because the predicted cancer risk, per individual unit, is greater than 1 in 1 million, the cancer burden was calculated for each census block receptor consistent with SCAQMD guidance (SCAQMD, 2015b). The cancer burden for the Amended HBEP was estimated at 8.7 x 10^{-9}, which is well below the significance threshold of 0.5. Therefore, the Amended HBEP will not significantly increase cancer burden in the vicinity of the site.

TABLE 4-2
Operational Health Risk Assessment Summary: Individual Units [a]

Risk [b]	GE Frame 7FA.05-01	GE Frame 7FA.05-02	GE LMS 100PB-01	GE LMS 100PB-02	Auxiliary Boiler
Cancer Risk at the PMI (per million) [c]	1.71	2.37	0.086	0.086	0.30
Cancer Risk at the MEIR (per million) [c]	1.19	1.36	0.059	0.050	0.043
Cancer Risk at a Sensitive Receptor (per million) [c]	0.66	0.73	0.046	0.046	0.0078
Cancer Risk at the MEIW (per million) [d]	0.063	0.086	0.0031	0.0031	0.0088
Chronic Hazard Index at the PMI	0.0043	0.0060	0.00022	0.00022	0.00041
Chronic Hazard Index at the MEIR	0.0030	0.0034	0.00015	0.00013	0.000059
Chronic Hazard Index at a Sensitive Receptor	0.0017	0.0060	0.00012	0.00012	0.000011
Chronic Hazard Index at the MEIW	0.0043	0.0060	0.00022	0.00022	0.00041
Acute Hazard Index at the PMI	0.022	0.032	0.0017	0.0017	0.00070
Acute Hazard Index at the MEIR	0.0080	0.0090	0.0012	0.0012	0.00023
Acute Hazard Index at a Sensitive Receptor	0.0047	0.0065	0.00066	0.00070	0.00021
Acute Hazard Index at the MEIW	0.022	0.032	0.0017	0.0017	0.00070

[a] The results in Table 4-2 represent the predicted excess risk for each individual emission unit in accordance with SCAQMD Rule 1401.

[b] A source with an excess cancer risk less than 1 in 1 million individuals is considered to be less than significant. A source with an excess cancer risk less than 10 in 1 million is considered less than significant if T-BACT is installed. A chronic or acute hazard index less than 1.0 for each source is considered to be a less-than-significant health risk.

[c] Cancer risk values are based on the Draft RMP Derived methodology.

[d] Cancer risk values are based on the OEHHA Derived methodology.

SECTION 5

References

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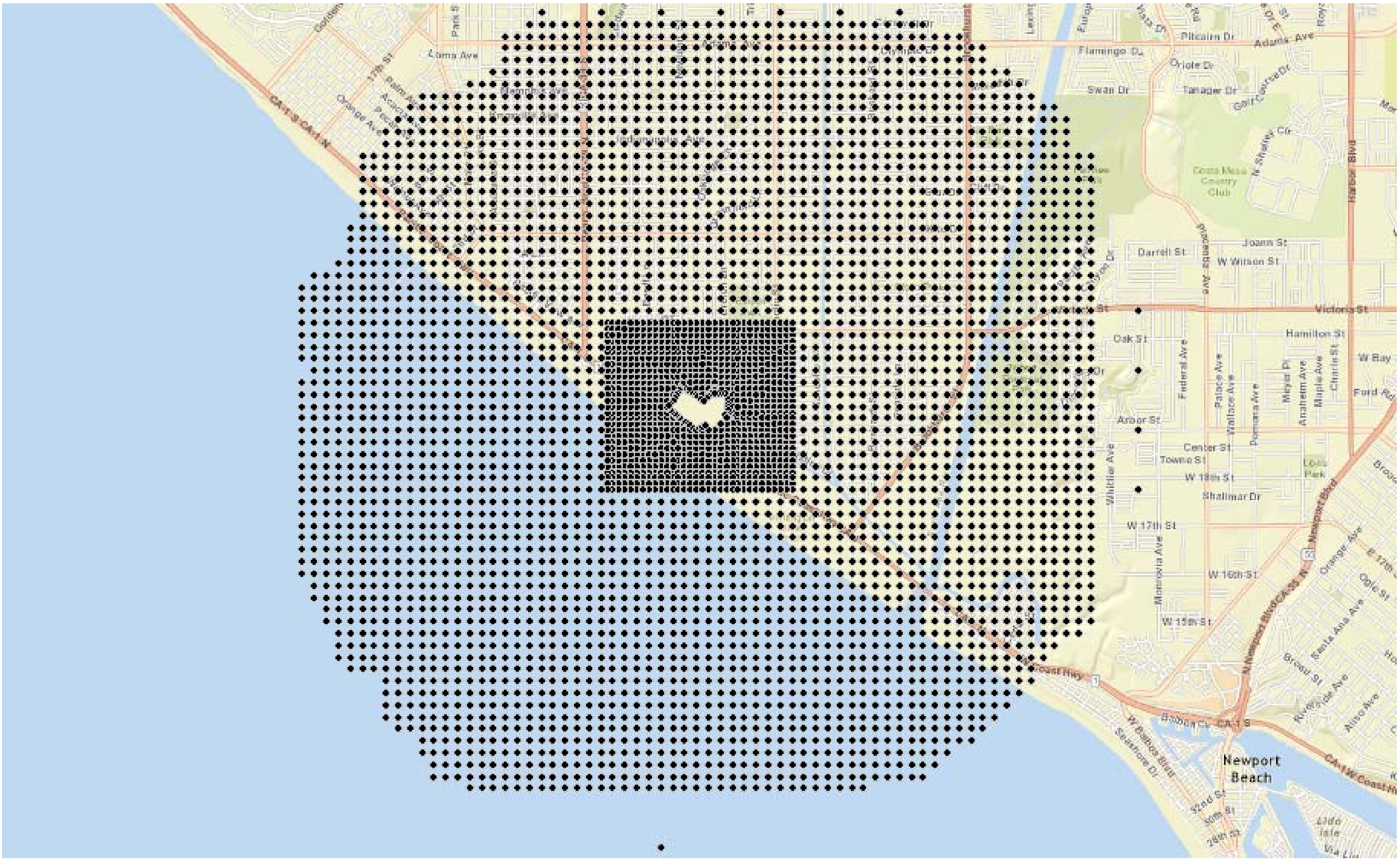
Figure

Amended Huntington Beach Energy Project
Attachment A11-1, Figure 3-1
Competing Source Receptor Grid
December 2015



Appendix A
Air Quality Impact Analysis—Demolition and Construction

Amended Huntington Beach Energy Project

Appendix A, Table 1

Demolition and Construction Stack Parameters

December 2015

Area Poly Sources

Source ID	Base Elevation (m)	Release Height (m)	Number of Vertices	Vertical Dimension (m)	Easting (X1) (m)	Northing (Y1) (m)	Easting (X2) (m)	Northing (Y2) (m)	Easting (X3) (m)	Northing (Y3) (m)	Easting (X4) (m)	Northing (Y4) (m)	Easting (X5) (m)	Northing (Y5) (m)	Easting (X6) (m)	Northing (Y6) (m)	Easting (X7) (m)	Northing (Y7) (m)
FUG	3.66	0.00	7	1.00	409550	3723300	409550	3723175	409515	3723175	409450	3723130	409350	3723200	409425	3723275	409475	3723300

Point Sources

Source ID	Stack Release Type (Beta)	Easting (X) (m)	Northing (Y) (m)	Base Elevation (m)	Stack Height (m)	Temperature (K)	Exit Velocity (m/s)	Stack Diameter (m)
EAST01	Horizontal	409425	3723150	3.66	4.60	533	18.0	0.127
EAST02	Horizontal	409450	3723150	3.66	4.60	533	18.0	0.127
EAST03	Horizontal	409400	3723175	3.66	4.60	533	18.0	0.127
EAST04	Horizontal	409425	3723175	3.66	4.60	533	18.0	0.127
EAST05	Horizontal	409450	3723175	3.66	4.60	533	18.0	0.127
EAST06	Horizontal	409475	3723175	3.66	4.60	533	18.0	0.127
EAST07	Horizontal	409500	3723175	3.66	4.60	533	18.0	0.127
EAST08	Horizontal	409525	3723175	3.66	4.60	533	18.0	0.127
EAST09	Horizontal	409550	3723175	3.66	4.60	533	18.0	0.127
EAST10	Horizontal	409375	3723200	3.66	4.60	533	18.0	0.127
EAST11	Horizontal	409400	3723200	3.66	4.60	533	18.0	0.127
EAST12	Horizontal	409425	3723200	3.66	4.60	533	18.0	0.127
EAST13	Horizontal	409450	3723200	3.66	4.60	533	18.0	0.127
EAST14	Horizontal	409475	3723200	3.66	4.60	533	18.0	0.127
EAST15	Horizontal	409500	3723200	3.66	4.60	533	18.0	0.127
EAST16	Horizontal	409525	3723200	3.66	4.60	533	18.0	0.127
EAST17	Horizontal	409550	3723200	3.66	4.60	533	18.0	0.127
EAST18	Horizontal	409400	3723225	3.66	4.60	533	18.0	0.127
EAST19	Horizontal	409425	3723225	3.66	4.60	533	18.0	0.127
EAST20	Horizontal	409450	3723225	3.66	4.60	533	18.0	0.127
EAST21	Horizontal	409475	3723225	3.66	4.60	533	18.0	0.127
EAST22	Horizontal	409500	3723225	3.66	4.60	533	18.0	0.127
EAST23	Horizontal	409525	3723225	3.66	4.60	533	18.0	0.127
EAST24	Horizontal	409550	3723225	3.66	4.60	533	18.0	0.127
EAST25	Horizontal	409400	3723250	3.66	4.60	533	18.0	0.127
EAST26	Horizontal	409425	3723250	3.66	4.60	533	18.0	0.127
EAST27	Horizontal	409450	3723250	3.66	4.60	533	18.0	0.127
EAST28	Horizontal	409475	3723250	3.66	4.60	533	18.0	0.127
EAST29	Horizontal	409500	3723250	3.66	4.60	533	18.0	0.127
EAST30	Horizontal	409525	3723250	3.66	4.60	533	18.0	0.127
EAST31	Horizontal	409550	3723250	3.66	4.60	533	18.0	0.127
EAST32	Horizontal	409425	3723275	3.66	4.60	533	18.0	0.127
EAST33	Horizontal	409450	3723275	3.66	4.60	533	18.0	0.127
EAST34	Horizontal	409475	3723275	3.66	4.60	533	18.0	0.127
EAST35	Horizontal	409500	3723275	3.66	4.60	533	18.0	0.127
EAST36	Horizontal	409525	3723275	3.66	4.60	533	18.0	0.127
EAST37	Horizontal	409550	3723275	3.66	4.60	533	18.0	0.127
EAST38	Horizontal	409475	3723300	3.66	4.60	533	18.0	0.127
EAST39	Horizontal	409500	3723300	3.66	4.60	533	18.0	0.127
EAST40	Horizontal	409525	3723300	3.66	4.60	533	18.0	0.127
EAST41	Horizontal	409550	3723300	3.66	4.60	533	18.0	0.127

This table contains the same information presented in Appendix 5.1C, Table 5.1C.1 of the HBEP PTA.

Amended Huntington Beach Energy Project

Appendix A, Table 2 [a]

Demolition and Construction Emission Rates

December 2015

Emission Rates for 1-hour, 3-hour, 8-hour, and 24-hour Modeling

	1-hour NO_2		1-hour CO		8-hour CO		1-hour SO_2		3-hour SO_2		24-hour SO_2		24-hour PM_{10}		24-hour $PM_{2.5}$	
Source ID	(g/s)	(lb/hr)	(g/s)	(lb/hr)	(g/s)	(lb/hr)	(g/s)	(lb/hr)	(g/s)	(lb/hr)	(g/s)	(lb/hr)	(g/s)	(lb/hr)	(g/s)	(lb/hr)
FUG	-	-	-	-	-	-	-	-	-	-	-	-	0.020	0.16	0.0077	0.061
EXH [b]	0.21	1.63	1.08	8.55	1.08	8.55	0.0018	0.014	0.0018	0.014	0.0008	0.0060	0.0005	0.0043	0.0005	0.0043
Maximum Month	39		27		27		27		27		27		16		16	

Emission Rates for Annual Modeling

	Annual NO_2		Annual PM_{10}		Annual $PM_{2.5}$	
Source ID	(g/s)	(lb/hr)	(g/s)	(lb/hr)	(g/s)	(lb/hr)
FUG	-	-	0.012	0.097	0.0034	0.027
EXH [b]	0.063	0.50	0.0008	0.0060	0.0008	0.0060
Maximum Months	36-47		27-38		27-38	

[a] This table contains the same information presented in Appendix 5.1C, Table 5.1C.2 of the HBEP PTA

[b] Emission rates for exhaust sources are the total for all sources

Amended Huntington Beach Energy Project
Appendix A, Table 3
Demolition and Construction Results
December 2015

		NO_2 (µg/m^3) [a]			CO (µg/m^3)		SO_2 (µg/m^3)				PM_{10} (µg/m^3)		$PM_{2.5}$ (µg/m^3)	
Source	Year	1-hour	1-hour (federal) [b]	Annual	1-hour	8-hour	1-hour	1-hour (federal	3-hour	24-hour	24-hour	Annual	24-hour	Annual
ALL		26.6	122	2.00	175	136	0.29	0.29	0.27	0.058	10.6	2.94	3.38	0.83
EXH	2010	26.6	26.0	2.00	175	136	0.29	0.29	0.27	0.058	0.041	0.032	0.038	0.032
FUG		-	-	-	-	-	-	-	-	-	10.6	2.91	3.34	0.80
ALL		26.5	121	2.00	174	140	0.29	0.29	0.27	0.056	9.89	2.91	3.24	0.82
EXH	2011	26.5	26.2	2.00	174	140	0.29	0.29	0.27	0.056	0.040	0.032	0.037	0.032
FUG		-	-	-	-	-	-	-	-	-	9.86	2.88	3.20	0.79
ALL		26.8	120	2.05	176	131	0.29	0.29	0.27	0.059	10.7	3.01	3.43	0.85
EXH	2012	26.8	26.4	2.05	176	131	0.29	0.29	0.27	0.059	0.042	0.033	0.037	0.033
FUG		-	-	-	-	-	-	-	-	-	10.7	2.98	3.40	0.82
ALL		26.9	121	2.00	177	139	0.30	0.29	0.28	0.058	10.8	3.01	3.51	0.85
EXH	2013	26.9	26.4	2.00	177	139	0.30	0.29	0.28	0.058	0.041	0.032	0.037	0.032
FUG		-	-	-	-	-	-	-	-	-	10.8	2.98	3.48	0.82
ALL		27.0	121	1.92	177	134	0.30	0.29	0.28	0.056	11.1	2.84	3.54	0.80
EXH	2014	27.0	26.5	1.92	177	134	0.30	0.29	0.28	0.056	0.040	0.031	0.036	0.031
FUG		-	-	-	-	-	-	-	-	-	11.1	2.81	3.51	0.77

[a] The maximum 1-hour and annual NO_2 concentrations include ambient NO_2 ratios of 0.80 (EPA, 2011) and 0.75 (EPA, 2005), respectively.

[b] The total predicted concentration for the federal 1-hour NO_2 standard is the high-8th-high modeled concentration paired with 98th percentile seasonal hour-of-day background concentrations for 2010 through 2012.

Appendix B
Air Quality Impact Analysis—Commissioning

Amended Huntington Beach Energy Project
Appendix B, Table 1
Commissioning Stack Parameters
December 2015

Point Sources

Scenario	Source ID	Easting (X) (m)	Northing (Y) (m)	Base Elevation (m)	Stack Height (m)	Temperature (K)	Exit Velocity (m/s)	Stack Diameter (m)
GE 7FA.05, 10% Load	7FA01	409449	3723146	3.66	45.7	361	9.33	6.10
	7FA02	409474	3723182	3.66	45.7	361	9.33	6.10
	Aux Boiler	409438	3723236	3.66	24.4	432	21.2	0.91
GE 7FA.05, 40% Load	7FA01	409449	3723146	3.66	45.7	359	11.9	6.10
	7FA02	409474	3723182	3.66	45.7	359	11.9	6.10
	Aux Boiler	409438	3723236	3.66	24.4	432	21.2	0.91
GE 7FA.05, 80% Load	7FA01	409449	3723146	3.66	45.7	366	16.1	6.10
	7FA02	409474	3723182	3.66	45.7	366	16.1	6.10
	Aux Boiler	409438	3723236	3.66	24.4	432	21.2	0.91
GE LMS 100PB, 5% Load	7FA01	409449	3723146	3.66	45.7	350	12.2	6.10
	7FA02	409474	3723182	3.66	45.7	350	12.2	6.10
	LMS01	409149	3723193	3.66	24.4	728	10.0	4.11
	LMS02	409185	3723168	3.66	24.4	728	10.0	4.11
	Aux Boiler	409438	3723236	3.66	24.4	432	21.2	0.91
GE LMS 100PB, 75% Load	7FA01	409449	3723146	3.66	45.7	350	12.2	6.10
	7FA02	409474	3723182	3.66	45.7	350	12.2	6.10
	LMS01	409149	3723193	3.66	24.4	694	33.3	4.11
	LMS02	409185	3723168	3.66	24.4	694	33.3	4.11
	Aux Boiler	409438	3723236	3.66	24.4	432	21.2	0.91
GE LMS 100PB, Full Load	7FA01	409449	3723146	3.66	45.7	350	12.2	6.10
	7FA02	409474	3723182	3.66	45.7	350	12.2	6.10
	LMS01	409149	3723193	3.66	24.4	748	23.8	4.11
	LMS02	409185	3723168	3.66	24.4	748	23.8	4.11
	Aux Boiler	409438	3723236	3.66	24.4	432	21.2	0.91

This table contains the same information presented in Appendix 5.1C, Table 5.1C.4 of the HBEP PTA.

Amended Huntington Beach Energy Project

Appendix B, Table 2 [a]

Commissioning Emission Rates

December 2015

Short-Term Pollutant Commissioning Emissions

		1-hour NO_2		1-hour CO		8-hour CO	
Scenario	Source ID	(g/s)	(lb/hr)	(g/s)	(lb/hr)	(g/s)	(lb/hr)
GE 7FA.05, 10% Load	7FA01	16.4	130	239	1,900	239	1,900
	7FA02	16.4	130	239	1,900	239	1,900
	Aux Boiler	0.054	0.42	0.36	2.83	0.30	2.37
GE 7FA.05, 40% Load	7FA01	8.60	68.3	Emission rates are captured by another modeled commissioning or operation scenario			
	7FA02	8.60	68.3				
	Aux Boiler	0.054	0.42				
GE 7FA.05, 80% Load	7FA01	7.94	63.0				
	7FA02	7.94	63.0				
	Aux Boiler	0.054	0.42				
GE LMS 100PB, 5% Load	7FA01	7.69	61.0	41.0	325	12.0	95.2
	7FA02	7.69	61.0	41.0	325	12.0	95.2
	LMS01	5.05	40.1	30.7	244	30.7	244
	LMS02	5.05	40.1	30.7	244	30.7	244
	Aux Boiler	0.054	0.42	0.36	2.83	0.30	2.37
GE LMS 100PB, 75% Load	7FA01	Emission rates are captured by another modeled commissioning or operation scenario		41.0	325	12.0	95.2
	7FA02			41.0	325	12.0	95.2
	LMS01			9.13	72.5	9.13	72.5
	LMS02			9.13	72.5	9.13	72.5
	Aux Boiler			0.36	2.83	0.30	2.37
GE LMS 100PB, Full Load	7FA01			41.0	325	12.0	95.2
	7FA02			41.0	325	12.0	95.2
	LMS01			11.3	90.0	11.3	90.0
	LMS02			11.3	90.0	11.3	90.0
	Aux Boiler			0.36	2.83	0.30	2.37

Annual Pollutant Commissioning Emissions

		Annual NO_2		Annual PM_{10}		Annual $PM_{2.5}$	
Scenario	Source ID	(g/s)	(lb/hr)	(g/s)	(lb/hr)	(g/s)	(lb/hr)
GE 7FA.05 [b]	7FA01	1.42	11.3	0.93	7.38	0.93	7.38
	7FA02	1.42	11.3	0.93	7.38	0.93	7.38
	Aux Boiler	0.030	0.23	0.019	0.15	0.019	0.15
GE LMS 100PB [c]	7FA01	1.02	8.12	0.81	6.42	0.81	6.42
	7FA02	1.02	8.12	0.81	6.42	0.81	6.42
	LMS01	0.35	2.76	0.21	1.63	0.21	1.63
	LMS02	0.35	2.76	0.21	1.63	0.21	1.63
	Aux Boiler	0.030	0.23	0.019	0.15	0.019	0.15

[a] This table contains the same information presented in Appendix 5.1C, Table 5.1C.5 of the HBEP PTA, with the exception of all emission rates for the auxiliary boiler; the GE 7FA.05, 10% load scenario; and all annual emission rates.

[b] GE 7FA.05 annual emissions include emissions from commissioning as well as annual operation.
[c] GE LMS 100PB annual emissions include emissions from commissioning as well as annual operation.

Amended Huntington Beach Energy Project
Appendix B, Table 3
Commissioning Building Parameters
December 2015

GE 7FA.05 Commissioning Scenarios

Building Name	Number of Tiers	Tier Number	Base Elevation (m)	Tier Height (m)	Number of Corners	Corner 1 East (X) (m)	Corner 1 North (Y) (m)	Corner 2 East (X) (m)	Corner 2 North (Y) (m)	Corner 3 East (X) (m)	Corner 3 North (Y) (m)	Corner 4 East (X) (m)	Corner 4 North (Y) (m)	Corner 5 East (X) (m)	Corner 5 North (Y) (m)	Corner 6 East (X) (m)	Corner 6 North (Y) (m)	Corner 7 East (X) (m)	Corner 7 North (Y) (m)	Corner 8 East (X) (m)	Corner 8 North (Y) (m)	Corner 9 East (X) (m)	Corner 9 North (Y) (m)
'AIRIN3'	1	-	3.66	21.6	9	409385	3723198	409377	3723187	409384	3723182	409387	3723182	409395	3723177	409401	3723185	409393	3723191	409391	3723194	409385	3723198
'AIRIN4'	1	-	3.66	21.6	9	409426	3723221	409421	3723213	409412	3723218	409409	3723219	409402	3723223	409410	3723234	409416	3723230	409418	3723227	409426	3723221
'HRSG1'	1	-	3.66	25.6	5	409424	3723169	409447	3723152	409443	3723145	409418	3723162	409424	3723169								
'HRSG2'	1	-	3.66	25.6	5	409449	3723205	409473	3723188	409468	3723182	409444	3723198	409449	3723205								
'ACC'	1	-	3.66	33.5	5	409549	3723302	409551	3723173	409512	3723173	409510	3723301	409549	3723302								
'STG'	1	-	3.66	17.9	5	409482	3723251	409490	3723251	409490	3723235	409482	3723235	409482	3723251								
'WALL1'	1	-	3.66	15.2	9	409566	3723274	409567	3723158	409519	3723157	409437	3723109	409436	3723110	409519	3723158	409566	3723159	409565	3723274	409566	3723274
'WALL2'	1	-	3.66	6.10	7	409447	3723302	409427	3723301	409402	3723266	409402	3723265	409427	3723301	409447	3723301	409447	3723301				
'UNIT1L1'	2	1	3.66	23.2	4	409293	3723102	409312	3723128	409335	3723112	409317	3723086										
'UNIT1L2'	-	2	3.66	37.6	4	409301	3723114	409312	3723128	409335	3723112	409326	3723098										
'UNIT2L1'	2	1	3.66	23.2	4	409252	3723127	409272	3723153	409295	3723137	409277	3723111										
'UNIT2L2'	-	2	3.66	37.6	4	409261	3723139	409272	3723153	409295	3723137	409285	3723123										
'UNIT3L1'	2	1	3.66	23.2	4	409187	3723175	409206	3723202	409229	3723186	409211	3723159										
'UNIT3L2'	-	2	3.66	37.6	4	409195	3723187	409206	3723202	409229	3723186	409220	3723172										
'UNIT4L1'	2	1	3.66	23.2	4	409146	3723201	409165	3723228	409188	3723212	409170	3723185										
'UNIT4L2'	-	2	3.66	37.6	4	409154	3723213	409165	3723228	409188	3723212	409179	3723198										

Cylindical Building Name	Base Elevation (m)	Center East (X) (m)	Center North (Y) (m)	Tank Height (m)	Tank Diameter (m)
Stack12	3.66	409274	3723095	61.0	6.27
Stack34	3.66	409165	3723168	61.0	6.27

Amended Huntington Beach Energy Project
Appendix B, Table 3
Commissioning Building Parameters
December 2015

GE LMS 100PB Commissioning Scenarios

Building Name	Number of Tiers	Tier Number	Base Elevation (m)	Tier Height (m)	Number of Corners	Corner 1 East (X) (m)	Corner 1 North (Y) (m)	Corner 2 East (X) (m)	Corner 2 North (Y) (m)	Corner 3 East (X) (m)	Corner 3 North (Y) (m)	Corner 4 East (X) (m)	Corner 4 North (Y) (m)	Corner 5 East (X) (m)	Corner 5 North (Y) (m)	Corner 6 East (X) (m)	Corner 6 North (Y) (m)	Corner 7 East (X) (m)	Corner 7 North (Y) (m)	Corner 8 East (X) (m)	Corner 8 North (Y) (m)	Corner 9 East (X) (m)	Corner 9 North (Y) (m)
'AIRIN3'	1	-	3.66	21.6	9	409385	3723198	409377	3723187	409384	3723182	409387	3723182	409395	3723177	409401	3723185	409393	3723191	409391	3723194	409385	3723198
'AIRIN4'	1	-	3.66	21.6	9	409426	3723221	409421	3723213	409412	3723218	409409	3723219	409402	3723223	409410	3723234	409416	3723230	409418	3723227	409426	3723221
'HRSG1'	1	-	3.66	25.6	5	409424	3723169	409447	3723152	409443	3723145	409418	3723162	409424	3723169								
'HRSG2'	1	-	3.66	25.6	5	409449	3723205	409473	3723188	409468	3723182	409444	3723198	409449	3723205								
'ACC'	1	-	3.66	33.5	5	409549	3723302	409551	3723173	409512	3723173	409510	3723301	409549	3723302								
'STG'	1	-	3.66	17.9	5	409482	3723251	409490	3723251	409490	3723235	409482	3723235	409482	3723251								
'WALL1'	1	-	3.66	15.2	9	409566	3723274	409567	3723158	409519	3723157	409437	3723109	409436	3723110	409519	3723158	409566	3723159	409565	3723274	409566	3723274
'WALL2'	1	-	3.66	6.10	7	409447	3723302	409427	3723301	409402	3723266	409402	3723265	409427	3723301	409447	3723301	409447	3723301				
'UNIT1L1'	2	1	3.66	23.2	4	409293	3723102	409312	3723128	409335	3723112	409317	3723086										
'UNIT1L2'	-	2	3.66	37.6	4	409301	3723114	409312	3723128	409335	3723112	409326	3723098										
'UNIT2L1'	2	1	3.66	23.2	4	409252	3723127	409272	3723153	409295	3723137	409277	3723111										
'UNIT2L2'	-	2	3.66	37.6	4	409261	3723139	409272	3723153	409295	3723137	409285	3723123										
'AIRIN1'	1	-	3.66	15.6	5	409161	3723216	409148	3723225	409142	3723217	409155	3723207	409161	3723216								
'AIRIN2'	1	-	3.66	15.6	5	409196	3723179	409202	3723187	409216	3723178	409210	3723169	409196	3723179								
'CTG1'	1	-	3.66	9.45	7	409160	3723207	409158	3723209	409151	3723201	409147	3723197	409153	3723193	409156	3723198	409160	3723207				
'CTG2'	1	-	3.66	9.45	7	409194	3723184	409197	3723182	409192	3723172	409190	3723168	409184	3723172	409187	3723176	409194	3723184				

Cylindical Building Name	Base Elevation (m)	Center East (X) (m)	Center North (Y) (m)	Tank Height (m)	Tank Diameter (m)
Stack12	3.66	409274	3723095	61.0	6.27

This table contains the same information presented in Appendix 5.1C, Table 5.1C.6 of the HBEP PTA.

Amended Huntington Beach Energy Project
Appendix B, Table 4
Commissioning Results
December 2015

Short-Term Pollutant Commissioning Results

Scenario	Year	NO_2 ($\mu g/m^3$) [a]	CO ($\mu g/m^3$)	
		1-hour	1-hour	8-hour
GE 7FA.05, 10% Load [b]	2010	159	4,094	3,000
	2011	151	3,993	2,734
	2012	161	4,309	2,972
	2013	169	4,249	2,807
	2014	169	4,341	2,787
GE 7FA.05, 40% Load	2010	65.7	-	-
	2011	63.0	-	-
	2012	64.9	-	-
	2013	67.6	-	-
	2014	72.7	-	-
GE 7FA.05, 80% Load	2010	42.6	-	-
	2011	35.3	-	-
	2012	45.3	-	-
	2013	31.6	-	-
	2014	44.7	-	-
GE LMS 100PB, 5% Load [c]	2010	75.6	504	117
	2011	75.9	506	117
	2012	79.0	527	115
	2013	77.3	515	125
	2014	79.1	527	126
GE LMS 100PB, 75% Load [c]	2010	-	503	95.9
	2011	-	506	91.2
	2012	-	526	99.5
	2013	-	514	96.5
	2014	-	526	90.9
GE LMS 100PB, Full Load [c]	2010	-	503	96.5
	2011	-	506	91.3
	2012	-	526	100
	2013	-	515	96.6
	2014	-	526	91.8

[a] The maximum 1-hour NO_2 concentrations include an ambient NO_2 ratio of 0.80 (EPA, 2011), unless otherwise noted.
[b] 1-hour NO_2 impacts were modeled using the Plume Volume Molar Ratio Method.

[c] The modeled impacts for the GE LMS 100PB commissioning scenarios include impacts from the auxiliary boiler and the GE 7FA.05 turbines operating in emissions scenario CC03.

Annual Pollutant Commissioning Results

Scenario	Year	NO_2 ($\mu g/m^3$) [d]	PM_{10} ($\mu g/m^3$)	$PM_{2.5}$ ($\mu g/m^3$)
		Annual	Annual	Annual
GE 7FA.05 [e]	2010	0.58	0.51	0.51
	2011	0.60	0.52	0.52
	2012	0.66	0.57	0.57
	2013	0.66	0.57	0.57
	2014	0.65	0.57	0.57
GE LMS 100PB [f]	2010	0.44	0.46	0.46
	2011	0.46	0.48	0.48
	2012	0.50	0.52	0.52
	2013	0.50	0.52	0.52
	2014	0.50	0.52	0.52

[d] The maximum annual NO_2 concentrations include an ambient NO_2 ratio of 0.75 (EPA, 2005).

[e] Annual commissioning impacts are based on total emissions from commissioning and annual operation of 2 GE 7FA.05 turbines operating in exhaust scenario CC07 and the auxiliary boiler.

[f] Annual commissioning impacts are based on total emissions from operation of 2 GE 7FA.05 turbines operating in exhaust scenario CC07 and the auxiliary boiler, and commissioning and annual operation of 2 GE LMS 100PB turbines operating in exhaust scenario SC06 for NO_2 and SC07 for PM_{10} and $PM_{2.5}$.

Appendix C
Air Quality Impact Analysis—Operation

Amended Huntington Beach Energy Project
Appendix C, Table 1
Operational Stack Parameters
December 2015

Point Sources

Exhaust Scenario	Turbine Load (%)	Source ID	Easting (X) (m)	Northing (Y) (m)	Base Elevation (m)	Stack Height (m)	Temperature (K)	Exit Velocity (m/s)	Stack Diameter (m)
CC01	100	GE 7FA.05-01	409449	3723146	3.66	45.7	375	20.4	6.10
	100	GE 7FA.05-02	409474	3723182	3.66	45.7	375	20.4	6.10
CC02	75	GE 7FA.05-01	409449	3723146	3.66	45.7	354	15.6	6.10
	75	GE 7FA.05-02	409474	3723182	3.66	45.7	354	15.6	6.10
CC03	45	GE 7FA.05-01	409449	3723146	3.66	45.7	350	12.2	6.10
	45	GE 7FA.05-02	409474	3723182	3.66	45.7	350	12.2	6.10
CC04	100	GE 7FA.05-01	409449	3723146	3.66	45.7	374	20.1	6.10
	100	GE 7FA.05-02	409474	3723182	3.66	45.7	374	20.1	6.10
CC05	100	GE 7FA.05-01	409449	3723146	3.66	45.7	375	20.2	6.10
	100	GE 7FA.05-02	409474	3723182	3.66	45.7	375	20.2	6.10
CC06	75	GE 7FA.05-01	409449	3723146	3.66	45.7	353	14.9	6.10
	75	GE 7FA.05-02	409474	3723182	3.66	45.7	353	14.9	6.10
CC07	44	GE 7FA.05-01	409449	3723146	3.66	45.7	350	11.8	6.10
	44	GE 7FA.05-02	409474	3723182	3.66	45.7	350	11.8	6.10
CC08	100	GE 7FA.05-01	409449	3723146	3.66	45.7	378	20.2	6.10
	100	GE 7FA.05-02	409474	3723182	3.66	45.7	378	20.2	6.10
CC09	100	GE 7FA.05-01	409449	3723146	3.66	45.7	379	18.0	6.10
	100	GE 7FA.05-02	409474	3723182	3.66	45.7	379	18.0	6.10
CC10	75	GE 7FA.05-01	409449	3723146	3.66	45.7	365	13.9	6.10
	75	GE 7FA.05-02	409474	3723182	3.66	45.7	365	13.9	6.10
CC11	48	GE 7FA.05-01	409449	3723146	3.66	45.7	358	12.1	6.10
	48	GE 7FA.05-02	409474	3723182	3.66	45.7	358	12.1	6.10
SC01	100	GE LMS 100PB-01	409149	3723193	3.66	24.4	694	33.3	4.11
	100	GE LMS 100PB-02	409185	3723168	3.66	24.4	694	33.3	4.11
SC02	75	GE LMS 100PB-01	409149	3723193	3.66	24.4	709	28.7	4.11
	75	GE LMS 100PB-02	409185	3723168	3.66	24.4	709	28.7	4.11
SC03	50	GE LMS 100PB-01	409149	3723193	3.66	24.4	748	23.8	4.11
	50	GE LMS 100PB-02	409185	3723168	3.66	24.4	748	23.8	4.11
SC04	100	GE LMS 100PB-01	409149	3723193	3.66	24.4	697	33.1	4.11
	100	GE LMS 100PB-02	409185	3723168	3.66	24.4	697	33.1	4.11
SC05	100	GE LMS 100PB-01	409149	3723193	3.66	24.4	699	33.0	4.11
	100	GE LMS 100PB-02	409185	3723168	3.66	24.4	699	33.0	4.11
SC06	75	GE LMS 100PB-01	409149	3723193	3.66	24.4	709	28.4	4.11
	75	GE LMS 100PB-02	409185	3723168	3.66	24.4	709	28.4	4.11
SC07	50	GE LMS 100PB-01	409149	3723193	3.66	24.4	748	23.6	4.11
	50	GE LMS 100PB-02	409185	3723168	3.66	24.4	748	23.6	4.11
SC08	100	GE LMS 100PB-01	409149	3723193	3.66	24.4	726	29.4	4.11
	100	GE LMS 100PB-02	409185	3723168	3.66	24.4	726	29.4	4.11
SC09	100	GE LMS 100PB-01	409149	3723193	3.66	24.4	746	27.1	4.11
	100	GE LMS 100PB-02	409185	3723168	3.66	24.4	746	27.1	4.11
SC10	75	GE LMS 100PB-01	409149	3723193	3.66	24.4	769	23.7	4.11
	75	GE LMS 100PB-02	409185	3723168	3.66	24.4	769	23.7	4.11
SC11	50	GE LMS 100PB-01	409149	3723193	3.66	24.4	809	20.0	4.11
	50	GE LMS 100PB-02	409185	3723168	3.66	24.4	809	20.0	4.11
AB	100	Auxiliary Boiler	409438	3723236	3.66	24.4	432	21.2	0.91

This table contains the same information presented in Appendix 5.1C, Table 5.1C.8 of the HBEP PTA, with the exception of the turbine load.

Amended Huntington Beach Energy Project

Appendix C, Table 2 [a]

Operational Emission Rates

December 2015

GE 7FA.05 Per Turbine Emission Rates

Exhaust	1-hour NO_2 [b]		1-hour CO [b]		8-hour CO [c]		1-hour SO_2		3-hour SO_2		24-hour SO_2		24-hour PM_{10}		24-hour $PM_{2.5}$		Annual NO_2 [d]		Annual PM_{10}		Annual $PM_{2.5}$	
Scenario	(g/s)	(lb/hr)	(g/s)	(lb/hr)	(g/s)	(lb/hr)	(g/s)	(lb/hr)	(g/s)	(lb/hr)	(g/s)	(lb/hr)	(g/s)	(lb/hr)	(g/s)	(lb/hr)	(g/s)	(lb/hr)	(g/s)	(lb/hr)	(g/s)	(lb/hr)
CC01	7.69	61.0	41.0	325	12.3	97.9	0.61	4.86	0.61	4.86	0.61	4.86	1.07	8.50	1.07	8.50	-	-	-	-	-	-
CC02	7.69	61.0	41.0	325	12.2	96.4	0.48	3.84	0.48	3.84	0.48	3.84	1.07	8.50	1.07	8.50	-	-	-	-	-	-
CC03	7.69	61.0	41.0	325	12.0	95.2	0.37	2.95	0.37	2.95	0.37	2.95	1.07	8.50	1.07	8.50	-	-	-	-	-	-
CC04	7.18	57.0	36.2	287	11.0	87.5	0.61	4.81	0.61	4.81	0.61	4.81	1.07	8.50	1.07	8.50	1.63	13.0	0.81	6.42	0.81	6.42
CC05	7.18	57.0	36.2	287	11.0	87.4	0.60	4.78	0.60	4.78	0.60	4.78	1.07	8.50	1.07	8.50	1.61	12.8	0.81	6.42	0.81	6.42
CC06	7.18	57.0	36.2	287	10.8	85.9	0.47	3.72	0.47	3.72	0.47	3.72	1.07	8.50	1.07	8.50	1.30	10.3	0.81	6.42	0.81	6.42
CC07	7.18	57.0	36.2	287	10.7	84.6	0.35	2.79	0.35	2.79	0.35	2.79	1.07	8.50	1.07	8.50	1.02	8.12	0.81	6.42	0.81	6.42
CC08	6.68	53.0	27.7	220	8.80	69.9	0.58	4.60	0.58	4.60	0.58	4.60	1.07	8.50	1.07	8.50	-	-	-	-	-	-
CC09	6.68	53.0	27.7	220	8.72	69.2	0.52	4.16	0.52	4.16	0.52	4.16	1.07	8.50	1.07	8.50	-	-	-	-	-	-
CC10	6.68	53.0	27.7	220	8.57	68.0	0.42	3.33	0.42	3.33	0.42	3.33	1.07	8.50	1.07	8.50	-	-	-	-	-	-
CC11	6.68	53.0	27.7	220	8.46	67.1	0.34	2.67	0.34	2.67	0.34	2.67	1.07	8.50	1.07	8.50	-	-	-	-	-	-

GE LMS 100PB Per Turbine Emission Rates

Exhaust	1-hour NO_2 [e]		1-hour CO [f]		8-hour CO [e]		1-hour SO_2		3-hour SO_2		24-hour SO_2		24-hour PM_{10}		24-hour $PM_{2.5}$		Annual NO_2 [g]		Annual PM_{10}		Annual $PM_{2.5}$	
Scenario	(g/s)	(lb/hr)	(g/s)	(lb/hr)	(g/s)	(lb/hr)	(g/s)	(lb/hr)	(g/s)	(lb/hr)	(g/s)	(lb/hr)	(g/s)	(lb/hr)	(g/s)	(lb/hr)	(g/s)	(lb/hr)	(g/s)	(lb/hr)	(g/s)	(lb/hr)
SC01	2.78	22.0	5.77	45.8	2.20	17.5	0.20	1.63	0.20	1.63	0.20	1.63	0.79	6.24	0.79	6.24	-	-	-	-	-	-
SC02	2.72	21.6	5.71	45.3	2.04	16.2	0.17	1.32	0.17	1.32	0.17	1.32	0.79	6.24	0.79	6.24	-	-	-	-	-	-
SC03	2.67	21.2	5.66	44.9	1.89	15.0	0.13	1.02	0.13	1.02	0.13	1.02	0.79	6.24	0.79	6.24	-	-	-	-	-	-
SC04	2.78	22.1	5.77	45.8	2.20	17.5	0.21	1.64	0.21	1.64	0.21	1.64	0.79	6.24	0.79	6.24	0.31	2.44	0.18	1.43	0.18	1.43
SC05	2.77	22.0	5.76	45.7	2.19	17.4	0.20	1.61	0.20	1.61	0.20	1.61	0.79	6.24	0.79	6.24	0.30	2.42	0.18	1.43	0.18	1.43
SC06	2.72	21.6	5.71	45.3	2.04	16.2	0.16	1.31	0.16	1.31	0.16	1.31	0.79	6.24	0.79	6.24	0.27	2.11	0.18	1.43	0.18	1.43
SC07	2.67	21.2	5.66	44.9	1.89	15.0	0.13	1.01	0.13	1.01	0.13	1.01	0.79	6.24	0.79	6.24	0.23	1.81	0.18	1.43	0.18	1.43
SC08	2.73	21.7	5.72	45.4	2.06	16.4	0.17	1.36	0.17	1.36	0.17	1.36	0.79	6.24	0.79	6.24	-	-	-	-	-	-
SC09	2.70	21.5	5.69	45.2	1.99	15.8	0.15	1.22	0.15	1.22	0.15	1.22	0.79	6.24	0.79	6.24	-	-	-	-	-	-
SC10	2.67	21.2	5.66	44.9	1.89	15.0	0.13	1.01	0.13	1.01	0.13	1.01	0.79	6.24	0.79	6.24	-	-	-	-	-	-
SC11	2.63	20.9	5.62	44.6	1.78	14.1	0.10	0.80	0.10	0.80	0.10	0.80	0.79	6.24	0.79	6.24	-	-	-	-	-	-

Auxiliary Boiler Emission Rates

Exhaust	1-hour NO_2		1-hour CO		8-hour CO		1-hour SO_2		3-hour SO_2		24-hour SO_2		24-hour PM_{10}		24-hour $PM_{2.5}$		Annual NO_2		Annual PM_{10}		Annual $PM_{2.5}$	
Scenario	(g/s)	(lb/hr)	(g/s)	(lb/hr)	(g/s)	(lb/hr)	(g/s)	(lb/hr)	(g/s)	(lb/hr)	(g/s)	(lb/hr)	(g/s)	(lb/hr)	(g/s)	(lb/hr)	(g/s)	(lb/hr)	(g/s)	(lb/hr)	(g/s)	(lb/hr)
AB	0.054	0.42	0.36	2.83	0.30	2.37	0.0061	0.048	0.0061	0.048	0.003	0.025	0.020	0.157	0.020	0.157	0.030	0.23	0.019	0.15	0.019	0.15

[a] This table contains the same information presented in Appendix 5.1C, Table 5.1C.9 of the HBEP PTA, with the exception of all auxiliary boiler emission rates, GE LMS 100PB annual emission rates, and GE 7FA.05 PM_{10}/$PM_{2.5}$ emission rates.

[b] Hourly CO and NO_2 emission rates for the GE 7FA.05s are based on cold startup events.

[c] 8-hour CO emission rates for the GE 7FA.05s are based on one cold start, one warm start, two shutdowns, and the balance of the period at steady-state operation.

[d] Annual emission rates for the GE 7FA.05s are based on 24 cold startups, 100 warm startups, 376 hot startups, 500 shutdowns, and 6,100 hours of steady-state operation.

[e] Hourly CO and NO_2 emission rates for the GE LMS 100PBs are based on one startup, one shutdown, and the balance of the hour at steady-state operation.

[f] 8-hour CO emission rates for the GE LMS 100PBs are based on two startups, two shutdowns, and the balance of the period at steady-state operation.

[g] Annual emission rates for the GE LMS 100PBs are based on 350 hot startups, 350 shutdowns, and 1,750 hours of steady-state operation.

Amended Huntington Beach Energy Project
Appendix C, Table 3
Operational Building Parameters
December 2015

Building Name	Number of Tiers	Tier Number	Base Elevation (m)	Tier Height (m)	Number of Corners	Corner 1 East (X) (m)	Corner 1 North (Y) (m)	Corner 2 East (X) (m)	Corner 2 North (Y) (m)	Corner 3 East (X) (m)	Corner 3 North (Y) (m)	Corner 4 East (X) (m)	Corner 4 North (Y) (m)	Corner 5 East (X) (m)	Corner 5 North (Y) (m)	Corner 6 East (X) (m)	Corner 6 North (Y) (m)	Corner 7 East (X) (m)	Corner 7 North (Y) (m)	Corner 8 East (X) (m)	Corner 8 North (Y) (m)	Corner 9 East (X) (m)	Corner 9 North (Y) (m)
'AIRIN3'	1	-	3.66	21.6	9	409385	3723198	409377	3723187	409384	3723182	409387	3723182	409395	3723177	409401	3723185	409393	3723191	409391	3723194	409385	3723198
'AIRIN4'	1	-	3.66	21.6	9	409426	3723221	409421	3723213	409412	3723218	409409	3723219	409402	3723223	409410	3723234	409416	3723230	409418	3723227	409426	3723221
'HRSG1'	1	-	3.66	25.6	5	409424	3723169	409447	3723152	409443	3723145	409418	3723162	409424	3723169								
'HRSG2'	1	-	3.66	25.6	5	409449	3723205	409473	3723188	409468	3723182	409444	3723198	409449	3723205								
'ACC'	1	-	3.66	33.5	5	409549	3723302	409551	3723173	409512	3723173	409510	3723301	409549	3723302								
'STG'	1	-	3.66	17.9	5	409482	3723251	409490	3723251	409490	3723235	409482	3723235	409482	3723251								
'WALL1'	1	-	3.66	15.2	9	409566	3723274	409567	3723158	409519	3723157	409437	3723109	409436	3723110	409519	3723158	409566	3723159	409565	3723274	409566	3723274
'WALL2'	1	-	3.66	6.1	7	409447	3723302	409427	3723301	409402	3723266	409402	3723265	409427	3723301	409447	3723301	409447	3723301				
'AIRIN1'	1	-	3.66	15.6	5	409161	3723216	409148	3723225	409142	3723217	409155	3723207	409161	3723216								
'AIRIN2'	1	-	3.66	15.6	5	409196	3723179	409202	3723187	409216	3723178	409210	3723169	409196	3723179								
'CTG1'	1	-	3.66	9.4	7	409160	3723207	409158	3723209	409151	3723201	409147	3723197	409153	3723193	409156	3723198	409160	3723207				
'CTG2'	1	-	3.66	9.4	7	409194	3723184	409197	3723182	409192	3723172	409190	3723168	409184	3723172	409187	3723176	409194	3723184				

This table contains the same information presented in Appendix 5.1C, Table 5.1C.10 of the HBEP PTA.

Amended Huntington Beach Energy Project
Appendix C, Table 4
Operational Results – Load Analysis
December 2015

32°F Ambient Temperature Scenarios

Scenario Description [a]	Exhaust Scenario	Year	NO_2 (µg/m^3) [b]		CO (µg/m^3)		SO_2 (µg/m^3)				PM_{10} (µg/m^3)	$PM_{2.5}$ (µg/m^3)
			1-hour	1-hour (federal) [c]	1-hour	8-hour	1-hour	1-hour (federal)	3-hour	24-hour	24-hour	24-hour
GE 7FA.05 100% Load/ GE LMS 100PB 100% Load	CC01/SC01/AB	2010	43.2	102	288	28.6	4.28	2.08	2.95	0.55	1.10	0.72
		2011	22.2	105	148	25.1	2.20	1.80	1.59	0.43	0.86	0.73
		2012	43.0	102	287	26.2	4.26	1.75	1.69	0.63	1.20	0.74
		2013	21.6	103	144	26.3	2.14	1.78	1.61	0.48	0.97	0.75
		2014	41.5	103	276	27.4	4.11	2.14	2.25	0.53	1.04	0.79
GE 7FA.05 100% Load/ GE LMS 100PB 75% Load	CC01/SC02/AB	2010	43.2	102	288	28.6	4.28	2.08	2.95	0.55	1.10	0.72
		2011	22.2	105	148	25.2	2.20	1.80	1.59	0.43	0.87	0.75
		2012	43.0	103	287	26.2	4.26	1.75	1.69	0.63	1.21	0.76
		2013	21.6	103	144	26.3	2.14	1.78	1.61	0.48	0.98	0.77
		2014	41.5	103	276	27.4	4.11	2.14	2.25	0.53	1.05	0.81
GE 7FA.05 100% Load/ GE LMS 100PB 50% Load	CC01/SC03/AB	2010	43.2	102	288	28.6	4.28	2.08	2.95	0.55	1.10	0.73
		2011	22.2	105	148	25.2	2.20	1.80	1.59	0.42	0.88	0.77
		2012	43.0	103	287	26.2	4.26	1.75	1.69	0.63	1.23	0.77
		2013	21.7	103	144	26.4	2.14	1.78	1.60	0.48	0.99	0.80
		2014	41.5	103	276	27.5	4.11	2.14	2.25	0.53	1.07	0.85
GE 7FA.05 75% Load/ GE LMS 100PB 100% Load	CC02/SC01/AB	2010	64.4	118	430	61.9	5.07	4.31	4.16	1.20	2.81	1.28
		2011	58.0	108	387	54.5	4.52	3.76	3.44	0.70	1.66	1.27
		2012	68.9	108	459	66.0	5.37	3.73	3.61	1.05	2.42	1.47
		2013	57.8	105	385	65.4	4.51	3.81	3.84	0.89	2.12	1.28
		2014	67.8	106	452	60.5	5.28	4.24	4.07	1.01	2.44	1.35
GE 7FA.05 75% Load/ GE LMS 100PB 75% Load	CC02/SC02/AB	2010	64.4	118	430	61.9	5.07	4.31	4.16	1.20	2.81	1.28
		2011	58.0	109	387	54.5	4.52	3.76	3.44	0.70	1.67	1.28
		2012	68.9	108	459	66.1	5.37	3.73	3.61	1.05	2.42	1.48
		2013	57.8	105	385	65.5	4.51	3.81	3.84	0.89	2.13	1.28
		2014	67.8	106	452	60.5	5.28	4.24	4.07	1.01	2.45	1.36
GE 7FA.05 75% Load/ GE LMS 100PB 50% Load	CC02/SC03/AB	2010	64.4	118	430	61.9	5.07	4.31	4.16	1.20	2.81	1.29
		2011	58.0	109	387	54.5	4.52	3.76	3.44	0.70	1.68	1.29
		2012	68.9	108	459	66.1	5.37	3.73	3.61	1.05	2.44	1.48
		2013	57.8	105	385	65.5	4.51	3.81	3.84	0.89	2.13	1.29
		2014	67.8	106	452	60.5	5.28	4.24	4.06	1.01	2.46	1.37
GE 7FA.05 45% Load/ GE LMS 100PB 100% Load	CC03/SC01/AB	2010	89.0	140	594	114	5.41	4.81	4.35	1.52	4.51	2.53
		2011	85.2	122	569	107	5.20	4.66	4.56	1.20	3.60	2.60
		2012	89.8	128	599	121	5.48	4.84	5.01	1.51	4.40	2.81
		2013	88.4	117	590	105	5.40	4.92	4.81	1.35	3.98	2.86
		2014	94.5	123	630	109	5.76	5.05	4.70	1.53	4.57	3.11
GE 7FA.05 45% Load/ GE LMS 100PB 75% Load	CC03/SC02/AB	2010	89.0	140	594	114	5.41	4.81	4.35	1.52	4.51	2.53
		2011	85.2	122	569	107	5.20	4.66	4.56	1.20	3.60	2.60
		2012	89.8	128	600	121	5.48	4.84	5.01	1.51	4.40	2.82
		2013	88.5	117	591	105	5.40	4.92	4.81	1.35	3.98	2.86
		2014	94.5	123	630	109	5.76	5.05	4.70	1.53	4.57	3.12
GE 7FA.05 45% Load/ GE LMS 100PB 50% Load	CC03/SC03/AB	2010	89.0	140	594	114	5.41	4.81	4.35	1.52	4.51	2.54
		2011	85.2	122	569	107	5.19	4.66	4.56	1.20	3.61	2.60
		2012	89.8	128	600	121	5.48	4.84	5.01	1.51	4.41	2.82
		2013	88.5	117	591	105	5.40	4.92	4.81	1.35	3.98	2.86
		2014	94.5	123	631	109	5.76	5.05	4.70	1.52	4.58	3.12

Amended Huntington Beach Energy Project
Appendix C, Table 4
Operational Results – Load Analysis
December 2015

65.8°F Ambient Temperature Scenarios

Scenario Description [a]	Exhaust Scenario	Year	NO_2 (µg/m^3) [b] 1-hour	NO_2 1-hour (federal) [c]	NO_2 Annual	CO (µg/m^3) 1-hour	CO 8-hour	SO_2 (µg/m^3) 1-hour	SO_2 1-hour (federal)	SO_2 3-hour	SO_2 24-hour	PM_{10} (µg/m^3) 24-hour	PM_{10} Annual	$PM_{2.5}$ (µg/m^3) 24-hour	$PM_{2.5}$ Annual
GE 7FA.05 100% Load with Evap./ GE LMS 100PB 100% Load with Evap.	CC04/SC04/AB	2010	41.0	102	0.29	258	27.2	4.35	2.27	3.05	0.58	1.16	0.23	0.73	0.23
		2011	22.2	105	0.32	140	23.0	2.36	1.86	1.54	0.44	0.88	0.25	0.74	0.25
		2012	41.7	102	0.33	263	25.4	4.43	1.71	1.77	0.68	1.28	0.26	0.76	0.26
		2013	21.0	102	0.35	132	24.2	2.23	1.86	1.71	0.49	0.98	0.27	0.76	0.27
		2014	40.1	103	0.36	253	25.2	4.26	2.25	2.36	0.55	1.06	0.28	0.80	0.28
GE 7FA.05 100% Load with Evap./ GE LMS 100PB 100% Load	CC04/SC05/AB	2010	41.0	102	0.29	258	27.2	4.35	2.27	3.05	0.58	1.16	0.23	0.73	0.23
		2011	22.2	105	0.32	140	23.0	2.36	1.86	1.54	0.44	0.88	0.25	0.74	0.25
		2012	41.7	102	0.33	263	25.4	4.43	1.71	1.77	0.68	1.28	0.26	0.76	0.26
		2013	21.0	102	0.35	132	24.2	2.23	1.86	1.71	0.49	0.98	0.27	0.76	0.27
		2014	40.1	103	0.36	253	25.2	4.26	2.25	2.36	0.55	1.06	0.28	0.80	0.28
GE 7FA.05 100% Load with Evap./ GE LMS 100PB 75% Load	CC04/SC06/AB	2010	41.0	102	0.29	258	27.2	4.35	2.27	3.05	0.58	1.16	0.24	0.75	0.24
		2011	22.2	105	0.32	140	23.1	2.36	1.86	1.54	0.43	0.89	0.25	0.76	0.25
		2012	41.7	102	0.33	263	25.4	4.43	1.71	1.77	0.67	1.29	0.26	0.77	0.26
		2013	21.0	103	0.35	132	24.2	2.23	1.86	1.71	0.49	0.99	0.27	0.78	0.27
		2014	40.1	103	0.36	253	25.2	4.26	2.25	2.36	0.54	1.08	0.28	0.82	0.28
GE 7FA.05 100% Load with Evap./ GE LMS 100PB 50% Load	CC04/SC07/AB	2010	41.0	102	0.29	258	27.2	4.35	2.27	3.05	0.58	1.16	0.24	0.76	0.24
		2011	22.2	105	0.32	140	23.1	2.36	1.86	1.53	0.43	0.91	0.26	0.78	0.26
		2012	41.7	102	0.33	263	25.4	4.43	1.71	1.77	0.67	1.31	0.26	0.78	0.26
		2013	21.0	103	0.35	132	24.3	2.23	1.86	1.71	0.48	1.01	0.28	0.81	0.28
		2014	40.1	103	0.36	253	25.2	4.26	2.25	2.36	0.54	1.10	0.28	0.86	0.28
GE 7FA.05 100% Load/ GE LMS 100PB 100% Load with Evap.	CC05/SC04/AB	2010	40.8	102	0.29	257	26.9	4.26	2.16	2.98	0.56	1.14	0.23	0.72	0.23
		2011	21.4	105	0.32	135	22.8	2.24	1.90	1.53	0.42	0.86	0.25	0.74	0.25
		2012	41.1	102	0.32	259	25.2	4.30	1.66	1.70	0.66	1.27	0.26	0.75	0.26
		2013	20.7	102	0.35	130	24.0	2.16	1.81	1.64	0.48	0.97	0.27	0.75	0.27
		2014	39.6	103	0.35	250	25.0	4.14	2.14	2.28	0.53	1.05	0.27	0.79	0.27
GE 7FA.05 100% Load/ GE LMS 100PB 100% Load	CC05/SC05/AB	2010	40.8	102	0.29	257	26.9	4.26	2.16	2.98	0.56	1.14	0.23	0.72	0.23
		2011	21.4	105	0.32	135	22.8	2.24	1.90	1.53	0.42	0.86	0.25	0.74	0.25
		2012	41.1	102	0.32	259	25.2	4.30	1.66	1.70	0.66	1.27	0.26	0.75	0.26
		2013	20.7	102	0.35	130	24.0	2.16	1.81	1.64	0.48	0.97	0.27	0.75	0.27
		2014	39.6	103	0.35	250	25.0	4.14	2.14	2.28	0.53	1.05	0.27	0.79	0.27
GE 7FA.05 100% Load/ GE LMS 100PB 75% Load	CC05/SC06/AB	2010	40.8	102	0.29	257	26.9	4.26	2.16	2.98	0.56	1.14	0.24	0.74	0.24
		2011	21.4	105	0.32	135	22.8	2.24	1.90	1.53	0.42	0.87	0.25	0.76	0.25
		2012	41.1	102	0.32	259	25.2	4.30	1.66	1.70	0.66	1.28	0.26	0.76	0.26
		2013	20.7	103	0.35	130	24.0	2.16	1.81	1.64	0.47	0.99	0.27	0.78	0.27
		2014	39.6	103	0.35	250	25.0	4.14	2.14	2.28	0.53	1.07	0.28	0.82	0.28
GE 7FA.05 100% Load/ GE LMS 100PB 50% Load	CC05/SC07/AB	2010	40.8	102	0.29	257	26.9	4.26	2.16	2.98	0.56	1.14	0.24	0.75	0.24
		2011	21.4	105	0.32	135	22.9	2.24	1.90	1.53	0.42	0.89	0.26	0.78	0.26
		2012	41.2	102	0.32	259	25.2	4.30	1.66	1.70	0.66	1.30	0.26	0.77	0.26
		2013	20.7	103	0.35	130	24.0	2.16	1.81	1.64	0.47	1.00	0.28	0.81	0.28
		2014	39.6	103	0.35	250	25.0	4.14	2.14	2.28	0.53	1.09	0.28	0.85	0.28

Amended Huntington Beach Energy Project
Appendix C, Table 4
Operational Results – Load Analysis
December 2015

65.8°F Ambient Temperature Scenarios

Scenario Description [a]	Exhaust Scenario	Year	NO_2 (µg/m³) [b]			CO (µg/m³)		SO_2 (µg/m³)				PM_{10} (µg/m³)		$PM_{2.5}$ (µg/m³)	
			1-hour	1-hour (federal) [c]	Annual	1-hour	8-hour	1-hour	1-hour (federal)	3-hour	24-hour	24-hour	Annual	24-hour	Annual
GE 7FA.05 75% Load/ GE LMS 100PB 100% Load with Evap.	CC06/SC04/AB	2010	65.1	121	0.41	412	65.1	5.37	4.60	4.33	1.32	3.13	0.34	1.49	0.34
		2011	58.6	109	0.43	370	56.7	4.80	4.12	3.83	0.81	1.95	0.36	1.39	0.36
		2012	67.5	108	0.46	426	72.6	5.52	4.13	4.00	1.11	2.66	0.38	1.57	0.38
		2013	55.7	105	0.48	351	66.9	4.56	4.17	4.26	1.00	2.42	0.40	1.52	0.40
		2014	67.1	107	0.49	423	68.2	5.49	4.59	4.34	1.26	3.05	0.41	1.46	0.41
GE 7FA.05 75% Load/ GE LMS 100PB 100% Load	CC06/SC05/AB	2010	65.1	121	0.41	412	65.1	5.37	4.60	4.33	1.32	3.13	0.34	1.49	0.34
		2011	58.6	109	0.43	370	56.7	4.80	4.12	3.83	0.81	1.95	0.36	1.39	0.36
		2012	67.5	108	0.45	426	72.6	5.52	4.13	4.00	1.11	2.66	0.38	1.57	0.38
		2013	55.7	105	0.48	351	66.9	4.56	4.17	4.26	1.00	2.42	0.40	1.52	0.40
		2014	67.1	107	0.49	423	68.2	5.49	4.59	4.34	1.26	3.05	0.41	1.46	0.41
GE 7FA.05 75% Load/ GE LMS 100PB 75% Load	CC06/SC06/AB	2010	65.1	121	0.41	412	65.1	5.37	4.60	4.33	1.32	3.13	0.34	1.49	0.34
		2011	58.7	109	0.43	370	56.8	4.80	4.12	3.83	0.81	1.96	0.36	1.40	0.36
		2012	67.5	108	0.46	426	72.6	5.52	4.13	4.00	1.11	2.67	0.38	1.58	0.38
		2013	55.7	105	0.48	351	66.9	4.56	4.17	4.26	1.00	2.42	0.40	1.52	0.40
		2014	67.1	107	0.49	423	68.2	5.49	4.59	4.33	1.26	3.06	0.41	1.47	0.41
GE 7FA.05 75% Load/ GE LMS 100PB 50% Load	CC06/SC07/AB	2010	65.1	121	0.41	412	65.1	5.37	4.59	4.33	1.32	3.13	0.34	1.50	0.34
		2011	58.7	109	0.43	370	56.8	4.80	4.12	3.83	0.81	1.97	0.36	1.41	0.36
		2012	67.5	108	0.46	426	72.6	5.52	4.13	4.00	1.11	2.68	0.39	1.59	0.39
		2013	55.7	105	0.48	351	66.9	4.56	4.17	4.26	1.00	2.43	0.41	1.52	0.41
		2014	67.1	107	0.49	423	68.2	5.49	4.59	4.33	1.26	3.07	0.42	1.48	0.42
GE 7FA.05 44% Load/ GE LMS 100PB 100% Load with Evap.	CC07/SC04/AB	2010	85.7	137	0.57	541	114	5.28	4.79	4.36	1.52	4.74	0.55	2.78	0.55
		2011	82.1	124	0.57	519	101	5.07	4.63	4.52	1.22	3.85	0.56	2.72	0.56
		2012	87.8	130	0.62	555	115	5.43	4.78	5.01	1.66	5.10	0.61	2.97	0.61
		2013	86.7	117	0.63	548	99.7	5.36	4.86	4.75	1.28	3.99	0.62	3.32	0.62
		2014	92.1	123	0.64	582	108	5.69	4.93	4.68	1.56	4.90	0.63	3.37	0.63
GE 7FA.05 44% Load/ GE LMS 100PB 100% Load	CC07/SC05/AB	2010	85.7	137	0.57	541	114	5.28	4.79	4.36	1.52	4.74	0.55	2.78	0.55
		2011	82.1	124	0.57	519	101	5.07	4.63	4.52	1.22	3.85	0.56	2.72	0.56
		2012	87.8	130	0.62	555	115	5.43	4.78	5.01	1.66	5.10	0.61	2.97	0.61
		2013	86.7	117	0.63	548	99.7	5.36	4.86	4.75	1.28	3.99	0.62	3.32	0.62
		2014	92.1	123	0.64	582	108	5.69	4.93	4.68	1.56	4.90	0.63	3.37	0.63
GE 7FA.05 44% Load/ GE LMS 100PB 75% Load	CC07/SC06/AB	2010	85.7	137	0.57	541	114	5.28	4.79	4.36	1.52	4.74	0.56	2.79	0.56
		2011	82.1	124	0.57	519	101	5.07	4.63	4.52	1.22	3.85	0.56	2.73	0.56
		2012	87.9	130	0.62	555	115	5.43	4.78	5.01	1.66	5.11	0.61	2.97	0.61
		2013	86.7	117	0.63	548	99.7	5.36	4.86	4.75	1.28	3.99	0.63	3.33	0.63
		2014	92.1	123	0.64	582	108	5.69	4.93	4.68	1.55	4.91	0.64	3.37	0.64
GE 7FA.05 44% Load/ GE LMS 100PB 50% Load	CC07/SC07/AB	2010	85.7	137	0.57	541	114	5.28	4.79	4.36	1.52	4.74	0.56	2.80	0.56
		2011	82.1	124	0.57	519	101	5.07	4.63	4.52	1.22	3.85	0.56	2.73	0.56
		2012	87.9	130	0.62	555	115	5.43	4.78	5.01	1.66	5.11	0.61	2.98	0.61
		2013	86.7	117	0.63	548	99.7	5.36	4.86	4.75	1.28	4.00	0.63	3.33	0.63
		2014	92.1	123	0.64	582	108	5.69	4.93	4.68	1.55	4.92	0.64	3.38	0.64

Amended Huntington Beach Energy Project
Appendix C, Table 4
Operational Results – Load Analysis
December 2015

110°F Ambient Temperature Scenarios

Scenario Description [a]	Exhaust Scenario	Year	NO_2 (µg/m^3) [b] 1-hour	NO_2 1-hour (federal) [c]	CO (µg/m^3) 1-hour	CO 8-hour	SO_2 (µg/m^3) 1-hour	SO_2 1-hour (federal)	SO_2 3-hour	SO_2 24-hour	PM_{10} (µg/m^3) 24-hour	$PM_{2.5}$ (µg/m^3) 24-hour
GE 7FA.05 100% Load with Evap./ GE LMS 100PB 100% Load with Evap.	CC08/SC08/AB	2010	37.8	102	196	22.2	4.11	2.01	2.83	0.53	1.11	0.72
		2011	19.3	104	100	18.7	2.09	1.74	1.45	0.40	0.86	0.74
		2012	37.4	102	194	19.3	4.06	1.67	1.61	0.60	1.21	0.75
		2013	18.8	102	97.1	19.3	2.03	1.66	1.52	0.45	0.97	0.76
		2014	36.3	102	188	20.4	3.94	2.07	2.15	0.50	1.04	0.80
GE 7FA.05 100% Load with Evap./ GE LMS 100PB 100% Load	CC08/SC09/AB	2010	37.8	102	196	22.2	4.11	2.01	2.83	0.53	1.11	0.72
		2011	19.3	104	100	18.7	2.09	1.74	1.45	0.40	0.87	0.75
		2012	37.4	102	194	19.3	4.06	1.67	1.61	0.60	1.22	0.76
		2013	18.8	102	97.1	19.3	2.03	1.66	1.52	0.45	0.97	0.77
		2014	36.3	102	188	20.4	3.94	2.07	2.15	0.50	1.05	0.81
GE 7FA.05 100% Load with Evap./ GE LMS 100PB 75% Load	CC08/SC10/AB	2010	37.8	102	196	22.2	4.11	2.01	2.83	0.53	1.11	0.73
		2011	19.3	104	100	18.7	2.09	1.74	1.45	0.40	0.88	0.77
		2012	37.4	102	194	19.3	4.06	1.67	1.61	0.60	1.23	0.76
		2013	18.8	102	97.2	19.3	2.03	1.66	1.52	0.45	0.98	0.80
		2014	36.3	102	188	20.4	3.94	2.07	2.15	0.50	1.06	0.84
GE 7FA.05 100% Load with Evap./ GE LMS 100PB 50% Load	CC08/SC11/AB	2010	37.8	102	196	22.2	4.11	2.01	2.83	0.53	1.11	0.74
		2011	19.3	105	100	18.8	2.09	1.74	1.44	0.40	0.89	0.79
		2012	37.4	102	194	19.3	4.06	1.66	1.60	0.60	1.24	0.77
		2013	18.9	102	97.3	19.4	2.02	1.65	1.51	0.45	1.00	0.83
		2014	36.3	102	188	20.5	3.94	2.07	2.15	0.49	1.08	0.88
GE 7FA.05 100% Load/ GE LMS 100PB 100% Load with Evap.	CC09/SC08/AB	2010	44.5	103	231	28.7	4.33	2.67	3.23	0.70	1.57	0.83
		2011	29.0	105	150	20.8	2.82	1.96	1.55	0.42	0.97	0.79
		2012	45.7	102	237	23.6	4.44	2.05	1.96	0.67	1.45	0.88
		2013	23.6	102	122	26.2	2.30	1.98	2.00	0.55	1.25	0.82
		2014	44.3	103	230	25.4	4.31	2.57	2.73	0.58	1.30	0.86
GE 7FA.05 100% Load/ GE LMS 100PB 100% Load	CC09/SC09/AB	2010	44.5	103	231	28.7	4.33	2.67	3.23	0.70	1.57	0.84
		2011	29.0	105	150	20.8	2.82	1.96	1.55	0.42	0.98	0.80
		2012	45.7	102	237	23.6	4.44	2.05	1.96	0.66	1.45	0.88
		2013	23.6	102	122	26.2	2.30	1.98	2.00	0.55	1.25	0.83
		2014	44.3	103	230	25.4	4.31	2.57	2.73	0.58	1.31	0.87
GE 7FA.05 100% Load/ GE LMS 100PB 75% Load	CC09/SC10/AB	2010	44.5	103	231	28.7	4.33	2.67	3.23	0.70	1.57	0.84
		2011	29.0	105	150	20.9	2.82	1.96	1.55	0.42	0.99	0.82
		2012	45.7	102	237	23.6	4.44	2.05	1.96	0.66	1.46	0.88
		2013	23.6	103	122	26.3	2.30	1.98	2.00	0.55	1.26	0.84
		2014	44.3	103	230	25.4	4.31	2.57	2.73	0.58	1.31	0.89
GE 7FA.05 100% Load/ GE LMS 100PB 50% Load	CC09/SC11/AB	2010	44.5	103	231	28.7	4.33	2.67	3.23	0.70	1.57	0.85
		2011	29.0	105	150	20.9	2.82	1.96	1.55	0.42	1.00	0.85
		2012	45.7	102	237	23.7	4.44	2.05	1.96	0.66	1.48	0.90
		2013	23.6	103	122	26.3	2.30	1.97	2.00	0.55	1.27	0.88
		2014	44.3	103	230	25.4	4.31	2.57	2.72	0.57	1.32	0.92

Amended Huntington Beach Energy Project
Appendix C, Table 4
Operational Results – Load Analysis
December 2015

110°F Ambient Temperature Scenarios

			NO_2 (µg/m³) [b]		CO (µg/m³)		SO_2 (µg/m³)				PM_{10} (µg/m³)	$PM_{2.5}$ (µg/m³)
Scenario Description [a]	Exhaust Scenario	Year	1-hour	1-hour (federal) [c]	1-hour	8-hour	1-hour	1-hour (federal)	3-hour	24-hour	24-hour	24-hour
		2010	62.1	121	324	52.4	4.93	4.25	4.02	1.23	3.26	1.47
GE 7FA.05 75% Load/		2011	56.7	107	294	46.8	4.45	3.84	3.50	0.74	1.99	1.38
GE LMS 100PB 100%	CC10/SC08/AB	2012	64.6	107	335	58.7	5.07	3.73	3.66	0.99	2.66	1.56
Load with Evap.		2013	51.9	104	271	54.2	4.13	3.87	3.85	0.91	2.45	1.50
		2014	63.8	106	331	55.6	5.01	4.17	3.97	1.15	3.10	1.42
		2010	62.1	121	324	52.4	4.93	4.25	4.02	1.23	3.26	1.47
GE 7FA.05 75% Load/		2011	56.7	107	294	46.8	4.45	3.84	3.50	0.74	1.99	1.38
GE LMS 100PB 100%	CC10/SC09/AB	2012	64.6	107	335	58.7	5.07	3.73	3.66	0.99	2.66	1.56
Load		2013	51.9	104	271	54.2	4.13	3.87	3.85	0.91	2.45	1.50
		2014	63.8	106	331	55.6	5.01	4.17	3.97	1.15	3.11	1.42
		2010	62.1	121	324	52.4	4.93	4.25	4.02	1.23	3.26	1.48
GE 7FA.05 75% Load/		2011	56.7	107	294	46.8	4.45	3.84	3.50	0.74	2.00	1.39
GE LMS 100PB 75%	CC10/SC10/AB	2012	64.6	107	335	58.7	5.07	3.73	3.66	0.99	2.67	1.56
Load		2013	51.9	104	271	54.2	4.13	3.87	3.85	0.91	2.45	1.50
		2014	63.8	106	331	55.6	5.01	4.17	3.96	1.15	3.11	1.43
		2010	62.1	121	324	52.4	4.93	4.25	4.02	1.23	3.26	1.49
GE 7FA.05 75% Load/		2011	56.7	107	294	46.8	4.45	3.84	3.50	0.74	2.01	1.40
GE LMS 100PB 50%	CC10/SC11/AB	2012	64.6	107	335	58.8	5.07	3.73	3.66	0.99	2.67	1.57
Load		2013	51.9	104	271	54.2	4.13	3.87	3.85	0.91	2.45	1.50
		2014	63.8	106	331	55.6	5.01	4.17	3.96	1.15	3.12	1.43
		2010	74.9	127	390	77.9	4.82	4.21	3.83	1.34	4.31	2.34
GE 7FA.05 48% Load/		2011	70.7	117	369	67.1	4.56	4.04	3.97	0.95	3.09	2.32
GE LMS 100PB 100%	CC11/SC08/AB	2012	73.0	116	381	81.2	4.72	4.12	4.27	1.23	3.93	2.48
Load with Evap.		2013	72.0	109	376	70.2	4.65	4.18	4.22	1.13	3.61	2.59
		2014	78.0	111	407	74.2	5.03	4.31	4.05	1.26	4.09	2.68
		2010	74.9	127	390	77.9	4.82	4.21	3.83	1.34	4.31	2.34
GE 7FA.05 48% Load/		2011	70.7	117	369	67.1	4.56	4.04	3.97	0.95	3.10	2.33
GE LMS 100PB 100%	CC11/SC09/AB	2012	73.0	116	381	81.2	4.72	4.12	4.27	1.23	3.93	2.48
Load		2013	72.0	109	376	70.2	4.65	4.17	4.22	1.13	3.61	2.59
		2014	78.0	111	407	74.2	5.03	4.31	4.05	1.26	4.09	2.69
		2010	74.9	127	390	77.9	4.82	4.21	3.83	1.34	4.31	2.34
GE 7FA.05 48% Load/		2011	70.7	117	369	67.1	4.56	4.04	3.97	0.95	3.10	2.33
GE LMS 100PB 75%	CC11/SC10/AB	2012	73.0	116	381	81.2	4.72	4.12	4.27	1.23	3.93	2.49
Load		2013	72.0	109	376	70.2	4.65	4.17	4.22	1.13	3.62	2.59
		2014	78.0	111	407	74.2	5.03	4.31	4.05	1.26	4.10	2.69
		2010	74.9	127	390	78.0	4.82	4.21	3.83	1.34	4.31	2.35
GE 7FA.05 48% Load/		2011	70.7	117	369	67.1	4.56	4.04	3.97	0.95	3.11	2.33
GE LMS 100PB 50%	CC11/SC11/AB	2012	73.0	116	381	81.3	4.72	4.12	4.27	1.23	3.94	2.49
Load		2013	72.0	109	376	70.2	4.65	4.17	4.22	1.13	3.62	2.59
		2014	78.1	111	407	74.2	5.03	4.31	4.04	1.26	4.11	2.69

[a] All modeled scenarios include two GE 7FA.05 turbines, two GE LMS 100PB turbines, and the auxiliary boiler.
[b] The maximum 1-hour and annual NO_2 concentrations include ambient NO_2 ratios of 0.80 (EPA, 2011) and 0.75 (EPA, 2005), respectively.
[c] The total predicted concentration for the federal 1-hour NO_2 standard is the high-8th-high modeled concentration paired with 98th percentile seasonal hour-of-day background concentrations for 2010 through 2012.

Amended Huntington Beach Energy Project
Appendix C, Table 5
Operational Results – SCAQMD Rule 2005
December 2015

GE 7FA.05 Unit 1

Year	1-hour Concentration (µg/m³) [a, b]	1-hour Federal Concentration (µg/m³) [a, c]	Annual Concentration (µg/m³) [a, d]
2010	38.9	40.0	0.17
2011	34.5	35.5	0.17
2012	38.9	41.0	0.19
2013	42.2	43.8	0.19
2014	43.1	39.4	0.19

GE 7FA.05 Unit 2

Year	1-hour Concentration (µg/m³) [a, b]	1-hour Federal Concentration (µg/m³) [a, c]	Annual Concentration (µg/m³) [a, d]
2010	60.3	52.0	0.23
2011	53.3	49.1	0.24
2012	52.7	51.2	0.27
2013	58.5	62.0	0.26
2014	55.0	53.6	0.27

GE LMS 100PB Unit 1

Year	1-hour Concentration (µg/m³) [a, b]	1-hour Federal Concentration (µg/m³) [a, c]	Annual Concentration (µg/m³) [a, d]
2010	2.94	2.96	0.014
2011	3.03	3.05	0.017
2012	3.09	3.11	0.017
2013	3.12	3.14	0.020
2014	2.60	2.61	0.019

GE LMS 100PB Unit 2

Year	1-hour Concentration (µg/m³) [a, b]	1-hour Federal Concentration (µg/m³) [a, c]	Annual Concentration (µg/m³) [a, d]
2010	2.95	2.97	0.014
2011	3.01	3.03	0.016
2012	3.12	3.14	0.017
2013	3.07	3.10	0.020
2014	2.88	2.91	0.019

Auxiliary Boiler

Year	1-hour Concentration (µg/m³) [a]	1-hour Federal Concentration (µg/m³) [a]	Annual Concentration (µg/m³) [a]
2010	2.73	2.73	0.23
2011	2.54	2.54	0.24
2012	2.67	2.67	0.24
2013	2.32	2.32	0.23
2014	2.38	2.38	0.23

[a] The maximum 1-hour and annual NO_2 concentrations include ambient NO_2 ratios of 0.80 (EPA, 2011) and 0.75 (EPA, 2005), respectively.
[b] The modeled impact for the 1-hour NO_2 CAAQS for the GE 7FA.05 and GE LMS 100PB units are based on exhaust scenarios CC03 and SC03, respectively.
[c] The modeled impact for the 1-hour NO_2 NAAQS for the GE 7FA.05 and GE LMS 100PB units are based on exhaust scenarios CC07 and SC07, respectively.
[d] The modeled impact for the Annual NO_2 AAQS for the GE 7FA.05 and GE LMS 100PB units are based on exhaust scenarios CC07 and SC06, respectively.

Amended Huntington Beach Energy Project
Appendix C, Table 6
Operational Results – Class II SIL and Increment
December 2015

	NO_2 (µg/m^3) [a]		CO (µg/m^3)		PM_{10} (µg/m^3)	
Year	1-hour [b]	Annual [c]	1-hour [b]	8-hour [b]	24-hour [d]	Annual [e]
2010	89.0	0.57	594	114	4.63	0.56
2011	85.2	0.57	569	107	3.69	0.56
2012	89.8	0.62	600	121	4.97	0.61
2013	88.5	0.63	591	105	3.89	0.63
2014	94.5	0.64	631	109	4.78	0.64

[a] The maximum 1-hour and annual NO_2 concentrations include ambient NO_2 ratios of 0.80 (EPA, 2011) and 0.75 (EPA, 2005), respectively.

[b] The modeled impact for the 1-hour NO_2, 1-hour CO, and 8-hour CO Class II SIL and Increment for the GE 7FA.05 and GE LMS 100PB units are based on exhaust scenarios CC03 and SC03, respectively.
[b] The modeled impact for the Annual NO_2 Class II SIL and Increment for the GE 7FA.05 and GE LMS 100PB units are based on exhaust scenarios CC07 and SC06, respectively.

[d] The 24-hour PM_{10} concentration is based on the GE LMS 100PB turbines operating in exhaust scenario SC07, one GE 7FA.05 turbine operating 24 hours per day in exhaust scenario CC07, and one GE 7FA.05 turbine operating 20 hours per day in exhaust scenario CC07 and 4 hours per day in exhaust scenario CC06.
[e] The modeled impact for the Annual PM_{10} Class II SIL and Increment for the GE 7FA.05 and GE LMS 100PB units are based on exhaust scenarios CC07 and SC07, respectively.

Amended Huntington Beach Energy Project

Appendix C, Table 7 [a, b]

Competing Source Stack Parameters

December 2015

Point Sources

Facility	Source ID	Easting (X) (m)	Northing (Y) (m)	Base Elevation (m)	Stack Height (m)	Temperature (K)	Exit Velocity (m/s)	Stack Diameter (m)
HBEP	7FA01	409449	3723146	3.66	45.7	350	11.8	6.10
	7FA02	409474	3723182	3.66	45.7	350	11.8	6.10
	LMS01	409149	3723193	3.66	24.4	748	23.6	4.11
	LMS02	409185	3723168	3.66	24.4	748	23.6	4.11
	AUXBOILER	409438	3723236	3.66	24.4	432	21.2	0.91
Huntington Beach Generating Station (HBGS)	BOILER12	409274	3723095	3.66	61.0	367	7.90	6.27
Orange County Sanitation - Fountain Valley (OCSFV)	1730101	412962	3728359	8.00	7.41	1,089	1.37	2.23
	1730102	412914	3728328	7.70	7.62	475	7.03	0.55
	1730103	412935	3728401	8.00	18.9	533	17.9	0.76
	1730104	412942	3728391	8.00	18.9	533	17.9	0.76
	1730105	412939	3728396	8.00	18.9	533	17.9	0.76
Orange County Sanitation - Huntington Beach (OCSHB)	2911001	411071	3722313	1.60	7.62	475	7.44	0.53
	2911002	411096	3722214	1.60	7.41	1089	1.37	0.68
	2911003	411240	3722455	1.60	18.0	589	22.9	0.76
	2911004	411248	3722455	1.60	18.0	589	22.9	0.76
	2911005	411255	3722455	1.60	18.0	589	22.9	0.76
	2911006	411263	3722455	1.60	18.0	589	22.9	0.76
	2911007	411270	3722455	1.60	18.0	589	22.9	0.76
Beta Offshore (Beta)	16607301	395222	3716431	0	18.3	661	31.1	0.30
	16607302	395222	3716431	0	18.3	641	30.0	0.30
	16607303	395222	3716431	0	18.3	585	24.2	0.30
	16607304	394082	3717932	0	18.3	663	28.7	0.30
	16607305	394082	3717932	0	18.3	684	34.7	0.30
	16607306	394082	3717932	0	18.3	583	21.1	0.30
	16607307	395265	3716554	0	18.3	671	39.4	0.61
	16607308	395265	3716554	0	18.3	671	38.1	0.61
	16607309	395265	3716554	0	18.3	677	37.5	0.61
	16607310	395265	3716554	0	18.3	671	81.2	0.76
	16607311	395265	3716554	0	18.3	669	81.1	0.76
	16607312	395265	3716554	0	18.3	668	81.4	0.76
	16607313	395265	3716554	0	22.9	464	8.35	0.51

Volume Sources

Facility	Source ID	Base Elevation (m)	Release Height (m)	Initial Horizontal Dimension (m)	Initial Vertical Dimension (m)
Shipping Lanes (525 sources)	734601-774425	0	0.0	186	23.3

[a] Competing source data provided by SCAQMD.

[b] This table contains the same information presented in Appendix 5.1C, Table 5.1C.12 of the HBEP PTA.

Amended Huntington Beach Energy Project

Appendix C, Table 8 [a, b]

Competing Source Emission Rates

December 2015

Emission Rates for PSD 1-hour NO_2 Competing Source Modeling

Facility	Source ID	1-hour NO_2 (g/s)	1-hour NO_2 (lb/hr)
HBEP	7FA01	7.18	57.0
	7FA02	7.18	57.0
	LMS01	2.67	21.2
	LMS02	2.67	21.2
	AUXBOILER	0.054	0.42
HBGS	BOILER12	4.32	34.3
OCSFV	1730101	0.65	5.17
	1730102	0.01	0.08
	1730103	0.98	7.78
	1730104	0.98	7.78
	1730105	0.98	7.78
OCSHB	2911001	0.08	0.60
	2911002	0.11	0.87
	2911003	0.87	6.90
	2911004	0.87	6.90
	2911005	0.87	6.90
	2911006	0.87	6.90
	2911007	0.87	6.90
Beta	16607301	1.90	15.1
	16607302	1.90	15.1
	16607303	1.90	15.1
	16607304	1.90	15.1
	16607305	1.90	15.1
	16607306	1.90	15.1
	16607307	0.37	2.94
	16607308	0.31	2.46
	16607309	0.35	2.78
	16607310	2.52	20.0
	16607311	2.48	19.7
	16607312	2.48	19.7
	16607313	10.3	81.6
Shipping Lanes (Total for 525 sources)	734601-774425	25.5	202

[a] Competing source data provided by SCAQMD.

[b] This table contains the same information presented in Appendix 5.1C, Table 5.1C.13 of the HBEP PTA, with the exception of the auxiliary boiler 1-hour NO_2 emission rate.

Amended Huntington Beach Energy Project
Appendix C, Table 9
Competing Source Results
December 2015

1-hour NO_2 Concentrations ($\mu g/m^3$) [a, b]

Year	2010	2011	2012	2013	2014
All	140	147	148	143	144
HBEP	75.4	71.0	73.2	74.1	76.0
HBGS	5.15	5.08	5.32	5.12	4.73
OCSFV	8.92	8.92	8.87	8.91	9.02
OCSHB	56.2	54.0	54.1	54.1	53.7
BETA	58.2	63.2	62.6	66.8	66.1
SHIPS	24.3	23.4	23.9	22.6	23.3

[a] The total predicted concentration for the federal 1-hour NO_2 standard is the high-8th-high modeled concentration paired with 98th percentile seasonal hour-of-day background concentrations for 2010 through 2012.

[b] The modeled impact for the 1-hour NO_2 competing source assessment for the GE 7FA.05 and GE LMS 100PB units are based on exhaust scenarios CC03 and SC03, respectively.

Amended Huntington Beach Energy Project
Appendix C, Table 10
Operational Results – Class I SIL and Increment
December 2015

Annual NO_2 Concentrations ($\mu g/m^3$) at 50 km Receptor Ring [a, b]

Year	2010	2011	2012	2013	2014
All	0.0054	0.0054	0.0055	0.0051	0.0047
GE 7FA.05 Unit 1	0.0021	0.0022	0.0022	0.0020	0.0019
GE 7FA.05 Unit 2	0.0021	0.0022	0.0022	0.0021	0.0019
GE LMS 100PB Unit 1	0.0005	0.0005	0.0005	0.0005	0.0004
GE LMS 100PB Unit 2	0.0005	0.0005	0.0005	0.0005	0.0004
Auxiliary Boiler	0.0001	0.0001	0.0001	0.0001	0.0001

24-hour PM_{10} Concentrations ($\mu g/m^3$) at 50 km Receptor Ring [c]

Year	2010	2011	2012	2013	2014
All	0.038	0.039	0.042	0.036	0.038
GE 7FA.05 Unit 1	0.012	0.012	0.013	0.011	0.012
GE 7FA.05 Unit 2	0.012	0.012	0.013	0.011	0.012
GE LMS 100PB Unit 1	0.0080	0.0074	0.008	0.0070	0.0075
GE LMS 100PB Unit 2	0.0080	0.0074	0.008	0.0071	0.0075
Auxiliary Boiler	0.0005	0.0007	0.0004	0.0006	0.0006

Annual PM_{10} Concentrations ($\mu g/m^3$) at 50 km Receptor Ring [c]

Year	2010	2011	2012	2013	2014
All	0.0055	0.0056	0.0057	0.0053	0.0049
GE 7FA.05 Unit 1	0.0023	0.0023	0.0023	0.0022	0.0020
GE 7FA.05 Unit 2	0.0023	0.0023	0.0023	0.0022	0.0020
GE LMS 100PB Unit 1	0.0005	0.0005	0.0005	0.0004	0.0004
GE LMS 100PB Unit 2	0.0005	0.0005	0.0005	0.0004	0.0004
Auxiliary Boiler	8.0E-05	8.0E-05	8.0E-05	8.0E-05	7.0E-05

[a] The maximum annual NO_2 concentrations include an ambient NO_2 ratio of 0.75 (EPA, 2005).

[b] The modeled impact for the Annual NO_2 Class I SIL and Increment for the GE 7FA.05 and GE LMS 100PB units are based on exhaust scenarios CC07 and SC06, respectively.

[c] The modeled impact for the 24-hour and annual PM_{10} Class I SIL and Increment for the GE 7FA.05 and GE LMS 100PB units are based on exhaust scenarios CC07 and SC07, respectively.

Appendix D
Air Quality Impact Analysis—Joint Frequency Distributions for VISCREEN

Amended Huntington Beach Energy Project
Appendix D, Table 1
Joint Frequency Distribution for Crystal Cove State Park
December 2015

Stability Class	Wind Speed (m/s)	Transport Time (hours)	σ_y (meters)	σ_z (meters)	μ (m/s)	$\sigma_y \times \sigma_z \times \mu$ (m^3/s)	Count	Frequency*	Cumulative Frequency*
F	1	3.47	330.4	50.9	0.5	8,406	120	0.3	0.3
E	1	3.47	496.3	87.8	0.5	21,776	67	0.2	0.4
F	2	1.74	330.4	50.9	1.5	25,219	54	0.1	0.5
F	3	1.16	330.4	50.9	2.5	42,032	5	0.0	0.6
D	1	3.47	662.9	153.0	0.5	50,726	45	0.1	0.7
E	2	1.74	496.3	87.8	1.5	65,327	41	0.1	0.8
E	3	1.16	496.3	87.8	2.5	108,878	21	0.0	0.8
D	2	1.74	662.9	153.0	1.5	152,178	59	0.1	0.9
E	4	0.87	496.3	87.8	3.5	152,429	0	0.0	0.9
D	3	1.16	662.9	153.0	2.5	253,630	12	0.0	1.0
D	4	0.87	662.9	153.0	3.5	355,082	19	0.0	1.0
D	5	0.69	662.9	153.0	4.5	456,534	8	0.0	1.0
D	6	0.58	662.9	153.0	5.5	557,986	1	0.0	1.0
D	7	0.50	662.9	153.0	6.5	659,438	0	0.0	1.0
D	8	0.43	662.9	153.0	7.5	760,890	0	0.0	1.0

* Frequency and cumulative frequency based on all hours of the day.

Notes:
m/s = meter(s) per second
m^3/s = cubic meters per second
σ_y = Pasquill-Gifford horizontal diffusion coefficient
σ_z = Pasquill-Gifford vertical diffusion coefficient
μ = wind speed (based off of wind speed Bin average)

Amended Huntington Beach Energy Project
Appendix D, Table 2
Joint Frequency Distribution for Huntington Beach State Park
December 2015

Stability Class	Wind Speed (m/s)	Transport Time (hours)	σ_y (meters)	σ_z (meters)	μ (m/s)	$\sigma_y \times \sigma_z \times \mu$ (m^3/s)	Count	Frequency	Cumulative Frequency
F	1	0.017	2.64	1.59	0.5	2.10	1,702	3.9	3.9
E	1	0.017	3.98	2.39	0.5	4.76	675	1.5	5.4
F	2	0.009	2.64	1.59	1.5	6.31	955	2.2	7.6
D	1	0.017	5.33	3.10	0.5	8.27	370	0.8	8.4
F	3	0.006	2.64	1.59	2.5	10.51	195	0.4	8.9
E	2	0.009	3.98	2.39	1.5	14.28	635	1.4	10.3
E	3	0.006	3.98	2.39	2.5	23.81	158	0.4	10.7
D	2	0.009	5.33	3.10	1.5	24.80	527	1.2	11.9
E	4	0.004	3.98	2.39	3.5	33.33	63	0.1	12.0
D	3	0.006	5.33	3.10	2.5	41.33	264	0.6	12.7
D	4	0.004	5.33	3.10	3.5	57.87	66	0.2	12.8
D	5	0.003	5.33	3.10	4.5	74.40	53	0.1	12.9
D	6	0.003	5.33	3.10	5.5	90.93	96	0.2	13.1
D	7	0.002	5.33	3.10	6.5	107.47	64	0.1	13.3
D	8	0.002	5.33	3.10	7.5	124.00	46	0.1	13.4

Appendix E
Air Quality Impact Analysis—Fumigation

Amended Huntington Beach Energy Project
Appendix E, Table 1
Inversion Break-up and Shoreline Fumigation Analyses
December 2015

AERSCREEN Inversion Break-Up Fumigation Impact Analysis Results

Pollutant	Averaging Period	Fumigation Impacts [a] ($\mu g/m^3$)	Background ($\mu g/m^3$)	Total ($\mu g/m^3$)	CAAQS ($\mu g/m^3$)	Above CAAQS?	NAAQS ($\mu g/m^3$)	Above NAAQS?
PM_{10}	24-hour	10.6	51.0	61.6	N/A	no	150	no
NO_2 [b]	1-hour	85.3	142	227	339	no	N/A	no
SO_2	1-hour	5.45	20.2	25.7	655	no	N/A	no
	3-hour	5.32	20.2	25.5	N/A	no	1,300	no
	24-hour	5.21	5.20	10.41	105	no	N/A	no
CO	1-hour	529	3,321	3,850	23,000	no	40,000	no
	8-hour	147	2,519	2,666	10,000	no	10,000	no

Notes:
[a] Fumigation impacts were calculated by multiplying the 1 g/s unit emission AERSCREEN impacts by source emissions. The sum of all emission sources are displayed.
[b] 1-hour NO_2 impact assumes an 80 percent ambient ratio method.

AERSCREEN Shoreline Fumigation Impact Analysis Results

Pollutant	Averaging Period	Fumigation Impacts [a] ($\mu g/m^3$)	Background ($\mu g/m^3$)	Total ($\mu g/m^3$)	CAAQS ($\mu g/m^3$)	Above CAAQS?	NAAQS ($\mu g/m^3$)	Above NAAQS?
PM_{10}	24-hour	10.5	51.0	61.5	N/A	no	150	no
NO_2 [b]	1-hour	47.2	142	189	339	no	N/A	no
SO_2	1-hour	3.52	20.2	23.7	655	no	N/A	no
	3-hour	3.55	20.2	23.8	N/A	no	1,300	no
	24-hour	2.13	5.20	7.33	105	no	N/A	no
CO	1-hour	125	3,321	3,446	23,000	no	40,000	no
	8-hour	37.6	2,519	2,557	10,000	no	10,000	no

Notes:
[a] Fumigation impacts were calculated by multiplying the 1 g/s unit emission AERSCREEN impacts by source emissions. The sum of all emission sources are displayed.
[b] 1-hour NO_2 impact assumes an 80 percent ambient ratio method.

Amended Huntington Beach Energy Project
Appendix E, Table 1
Inversion Break-up and Shoreline Fumigation Analyses
December 2015

AERSCREEN Inputs for Shoreline Fumigation Impact Analysis for Unit Emissions

Emission Source	Scenario	Emission Rate (g/s)	Stack Height (m)	Stack Inside Diameter (m)	Stack Exit Velocity (m/s)	Stack Gas Exit Temperature (K)	Distance to Shore (m)
GE LMS 100PB Simple-cycle 1	1	1	24.4	4.11	33.3	694	350
GE LMS 100PB Simple-cycle 2	1	1	24.4	4.11	33.3	694	350
GE LMS 100PB Simple-cycle 1	3	1	24.4	4.11	23.8	748	350
GE LMS 100PB Simple-cycle 2	3	1	24.4	4.11	23.8	748	350
GE LMS 100PB Simple-cycle 1	4	1	24.4	4.11	33.1	697	350
GE LMS 100PB Simple-cycle 2	4	1	24.4	4.11	33.1	697	350
GE LMS 100PB Simple-cycle 1	7	1	24.4	4.11	23.6	748	350
GE LMS 100PB Simple-cycle 2	7	1	24.4	4.11	23.6	748	350
GE 7FA.05 Combined-cycle 1	3	1	45.7	6.10	12.2	350	500
GE 7FA.05 Combined-cycle 2	3	1	45.7	6.10	12.2	350	550
GE 7FA.05 Combined-cycle 1	7	1	45.7	6.10	11.8	350	500
GE 7FA.05 Combined-cycle 2	7	1	45.7	6.10	11.8	350	550
Auxiliary Boiler	N/A	1	24.4	0.91	21.2	432	575

Notes:
AERSCREEN was run with a Rural option, minimum temperature of 275.1 K and maximum temperature of 315.1 K (based on AERMET data), minimum wind speed of 0.5 m/s, and 100 m anemometer height. Surface profile of water and climate profile of average.

AERSCREEN Outputs for Shoreline Fumigation Impact Analysis for Unit Emissions

Emission Source	Scenario	Inversion Break-Up Fumigation Impacts (µg/m^3)				Shoreline Fumigation Impacts (µg/m^3)			
		1-hour	3-hour	8-hour	24-hour	1-hour	3-hour	8-hour	24-hour
GE LMS 100PB Simple-cycle 1	1	1.96	1.96	1.76	1.17	8.60	8.60	7.74	5.16
GE LMS 100PB Simple-cycle 2	1	1.96	1.96	1.76	1.17	8.60	8.60	7.74	5.16
GE LMS 100PB Simple-cycle 1	3	2.47	2.47	2.23	1.48	11.1	11.1	9.95	6.63
GE LMS 100PB Simple-cycle 2	3	2.47	2.47	2.23	1.48	11.1	11.1	9.95	6.63
GE LMS 100PB Simple-cycle 1	4	1.96	1.96	1.77	1.18	8.62	8.62	7.76	5.17
GE LMS 100PB Simple-cycle 2	4	1.96	1.96	1.77	1.18	8.62	8.62	7.76	5.17
GE LMS 100PB Simple-cycle 1	7	2.49	2.49	2.24	1.49	11.1	11.1	10.0	6.68
GE LMS 100PB Simple-cycle 2	7	2.49	2.49	2.24	1.49	11.1	11.1	10.0	6.68
GE 7FA.05 Combined-cycle 1	3	5.95	5.95	5.35	3.57				
GE 7FA.05 Combined-cycle 2	3	5.95	5.95	5.35	3.57				
GE 7FA.05 Combined-cycle 1	7	6.08	6.08	5.47	3.65				
GE 7FA.05 Combined-cycle 2	7	6.08	6.08	5.47	3.65				
Auxiliary Boiler	N/A	38.1	38.1	34.3	22.8				

Notes:
GE 7FA.05 Combined-cycle 1, GE 7FA.05 Combined-cycle 2, and Auxiliary Boiler are all located > 500 m from the shore. As a result, AERSCREEN was not able to calculate impacts.

Amended Huntington Beach Energy Project
Appendix E, Table 1
Inversion Break-up and Shoreline Fumigation Analyses
December 2015

Criteria Pollutant Emissions

Pollutant	Averaging Period	GE LMS 100PB Simple-cycle 1	GE LMS 100PB Simple-cycle 2	GE 7FA.05 Combined-cycle 1	GE 7FA.05 Combined-cycle 2	Auxiliary Boiler
PM_{10}	24-hour	0.79	0.79	1.07	1.07	0.020
NO_2	1-hour	2.67	2.67	7.69	7.69	0.054
SO_2	1-hour	0.20	0.20	0.37	0.37	0.0061
	3-hour	0.21	0.21	0.35	0.35	0.0061
	24-hour	0.21	0.21	0.35	0.35	0.0031
CO	1-hour	5.66	5.66	41.0	41.0	0.36
	8-hour	1.89	1.89	12.0	12.0	0.30

Appendix F
Air Quality Impact Analysis—Overlap Scenarios

Amended Huntington Beach Energy Project
Appendix F, Table 1
Combined-cycle Power Block Operation with Simple-cycle Power Block Construction Stack Parameters
December 2015

Construction Area Poly Sources

Source ID	Base Elevation (m)	Release Height (m)	Number of Vertices	Vertical Dimension (m)	Easting (X1) (m)	Northing (Y1) (m)	Easting (X2) (m)	Northing (Y2) (m)	Easting (X3) (m)	Northing (Y3) (m)	Easting (X4) (m)	Northing (Y4) (m)
FUG	3.66	0.00	4	1.00	409175	3723285	409277	3723213	409206	3723111	409103	3723183

Construction Point Sources

Source ID	Stack Release Type (Beta)	Easting (X) (m)	Northing (Y) (m)	Base Elevation (m)	Stack Height (m)	Temperature (K)	Exit Velocity (m/s)	Stack Diameter (m)
WEST01	Horizontal	409175	3723285	3.66	4.60	533	18.0	0.127
WEST02	Horizontal	409195	3723271	3.66	4.60	533	18.0	0.127
WEST03	Horizontal	409216	3723256	3.66	4.60	533	18.0	0.127
WEST04	Horizontal	409236	3723242	3.66	4.60	533	18.0	0.127
WEST05	Horizontal	409257	3723228	3.66	4.60	533	18.0	0.127
WEST06	Horizontal	409277	3723213	3.66	4.60	533	18.0	0.127
WEST07	Horizontal	409161	3723265	3.66	4.60	533	18.0	0.127
WEST08	Horizontal	409181	3723250	3.66	4.60	533	18.0	0.127
WEST09	Horizontal	409202	3723236	3.66	4.60	533	18.0	0.127
WEST10	Horizontal	409222	3723222	3.66	4.60	533	18.0	0.127
WEST11	Horizontal	409243	3723207	3.66	4.60	533	18.0	0.127
WEST12	Horizontal	409263	3723193	3.66	4.60	533	18.0	0.127
WEST13	Horizontal	409146	3723244	3.66	4.60	533	18.0	0.127
WEST14	Horizontal	409167	3723230	3.66	4.60	533	18.0	0.127
WEST15	Horizontal	409187	3723215	3.66	4.60	533	18.0	0.127
WEST16	Horizontal	409208	3723201	3.66	4.60	533	18.0	0.127
WEST17	Horizontal	409228	3723187	3.66	4.60	533	18.0	0.127
WEST18	Horizontal	409249	3723172	3.66	4.60	533	18.0	0.127
WEST19	Horizontal	409132	3723224	3.66	4.60	533	18.0	0.127
WEST20	Horizontal	409152	3723209	3.66	4.60	533	18.0	0.127
WEST21	Horizontal	409173	3723195	3.66	4.60	533	18.0	0.127
WEST22	Horizontal	409193	3723181	3.66	4.60	533	18.0	0.127
WEST23	Horizontal	409214	3723166	3.66	4.60	533	18.0	0.127
WEST24	Horizontal	409234	3723152	3.66	4.60	533	18.0	0.127
WEST25	Horizontal	409118	3723203	3.66	4.60	533	18.0	0.127
WEST26	Horizontal	409138	3723189	3.66	4.60	533	18.0	0.127
WEST27	Horizontal	409159	3723174	3.66	4.60	533	18.0	0.127
WEST28	Horizontal	409179	3723160	3.66	4.60	533	18.0	0.127
WEST29	Horizontal	409200	3723146	3.66	4.60	533	18.0	0.127
WEST30	Horizontal	409220	3723131	3.66	4.60	533	18.0	0.127
WEST31	Horizontal	409103	3723183	3.66	4.60	533	18.0	0.127
WEST32	Horizontal	409124	3723168	3.66	4.60	533	18.0	0.127
WEST33	Horizontal	409144	3723154	3.66	4.60	533	18.0	0.127
WEST34	Horizontal	409165	3723140	3.66	4.60	533	18.0	0.127
WEST35	Horizontal	409185	3723125	3.66	4.60	533	18.0	0.127
WEST36	Horizontal	409206	3723111	3.66	4.60	533	18.0	0.127

Amended Huntington Beach Energy Project

Appendix F, Table 1

Combined-cycle Power Block Operation with Simple-cycle Power Block Construction Stack Parameters

December 2015

Operational Point Sources

Pollutant Scenario	Source ID	Turbine Load	Easting (X) (m)	Northing (Y) (m)	Base Elevation (m)	Stack Height (m)	Temperature (K)	Exit Velocity (m/s)	Stack Diameter (m)
CO, 1-hour NO_2, 1-hour SO_2	GE 7FA.05-01 Scenario 3	max	409449	3723146	3.66	45.7	350	12.2	6.10
	GE 7FA.05-02 Scenario 3		409474	3723182	3.66	45.7	350	12.2	6.10
1-hour NO_2 (federal), Annual NO_2, 3-hour SO_2, 24-hour SO_2, PM_{10}, $PM_{2.5}$	GE 7FA.05-01 Scenario 7	min	409449	3723146	3.66	45.7	350	11.8	6.10
	GE 7FA.05-02 Scenario 7		409474	3723182	3.66	45.7	350	11.8	6.10
All Pollutants	Auxiliary Boiler	100%	409438	3723236	3.66	24.4	432	21.2	0.91

This table contains the same information presented in Appendix 5.1C, Table 5.1C.19 of the HBEP PTA.

Amended Huntington Beach Energy Project

Appendix F, Table 2 [a]

Combined-cycle Power Block Operation with Simple-cycle Power Block Construction Emission Rates

December 2015

Emission Rates for 1-hour, 3-hour, 8-hour, and 24-hour Modeling

	1-hour NO_2		1-hour NO_2 (federal)		1-hour CO		8-hour CO		1-hour SO_2		3-hour SO_2		24-hour SO_2		24-hour PM_{10}		24-hour $PM_{2.5}$	
Source ID	(g/s)	(lb/hr)	(g/s)	(lb/hr)	(g/s)	(lb/hr)	(g/s)	(lb/hr)	(g/s)	(lb/hr)	(g/s)	(lb/hr)	(g/s)	(lb/hr)	(g/s)	(lb/hr)	(g/s)	(lb/hr)
FUG	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.018	0.14	0.0075	0.060
EXH [b]	0.057	0.45	0.057	0.45	0.58	4.57	0.58	4.57	0.0011	0.0086	0.0011	0.0086	4.5E-04	0.0036	7.2E-04	0.0058	7.2E-04	0.0057
GE 7FA.05-01	7.69	61.0	7.18	57.0	41.0	325	12.0	95.2	0.37	2.95	0.35	2.79	0.35	2.79	1.07	8.50	1.07	8.50
GE 7FA.05-02	7.69	61.0	7.18	57.0	41.0	325	12.0	95.2	0.37	2.95	0.35	2.79	0.35	2.79	1.07	8.50	1.07	8.50
Auxiliary Boiler	0.054	0.42	0.054	0.42	0.36	2.83	0.30	2.37	0.0061	0.048	0.0061	0.048	0.0031	0.025	0.020	0.160	0.020	0.160
Maximum Month	79		79		79		79		79		79		79		79		79	

Emission Rates for Annual Modeling

	Annual NO_2		Annual PM_{10}		Annual $PM_{2.5}$	
Source ID	(g/s)	(lb/hr)	(g/s)	(lb/hr)	(g/s)	(lb/hr)
FUG	-	-	0.0065	0.052	0.0017	0.014
EXH [b]	0.011	0.091	3.5E-04	0.0027	3.4E-04	0.0027
GE 7FA.05-01	1.02	8.12	0.81	6.42	0.81	6.42
GE 7FA.05-02	1.02	8.12	0.81	6.42	0.81	6.42
Auxiliary Boiler	0.030	0.23	0.019	0.150	0.019	0.150
Maximum Months	78-89		78-89		78-89	

[a] This table contains the same information presented in Appendix 5.1C, Table 5.1C.20 of the HBEP PTA, with the exception of the GE 7FA.05 PM_{10}/$PM_{2.5}$ emission rates and all auxiliary boiler emission rates.

[b] Emission rates for exhaust sources are the total for all sources.

Amended Huntington Beach Energy Project
Appendix F, Table 3
Combined-cycle Power Block Operation with Simple-cycle Power Block Construction Building Parameters
December 2015

Building Name	Number of Tiers	Tier Number	Base Elevation (m)	Tier Height (m)	Number of Corners	Corner 1 East (X) (m)	Corner 1 North (Y) (m)	Corner 2 East (X) (m)	Corner 2 North (Y) (m)	Corner 3 East (X) (m)	Corner 3 North (Y) (m)	Corner 4 East (X) (m)	Corner 4 North (Y) (m)	Corner 5 East (X) (m)	Corner 5 North (Y) (m)	Corner 6 East (X) (m)	Corner 6 North (Y) (m)	Corner 7 East (X) (m)	Corner 7 North (Y) (m)	Corner 8 East (X) (m)	Corner 8 North (Y) (m)	Corner 9 East (X) (m)	Corner 9 North (Y) (m)
'AIRIN3'	1	-	3.66	21.6	9	409385	3723198	409377	3723187	409384	3723182	409387	3723182	409395	3723177	409401	3723185	409393	3723191	409391	3723194	409385	3723198
'AIRIN4'	1	-	3.66	21.6	9	409426	3723221	409421	3723213	409412	3723218	409409	3723219	409402	3723223	409410	3723234	409416	3723230	409418	3723227	409426	3723221
'HRSG1'	1	-	3.66	25.6	5	409424	3723169	409447	3723152	409443	3723145	409418	3723162	409424	3723169								
'HRSG2'	1	-	3.66	25.6	5	409449	3723205	409473	3723188	409468	3723182	409444	3723198	409449	3723205								
'ACC'	1	-	3.66	33.5	5	409549	3723302	409551	3723173	409512	3723173	409510	3723301	409549	3723302								
'STG'	1	-	3.66	17.9	5	409482	3723251	409490	3723251	409490	3723235	409482	3723235	409482	3723251								
'WALL1'	1	-	3.66	15.2	9	409566	3723274	409567	3723158	409519	3723157	409437	3723109	409436	3723110	409519	3723158	409566	3723159	409565	3723274	409566	3723274
'WALL2'	1	-	3.66	6.10	7	409447	3723302	409427	3723301	409402	3723266	409402	3723265	409427	3723301	409447	3723301	409447	3723301				
'UNIT1L1'	2	1	3.66	23.2	4	409293	3723102	409312	3723128	409335	3723112	409317	3723086										
'UNIT1L2'	-	2	3.66	37.6	4	409301	3723114	409312	3723128	409335	3723112	409326	3723098										
'UNIT2L1'	2	1	3.66	23.2	4	409252	3723127	409272	3723153	409295	3723137	409277	3723111										
'UNIT2L2'	-	2	3.66	37.6	4	409261	3723139	409272	3723153	409295	3723137	409285	3723123										

Cylindical Building Name	Base Elevation (m)	Center East (X) (m)	Center North (Y) (m)	Tank Height (m)	Tank Diameter (m)
Stack12	3.66	409274	3723095	61.0	6.27

This table contains the same information presented in Appendix 5.1C, Table 5.1C.21 of the HBEP PTA.

Amended Huntington Beach Energy Project
Appendix F, Table 4
Combined-cycle Power Block Operation with Simple-cycle Power Block Construction Results
December 2015

		NO_2 (µg/m^3)			CO (µg/m^3)		SO_2 (µg/m^3)				PM_{10} (µg/m^3)		$PM_{2.5}$ (µg/m^3)	
Source	Year	1-hour [a]	1-hour (federal) [b]	Annual [a]	1-hour	8-hour	1-hour	1-hour (federal)	3-hour	24-hour	24-hour	Annual	24-hour	Annual
ALL	2010	89.0	137	0.65	594	114	5.41	4.81	4.36	1.52	7.79	0.83	2.85	0.57
Exhaust		7.66	7.52	0.36	95.8	81.2	0.18	0.18	0.17	0.036	0.058	0.014	0.051	0.014
Fugitive		-	-	-	-	-	-	-	-	-	7.72	0.79	2.52	0.21
Operation		89.0	75.4	0.56	594	113	5.41	4.81	4.36	1.52	4.73	0.55	2.74	0.55
ALL	2011	85.2	124	0.64	570	107	5.20	4.66	4.53	1.22	9.11	0.85	3.02	0.57
Exhaust		7.68	7.54	0.36	96.0	80.1	0.18	0.18	0.17	0.035	0.056	0.014	0.050	0.014
Fugitive		-	-	-	-	-	-	-	-	-	9.04	0.80	2.97	0.21
Operation		85.2	71.0	0.55	569	107	5.20	4.66	4.53	1.22	3.84	0.55	2.72	0.55
ALL	2012	89.7	130	0.69	600	122	5.47	4.84	5.01	1.66	9.33	0.88	3.10	0.62
Exhaust		7.76	7.56	0.37	97.0	75.6	0.18	0.18	0.17	0.035	0.057	0.015	0.051	0.015
Fugitive		-	-	-	-	-	-	-	-	-	9.29	0.83	2.86	0.22
Operation		89.6	73.2	0.60	599	121	5.47	4.84	5.01	1.66	5.09	0.60	2.95	0.60
ALL	2013	88.3	117	0.69	591	105	5.39	4.92	4.75	1.28	8.61	0.87	3.39	0.63
Exhaust		7.76	7.53	0.36	97.0	79.0	0.18	0.18	0.17	0.035	0.057	0.014	0.050	0.014
Fugitive		-	-	-	-	-	-	-	-	-	8.25	0.82	2.67	0.22
Operation		88.3	74.1	0.61	590	105	5.39	4.92	4.75	1.28	3.98	0.61	3.29	0.61
ALL	2014	94.3	123	0.70	631	110	5.75	5.06	4.68	1.55	8.53	0.84	3.38	0.64
Exhaust		7.74	7.63	0.34	96.8	77.9	0.18	0.18	0.17	0.035	0.057	0.014	0.049	0.014
Fugitive		-	-	-	-	-	-	-	-	-	8.43	0.77	2.81	0.20
Operation		94.3	76.0	0.62	630	109	5.75	5.06	4.68	1.55	4.86	0.62	3.36	0.62

[a] The maximum 1-hour and annual NO_2 concentrations include ambient NO_2 ratios of 0.80 (EPA, 2011) and 0.75 (EPA, 2005), respectively.
[b] The total predicted concentration for the federal 1-hour NO_2 standard is the high-8th-high modeled concentration paired with 98th percentile seasonal hour-of-day background concentrations for 2010 through 2012.

Amended Huntington Beach Energy Project
Appendix F, Table 5
Amended HBEP Operation with Units 1 and 2 Demolition Stack Parameters
December 2015

Construction Area Poly Sources

Source ID	Base Elevation (m)	Release Height (m)	Number of Vertices	Vertical Dimension (m)	Easting (X1) (m)	Northing (Y1) (m)	Easting (X2) (m)	Northing (Y2) (m)	Easting (X3) (m)	Northing (Y3) (m)	Easting (X4) (m)	Northing (Y4) (m)
FUG	3.66	0.00	4	1.00	409294	3723203	409376	3723146	409304	3723043	409222	3723101

Construction Point Sources

Source ID	Stack Release Type (Beta)	Easting (X) (m)	Northing (Y) (m)	Base Elevation (m)	Stack Height (m)	Temperature (K)	Exit Velocity (m/s)	Stack Diameter (m)
SOUTH01	Horizontal	409294	3723203	3.66	4.60	533	18.0	0.127
SOUTH02	Horizontal	409314	3723189	3.66	4.60	533	18.0	0.127
SOUTH03	Horizontal	409335	3723174	3.66	4.60	533	18.0	0.127
SOUTH04	Horizontal	409355	3723160	3.66	4.60	533	18.0	0.127
SOUTH05	Horizontal	409376	3723146	3.66	4.60	533	18.0	0.127
SOUTH06	Horizontal	409280	3723183	3.66	4.60	533	18.0	0.127
SOUTH07	Horizontal	409300	3723168	3.66	4.60	533	18.0	0.127
SOUTH08	Horizontal	409321	3723154	3.66	4.60	533	18.0	0.127
SOUTH09	Horizontal	409341	3723140	3.66	4.60	533	18.0	0.127
SOUTH10	Horizontal	409362	3723125	3.66	4.60	533	18.0	0.127
SOUTH11	Horizontal	409265	3723162	3.66	4.60	533	18.0	0.127
SOUTH12	Horizontal	409286	3723148	3.66	4.60	533	18.0	0.127
SOUTH13	Horizontal	409306	3723133	3.66	4.60	533	18.0	0.127
SOUTH14	Horizontal	409327	3723119	3.66	4.60	533	18.0	0.127
SOUTH15	Horizontal	409347	3723105	3.66	4.60	533	18.0	0.127
SOUTH16	Horizontal	409251	3723142	3.66	4.60	533	18.0	0.127
SOUTH17	Horizontal	409271	3723127	3.66	4.60	533	18.0	0.127
SOUTH18	Horizontal	409292	3723113	3.66	4.60	533	18.0	0.127
SOUTH19	Horizontal	409312	3723099	3.66	4.60	533	18.0	0.127
SOUTH20	Horizontal	409333	3723084	3.66	4.60	533	18.0	0.127
SOUTH21	Horizontal	409237	3723121	3.66	4.60	533	18.0	0.127
SOUTH22	Horizontal	409257	3723107	3.66	4.60	533	18.0	0.127
SOUTH23	Horizontal	409278	3723092	3.66	4.60	533	18.0	0.127
SOUTH24	Horizontal	409298	3723078	3.66	4.60	533	18.0	0.127
SOUTH25	Horizontal	409319	3723064	3.66	4.60	533	18.0	0.127
SOUTH26	Horizontal	409222	3723101	3.66	4.60	533	18.0	0.127
SOUTH27	Horizontal	409243	3723086	3.66	4.60	533	18.0	0.127
SOUTH28	Horizontal	409263	3723072	3.66	4.60	533	18.0	0.127
SOUTH29	Horizontal	409284	3723058	3.66	4.60	533	18.0	0.127
SOUTH30	Horizontal	409304	3723043	3.66	4.60	533	18.0	0.127

Amended Huntington Beach Energy Project
Appendix F, Table 5
Amended HBEP Operation with Units 1 and 2 Demolition Stack Parameters
December 2015

Operational Point Sources

Pollutant Scenario	Turbine Load (%)	Source ID	Easting (X) (m)	Northing (Y) (m)	Base Elevation (m)	Stack Height (m)	Temperature (K)	Exit Velocity (m/s)	Stack Diameter (m)
CO, 1-hour NO_2, 1-hour SO_2	45	GE 7FA.05-01 Scenario 3	409449	3723146	3.66	45.7	350	12.2	6.10
		GE 7FA.05-02 Scenario 3	409474	3723182	3.66	45.7	350	12.2	6.10
1-hour NO_2 (federal), Annual NO_2, 3-hour SO_2, 24-hour SO_2, PM_{10}, $PM_{2.5}$	44	GE 7FA.05-01 Scenario 7	409449	3723146	3.66	45.7	350	11.8	6.10
		GE 7FA.05-02 Scenario 7	409474	3723182	3.66	45.7	350	11.8	6.10
1-hour SO_2	100	GE LMS 100PB-01 Scenario 1	409149	3723193	3.66	24.4	694	33.3	4.11
		GE LMS 100PB-02 Scenario 1	409185	3723168	3.66	24.4	694	33.3	4.11
CO, 1-hour NO_2	50	GE LMS 100PB-01 Scenario 3	409149	3723193	3.66	24.4	748	23.8	4.11
		GE LMS 100PB-02 Scenario 3	409185	3723168	3.66	24.4	748	23.8	4.11
3-hour SO_2, 24-hour SO_2	100	GE LMS 100PB-01 Scenario 4	409149	3723193	3.66	24.4	697	33.1	4.11
		GE LMS 100PB-02 Scenario 4	409185	3723168	3.66	24.4	697	33.1	4.11
Annual NO_2	75	GE LMS 100PB-01 Scenario 6	409149	3723193	3.66	24.4	709	28.4	4.11
		GE LMS 100PB-02 Scenario 6	409185	3723168	3.66	24.4	709	28.4	4.11
1-hour NO_2 (federal), PM_{10}, $PM_{2.5}$	50	GE LMS 100PB-01 Scenario 7	409149	3723193	3.66	24.4	748	23.6	4.11
		GE LMS 100PB-02 Scenario 7	409185	3723168	3.66	24.4	748	23.6	4.11
All Pollutants	100	Auxiliary Boiler	409438	3723236	3.66	24.4	432	21.2	0.91

This table contains the same information presented in Appendix 5.1C, Table 5.1C.19 of the HBEP PTA, with the exception of the turbine load.

Amended Huntington Beach Energy Project

Appendix F, Table 6

Amended HBEP Operation with Units 1 and 2 Demolition Emission Rates

December 2015

Emission Rates for 1-hour, 3-hour, 8-hour, and 24-hour Modeling

	1-hour NO_2		1-hour NO_2 (federal)		1-hour CO		8-hour CO		1-hour SO_2		3-hour SO_2		24-hour SO_2		24-hour PM_{10}		24-hour $PM_{2.5}$	
Source ID	(g/s)	(lb/hr)	(g/s)	(lb/hr)	(g/s)	(lb/hr)	(g/s)	(lb/hr)	(g/s)	(lb/hr)	(g/s)	(lb/hr)	(g/s)	(lb/hr)	(g/s)	(lb/hr)	(g/s)	(lb/hr)
FUG	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.010	0.082	0.0012	0.0094
EXH [b]	0.043	0.34	0.043	0.34	0.48	3.80	0.48	3.80	0.00081	0.0064	0.00081	0.0064	0.00034	0.0027	0.00054	0.0043	0.00054	0.0043
GE 7FA.05-01	7.69	61.0	7.18	57.0	41.0	325	12.0	95.2	0.37	2.95	0.35	2.79	0.35	2.79	1.07	8.50	1.07	8.50
GE 7FA.05-02	7.69	61.0	7.18	57.0	41.0	325	12.0	95.2	0.37	2.95	0.35	2.79	0.35	2.79	1.07	8.50	1.07	8.50
GE LMS 100PB 01	2.67	21.2	2.67	21.2	5.66	44.9	1.89	15.0	0.20	1.63	0.21	1.64	0.21	1.64	0.79	6.24	0.79	6.24
GE LMS 100PB 02	2.67	21.2	2.67	21.2	5.66	44.9	1.89	15.0	0.20	1.63	0.21	1.64	0.21	1.64	0.79	6.24	0.79	6.24
Auxiliary Boiler	0.054	0.42	0.054	0.42	0.36	2.83	0.30	2.37	0.0061	0.048	0.0061	0.048	0.0031	0.025	0.020	0.160	0.020	0.160
Maximum Month	113		113		113		113		113		113		113		113		113	

Emission Rates for Annual Modeling

	Annual NO_2		Annual PM_{10}		Annual $PM_{2.5}$	
Source ID	(g/s)	(lb/hr)	(g/s)	(lb/hr)	(g/s)	(lb/hr)
FUG	-	-	0.0078	0.062	0.00090	0.0071
EXH [b]	0.013	0.10	0.00039	0.0031	0.00039	0.0031
GE 7FA.05-01	1.02	8.12	0.81	6.42	0.81	6.42
GE 7FA.05-02	1.02	8.12	0.81	6.42	0.81	6.42
GE LMS 100PB 01	0.27	2.11	0.18	1.43	0.18	1.43
GE LMS 100PB 02	0.27	2.11	0.18	1.43	0.18	1.43
Auxiliary Boiler	0.030	0.23	0.019	0.15	0.019	0.15
Maximum Months	109-120		109-120		109-120	

[a] This table contains the same information presented in Appendix 5.1C, Table 5.1C.20 of the HBEP PTA, with the excpetion of the GE 7FA.05 PM_{10}/$PM_{2.5}$ emission rates, annual GE LMS 100PB emission rates, and all auxiliary boiler emission rates.

[b] Emission rates for exhaust sources are the total for all sources.

Amended Huntington Beach Energy Project

Appendix F, Table 7

Amended HBEP Operation with Units 1 and 2 Demolition Building Parameters

December 2015

Building Name	Number of Tiers	Tier Number	Base Elevation (m)	Tier Height (m)	Number of Corners	Corner 1 East (X) (m)	Corner 1 North (Y) (m)	Corner 2 East (X) (m)	Corner 2 North (Y) (m)	Corner 3 East (X) (m)	Corner 3 North (Y) (m)	Corner 4 East (X) (m)	Corner 4 North (Y) (m)	Corner 5 East (X) (m)	Corner 5 North (Y) (m)	Corner 6 East (X) (m)	Corner 6 North (Y) (m)	Corner 7 East (X) (m)	Corner 7 North (Y) (m)	Corner 8 East (X) (m)	Corner 8 North (Y) (m)	Corner 9 East (X) (m)	Corner 9 North (Y) (m)
'AIRIN3'	1	-	3.66	21.6	9	409385	3723198	409377	3723187	409384	3723182	409387	3723182	409395	3723177	409401	3723185	409393	3723191	409391	3723194	409385	3723198
'AIRIN4'	1	-	3.66	21.6	9	409426	3723221	409421	3723213	409412	3723218	409409	3723219	409402	3723223	409410	3723234	409416	3723230	409418	3723227	409426	3723221
'HRSG1'	1	-	3.66	25.6	5	409424	3723169	409447	3723152	409443	3723145	409418	3723162	409424	3723169								
'HRSG2'	1	-	3.66	25.6	5	409449	3723205	409473	3723188	409468	3723182	409444	3723198	409449	3723205								
'ACC'	1	-	3.66	33.5	5	409549	3723302	409551	3723173	409512	3723173	409510	3723301	409549	3723302								
'STG'	1	-	3.66	17.9	5	409482	3723251	409490	3723251	409490	3723235	409482	3723235	409482	3723251								
'WALL1'	1	-	3.66	15.2	9	409566	3723274	409567	3723158	409519	3723157	409437	3723109	409436	3723110	409519	3723158	409566	3723159	409565	3723274	409566	3723274
'WALL2'	1	-	3.66	6.10	7	409447	3723302	409427	3723301	409402	3723266	409402	3723265	409427	3723301	409447	3723301	409447	3723301				
'AIRIN1'	1	-	3.66	15.6	5	409161	3723216	409148	3723225	409142	3723217	409155	3723207	409161	3723216								
'AIRIN2'	1	-	3.66	15.6	5	409196	3723179	409202	3723187	409216	3723178	409210	3723169	409196	3723179								
'CTG1'	1	-	3.66	9.45	7	409160	3723207	409158	3723209	409151	3723201	409147	3723197	409153	3723193	409156	3723198	409160	3723207				
'CTG2'	1	-	3.66	9.45	7	409194	3723184	409197	3723182	409192	3723172	409190	3723168	409184	3723172	409187	3723176	409194	3723184				

This table contains the same information presented in Appendix 5.1C, Table 5.1C.21 of the HBEP PTA.

Amended Huntington Beach Energy Project
Appendix F, Table 8
Amended HBEP Operation with Units 1 and 2 Demolition Results
December 2015

		NO_2 (µg/m^3)			CO (µg/m^3)		SO_2 (µg/m^3)				PM_{10} (µg/m^3)		$PM_{2.5}$ (µg/m^3)	
Source	Year	1-hour [a]	1-hour (federal) [b]	Annual [a]	1-hour	8-hour	1-hour	1-hour (federal)	3-hour	24-hour	24-hour	Annual	24-hour	Annual
ALL	2010	89.2	137	0.75	597	117	5.42	4.82	4.37	1.52	4.99	0.93	2.85	0.59
Exhaust		6.20	6.03	0.40	88.6	72.4	0.15	0.15	0.14	0.029	0.046	0.016	0.041	0.016
Fugitive		-	-	-	-	-	-	-	-	-	4.84	0.89	0.41	0.10
Operation		89.0	75.4	0.57	594	114	5.41	4.82	4.36	1.52	4.74	0.56	2.80	0.56
ALL	2011	85.6	124	0.74	574	110	5.21	4.66	4.53	1.22	5.81	0.94	2.74	0.59
Exhaust		6.15	6.02	0.40	87.8	73.2	0.15	0.15	0.14	0.026	0.042	0.016	0.039	0.016
Fugitive		-	-	-	-	-	-	-	-	-	5.67	0.90	0.45	0.10
Operation		85.2	71.0	0.57	569	107	5.20	4.66	4.53	1.22	3.85	0.56	2.73	0.56
ALL	2012	90.1	130	0.80	604	125	5.50	4.85	5.03	1.66	5.60	1.00	3.04	0.64
Exhaust		6.13	6.01	0.42	87.6	68.5	0.15	0.15	0.14	0.029	0.047	0.017	0.038	0.017
Fugitive		-	-	-	-	-	-	-	-	-	5.55	0.95	0.46	0.11
Operation		89.8	73.2	0.62	600	121	5.49	4.85	5.02	1.66	5.11	0.61	2.98	0.61
ALL	2013	88.8	117	0.79	595	108	5.41	4.93	4.75	1.28	5.35	1.00	3.35	0.65
Exhaust		6.22	6.08	0.41	88.9	76.2	0.15	0.15	0.14	0.027	0.043	0.016	0.039	0.016
Fugitive		-	-	-	-	-	-	-	-	-	5.16	0.95	0.45	0.11
Operation		88.5	74.1	0.63	591	105	5.40	4.93	4.75	1.28	4.00	0.63	3.33	0.63
ALL	2014	94.8	123	0.81	634	113	5.77	5.06	4.69	1.56	5.10	0.93	3.41	0.66
Exhaust		6.23	6.08	0.38	89.0	71.5	0.15	0.15	0.14	0.028	0.045	0.015	0.038	0.015
Fugitive		-	-	-	-	-	-	-	-	-	4.97	0.87	0.46	0.10
Operation		94.5	76.0	0.64	631	109	5.77	5.06	4.69	1.56	4.92	0.64	3.38	0.64

[a] The maximum 1-hour and annual NO_2 concentrations include ambient NO_2 ratios of 0.80 (EPA, 2011) and 0.75 (EPA, 2005), respectively.
[b] The total predicted concentration for the federal 1-hour NO_2 standard is the high-8th-high modeled concentration paired with 98th percentile seasonal hour-of-day background concentrations for 2010 through 2012.

Appendix G
Public Health Impact Analysis—Construction Health Risk Assessment

Amended Huntington Beach Energy Project
Appendix G, Table 1
Cancer Impacts due to Diesel Particulate Matter
Demolition and Construction Health Risk Assessment
December 2015

Modeled Concentrations
Maximum annual impact of annualized project emissions

PMI	0.01027	$\mu g/m^3$	Diesel PM
MEIR	0.00832	$\mu g/m^3$	Diesel PM
Sensitive	0.00095	$\mu g/m^3$	Diesel PM
MEIW	0.01027	$\mu g/m^3$	Diesel PM

Demolition and Construction HRA per the 2015 OEHHA Guidance
Residential Calculation Procedure for Cancer Risks

PMI

Year	0 (3rd tri)	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Dose (mg/kg/day)	3.56E-06	1.07E-05	1.07E-05	8.49E-06	8.49E-06	8.49E-06	8.49E-06	8.49E-06	8.49E-06	7.35E-06	7.35E-06	7.35E-06	7.35E-06	7.35E-06	7.35E-06	7.35E-06
Risk	1.19E-07	1.44E-06	1.44E-06	2.88E-07	2.88E-07	2.88E-07	2.88E-07	2.88E-07	2.88E-07	2.49E-07	2.49E-07	2.49E-07	2.49E-07	2.49E-07	2.49E-07	2.49E-07
Rolling 10-yr Risk											5.22E-06	3.91E-06	2.73E-06	2.69E-06	2.65E-06	2.61E-06
Risk per Million											5.22	3.91	2.73	2.69	2.65	2.61

Year	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
Dose (mg/kg/day)	3.30E-06	3.30E-06	3.30E-06	3.30E-06	3.30E-06	3.30E-06	3.30E-06	3.30E-06	3.30E-06	3.30E-06	3.30E-06	3.30E-06	3.30E-06	3.30E-06	3.30E-06
Risk	3.79E-08	3.79E-08	3.79E-08	3.79E-08	3.79E-08	3.79E-08	3.79E-08	3.79E-08	3.79E-08	3.79E-08	3.79E-08	3.79E-08	3.79E-08	3.79E-08	3.79E-08
Rolling 10-yr Risk	2.36E-06	2.11E-06	1.86E-06	1.65E-06	1.44E-06	1.22E-06	1.01E-06	8.02E-07	5.90E-07	3.79E-07	3.79E-07	3.79E-07	3.79E-07	3.79E-07	3.79E-07
Risk per Million	2.36	2.11	1.86	1.65	1.44	1.22	1.01	0.80	0.59	0.38	0.38	0.38	0.38	0.38	0.38

MEIR

Year	0 (3rd tri)	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Dose (mg/kg/day)	2.88E-06	8.71E-06	8.71E-06	6.88E-06	6.88E-06	6.88E-06	6.88E-06	6.88E-06	6.88E-06	5.95E-06	5.95E-06	5.95E-06	5.95E-06	5.95E-06	5.95E-06	5.95E-06
Risk	9.63E-08	1.16E-06	1.16E-06	2.33E-07	2.33E-07	2.33E-07	2.33E-07	2.33E-07	2.33E-07	2.02E-07	2.02E-07	2.02E-07	2.02E-07	2.02E-07	2.02E-07	2.02E-07
Rolling 10-yr Risk											4.23E-06	3.17E-06	2.21E-06	2.18E-06	2.15E-06	2.11E-06
Risk per Million											4.23	3.17	2.21	2.18	2.15	2.11

Year	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
Dose (mg/kg/day)	2.68E-06	2.68E-06	2.68E-06	2.68E-06	2.68E-06	2.68E-06	2.68E-06	2.68E-06	2.68E-06	2.68E-06	2.68E-06	2.68E-06	2.68E-06	2.68E-06	2.68E-06
Risk	3.07E-08	3.07E-08	3.07E-08	3.07E-08	3.07E-08	3.07E-08	3.07E-08	3.07E-08	3.07E-08	3.07E-08	3.07E-08	3.07E-08	3.07E-08	3.07E-08	3.07E-08
Rolling 10-yr Risk	1.91E-06	1.71E-06	1.51E-06	1.33E-06	1.16E-06	9.92E-07	8.21E-07	6.50E-07	4.78E-07	3.07E-07	3.07E-07	3.07E-07	3.07E-07	3.07E-07	3.07E-07
Risk per Million	1.91	1.71	1.51	1.33	1.16	0.99	0.82	0.65	0.48	0.31	0.31	0.31	0.31	0.31	0.31

Sensitive

Year	0 (3rd tri)	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Dose (mg/kg/day)	3.29E-07	9.94E-07	9.94E-07	7.85E-07	7.85E-07	7.85E-07	7.85E-07	7.85E-07	7.85E-07	6.79E-07	6.79E-07	6.79E-07	6.79E-07	6.79E-07	6.79E-07	6.79E-07
Risk	1.10E-08	1.33E-07	1.33E-07	2.67E-08	2.67E-08	2.67E-08	2.67E-08	2.67E-08	2.67E-08	2.31E-08	2.31E-08	2.31E-08	2.31E-08	2.31E-08	2.31E-08	2.31E-08
Rolling 10-yr Risk											4.83E-07	3.62E-07	2.52E-07	2.49E-07	2.45E-07	2.41E-07
Risk per Million											0.48	0.36	0.25	0.25	0.24	0.24

Year	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
Dose (mg/kg/day)	3.06E-07	3.06E-07	3.06E-07	3.06E-07	3.06E-07	3.06E-07	3.06E-07	3.06E-07	3.06E-07	3.06E-07	3.06E-07	3.06E-07	3.06E-07	3.06E-07	3.06E-07
Risk	3.50E-09	3.50E-09	3.50E-09	3.50E-09	3.50E-09	3.50E-09	3.50E-09	3.50E-09	3.50E-09	3.50E-09	3.50E-09	3.50E-09	3.50E-09	3.50E-09	3.50E-09
Rolling 10-yr Risk	2.18E-07	1.95E-07	1.72E-07	1.52E-07	1.33E-07	1.13E-07	9.37E-08	7.42E-08	5.46E-08	3.50E-08	3.50E-08	3.50E-08	3.50E-08	3.50E-08	3.50E-08
Risk per Million	0.22	0.20	0.17	0.15	0.13	0.11	0.09	0.07	0.05	0.04	0.04	0.04	0.04	0.04	0.04

Worker Calculation Procedure for Cancer Risks

MEIW

Year	16	17	18	19	20	21	22	23	24	25
Dose (mg/kg/day)	1.61E-06	1.61E-06	1.61E-06	1.61E-06	1.61E-06	1.61E-06	1.61E-06	1.61E-06	1.61E-06	1.61E-06
Risk	2.52E-08	2.52E-08	2.52E-08	2.52E-08	2.52E-08	2.52E-08	2.52E-08	2.52E-08	2.52E-08	2.52E-08
Rolling 10-yr Risk										2.52E-07
Risk per Million										0.25

Amended Huntington Beach Energy Project
Appendix G, Table 2
Chronic Impacts due to Diesel Particulate Matter
Demolition and Construction Health Risk Assessment
December 2015

Demolition and Construction HRA per the 2015 OEHHA Guidance
Calculation Procedure for Chronic Hazard Index

Receptor Type	Pollutant	Maximum Annual Modeled Concentration ($\mu g/m^3$)	REL ($\mu g/m^3$)	Chronic Hazard Index
PMI	Diesel PM	0.01027	5	0.0021
MEIR	Diesel PM	0.00832	5	0.0017
Sensitive	Diesel PM	0.00095	5	0.00019
MEIW	Diesel PM	0.01027	5	0.0021

Amended Huntington Beach Energy Project
Appendix G, Table 3
Residential Constants for Cancer Risk
Demolition and Construction Health Risk Assessment
December 2015

Dose Constants

Year	0 (3rd tri)	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
BR/BW	361	1090	1090	861	861	861	861	861	861	745	745	745	745	745	745	745	335	335	335	335	335	335	335	335	335	335	335	335	335	335	335
A	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
EF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Conversion	0.000001	0.000001	0.000001	0.000001	0.000001	0.000001	0.000001	0.000001	0.000001	0.000001	0.000001	0.000001	0.000001	0.000001	0.000001	0.000001	0.000001	0.000001	0.000001	0.000001	0.000001	0.000001	0.000001	0.000001	0.000001	0.000001	0.000001	0.000001	0.000001	0.000001	0.000001

Risk Constants

Year	0 (3rd tri)	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
CPF (Diesel PM)	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1
ASF	10	10	10	3	3	3	3	3	3	3	3	3	3	3	3	3	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
ED	0.25	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
AT	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70
FAH	0.85	0.85	0.85	0.72	0.72	0.72	0.72	0.72	0.72	0.72	0.72	0.72	0.72	0.72	0.72	0.72	0.73	0.73	0.73	0.73	0.73	0.73	0.73	0.73	0.73	0.73	0.73	0.73	0.73	0.73	0.73

A. <u>Equation 5.4.1.1</u>: **Dose-air = C_{air} × {BR/BW} × A × EF × 10^{-6}**

1. Dose-air = Dose through inhalation (mg/kg/d)
2. C_{air} = Concentration in air (µg/m^3)
3. {BR/BW} = Daily Breathing rate normalized to body weight (L/kg body weight - day)
4. A = Inhalation absorption factor (unitless)
5. EF = Exposure frequency (unitless), days/365 days
6. 10^{-6} = Micrograms to milligrams conversion, liters to cubic meters conversion

a: Recommended default values for EQ 5.4.1.1:

1. {BR/BW} = Daily breathing rates by age groupings, see As supplemental information, the assessor may wish to evaluate the inhalation dose by using the mean point estimates in Table 5.6 to provide a range of breathing rates for cancer risk assessment to the risk manager.
2. Table (point estimates) and Table 5.7 (parametric model distributions for Tier III stochastic risk assessment). For Tier 1 residential estimates, use 95th percentile breathing rates in Table 5.6.
3. A = 1
4. EF = 0.96 (350 days/365 days in a year for a resident)

A. <u>Equation 8.2.4 A</u>: **$RISK_{inh-res}$ = $DOSE_{air}$ × CPF × ASF × ED/AT × FAH**

7. $RISK_{inh-res}$ = Residential inhalation cancer risk
8. $DOSE_{air}$ = Daily inhalation dose (mg/kg-day)
9. CPF = Inhalation cancer potency factor (mg/kg-day^{-1})
10. ASF = Age sensitivity factor for a specified age group (unitless)
11. ED = Exposure duration (in years) for a specified age group
12. AT = Averaging time for lifetime cancer risk (years)
13. FAH = Fraction of time spent at home (unitless)

a: Recommended default values for EQ 8.2.4 A:

5. $DOSE_{air}$ = Calculated for each age group from Eq. 5.4.1
6. CPF = Substance-specific (see Table 7.1)
7. ASF = See Section 8.2.1
8. ED = 0.25 years for 3rd trimester, 2 years for 0<2, 7 years for 2<9, 14 years for 2<16, 14 years for 16<30, 54 years for 16-70
9. AT = 70 years*
10. FAH = See Table 8.4

Amended Huntington Beach Energy Project
Appendix G, Table 4
Worker Constants for Cancer Risk
Demolition and Construction Health Risk Assessment
December 2015

Dose Constants

Year	16	17	18	19	20	21	22	23	24	25
WAF	1	1	1	1	1	1	1	1	1	1
BR/BW	230	230	230	230	230	230	230	230	230	230
A	1	1	1	1	1	1	1	1	1	1
EF	0.68	0.68	0.68	0.68	0.68	0.68	0.68	0.68	0.68	0.68
Conversion	0.000001	0.000001	0.000001	0.000001	0.000001	0.000001	0.000001	0.000001	0.000001	0.000001

Risk Constants

Year	16	17	18	19	20	21	22	23	24	25
CPF (Diesel PM)	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1
ASF	1	1	1	1	1	1	1	1	1	1
ED	1	1	1	1	1	1	1	1	1	1
AT	70	70	70	70	70	70	70	70	70	70

A. Equation 5.4.1.2 A: **Dose-air = (C_{air} × WAF) × {BR/BW} × A × EF × 10^{-6}**

1. Dose-air = Dose through inhalation (mg/kg/d)
2. C_{air} = Annual average concentration in air (μg/m^3)
3. WAF = Worker air concentration adjustment factor (unitless)
4. {BR/BW} = Eight-hour breathing rate normalized to body weight (L/kg body weight - day)
5. A = Inhalation absorption factor (unitless)
6. EF = Exposure frequency (unitless), days/365 days)
7. 10^{-6} = Micrograms to milligrams conversion, Liters to cubic meters conversion

a: Recommended default values for EQ 5.4.1.2 A:

1. WAF = See EQ. 5.4.1.2 B for formula to calculate WAF, or App. M for refined post-processing modeling to calculate WAF.
2. {BR/BW} = For workers, use age16-70 year, 95th percentile, moderate intensity 8-hour point estimate breathing rates (see Table 5.8). No worker breathing rate distributions exist for stochastic risk assessment.
3. A = 1
4. EF = 0.68 (250 days / 365 days). Equivalent to working 5 days/week, 50 weeks/year.

b: Assumption for EQ 5.4.1.2 A:

1. The fraction of chemical absorbed (A) through the lungs is the same fraction absorbed in the study on which the cancer potency factor is based.
2. The source emits during the daylight hours. Calculate WAF (EQ 5.4.1.2 B) if a special post-processing modeling run described in App. M was not completed. For nighttime emissions and exposure scenarios, see Appendix N.

B. Equation 5.4.1.2 B: $WAF = (H_{res} / H_{source}) \times (D_{res} / D_{source}) \times DF$

1. WAF = Worker adjustment factor (unitless)
2. H_{res} = Number of hours per day the annual average residential air concentration is based on (always 24 hours)
3. H_{source} = Number of hours the source operates per day
4. D_{res} = Number of days per week the annual average residential air concentration is based on (always 7 days)
5. D_{source} = Number of days the emitting source operates per week
6. DF = Discount factor, for when the offsite worker's schedule partially overlaps the source's emission schedule

b: Recommended default values for EQ 5.4.1.2 B:

1. DF = 1 for offsite worker's schedule occurring within the source's emission schedule. A site-specific survey may be used to adjust the DF using EQ 5.4.1.2 C.

C. Equation 5.4.1.2 C: $DF = (H_{coincident} / H_{worker}) \times (D_{coincident} / D_{worker})$

1. $H_{coincident}$ = Number of hours per day the offsite worker's schedule and the source's emission schedule coincide
2. H_{worker} = Number of hours the offsite worker works per day
3. $D_{coincident}$ = Number of days per week the offsite worker's schedule and the source's emission schedule coincide
4. D_{worker} = Number of days the offsite worker works per week

B. Equation 8.2.4 B: $RISK_{inh\text{-}work} = DOSE_{air} \times CPF \times ASF \times ED/AT$

1. $RISK_{inh\text{-}work}$ = Worker inhalation cancer risk

a: Recommended default values for EQ 8.2.4 B:

1. $DOSE_{air}$ = Calculated for workers in Eq. 5.4.1.2
2. CPF = Substance specific (see Table 7.1)
3. ASF = 1 for working age 16-70 yrs (See Section 8.2.1)
4. ED = 25 years
5. AT = 70 yrs for lifetime cancer risk

Traffic and Transportation (28)

PLUME VELOCITY MODELING DATA

BACKGROUND

Staff will evaluate exhaust stack plume velocities at amended HBEP. The project owner provided exhaust stack parameters for the proposed turbines and the auxiliary boiler. Staff needs the exhaust stack parameters for the air cooled condensers (ACC). Staff needs a summary of the operating conditions for the ACC, including heat rejection, exhaust temperature, and exhaust velocity.

DATA REQUEST

A28. Please provide values to complete the table, and additional data as necessary for staff to determine how the heat rejection load varies with ambient conditions and also determine at what ambient conditions ACC cells may be shut down, and for staff to model the thermal plume. The ambient conditions included in this table are a generic example of low, medium, and high ambient conditions and can be changed as necessary to fit the project site. These would include any ACCs/heat rejection components used to provide process cooling for the combined-cycle turbines and the LMS100s.

Response:

Tables A28-1 and A28-2 present the requested data for the combined cycle air cooled condenser and simple cycle fin-fan coolers.

Table A28-1 HBEP Combined Cycle Air Cooled Condenser

Parameter	**HBEP Combined Cycle Air Cooled Condenser**		
Number of Cells	30		
Cell Height (ft)	Air Inlet: 53.1 ft (from grade)		
Cell Diameter (ft)	43.9 ft (L) x 43.1 ft (W)		
Distance Between Cells (ft)	0 ft (adjoining cells share a single column)		
Ambient Temperature	32°F	65.8°F	110°F
Ambient Relative Humidity	87%	58%	8%
Number of Cells in Operation	13	30	28
Heat Rejection (MW)	369.4	378.6	400.9
Outlet Air Temperature (F)	90.9	92.7	142.2
Outlet Air Exit Velocity (ft/s)	2.16	4.84	4.45
Outlet Air Flow (lb/hr)	92,142,000	205,538,400	173,790,000

Table A28-2 HBEP Fin Fan Cooler			
Parameter	**HBEP Simple Cycle Fin-Fan Coolers**		
Number of Cells	14		
Fin-Fan Height (ft)	24		
Fan Diameter (ft)	13		
Ambient Temperature	32°F	65.8°F	110°F
Ambient Relative Humidity	87%	58%	8%
Number of Cells in Operation	12 fans	28 fans	28 fans
Heat Rejection (MBTU/hr)	108.6	108.816	109.6
Exhaust Temperature (°F)	72	72.8	117

Visual Resources (29)

VISIBLE PLUME MODELING DATA

BACKGROUND

Staff will conduct a visible plume modeling analysis to estimate the exhaust stack plume frequency and size characteristics of the existing Units 1 and 2 and the proposed new units to determine the baseline plume conditions and post project amendment conditions. Staff will require additional data to complete this analysis.

DATA REQUEST

A29. Please provide the following information regarding the exhaust parameters for proposed turbines, the auxiliary boiler, and existing Units 1 and 2.

a. Stack Exhaust Temperature;

b. Moisture Content (% by Weight);

c. Mass Flow (1000 lbs/hr), and;

d. Average Molecular Weight (lbs/mole).

The project owner may provide these exhaust parameters, in tabular form (example shown below), for the range of ambient conditions (i.e. ambient temperature and relative humidity) and operating scenarios that can be reasonably expected to occur at the project site location. The ambient conditions included in this table are a generic example of low, medium, and high ambient conditions and can be changed as necessary to fit the project site.

Response: Tables A29-1, A29-2, and A29-3 present the requested data for the combined cycle, simple cycle, and auxiliary boiler.

Table A29-1 HBEP Combined Cycle Stack Data			
Parameters	GE Frame 7FA		
Stack Height (Feet)	150		
Stack Diameter (Feet)	20		
Ambient Temperature	32°F	65.8°F	110°F
Relative Humidity	87%	58%	8%
Full Load Exhaust Temperature (°F)	216	213	221
Full Load Exhaust Moisture Content (wt %)	8.21%	9.23%	9.37%
Full Load Exhaust Flow Rate (1000 lbs/hr)	4,360	4,302	4,268
Full Load Exhaust Average Molecular Weight (% mole)	28.44	28.33	28.29

Table A29-2 HBEP Simple Cycle Stack Data			
Parameters	GE LMS100		
Stack Height (Feet)	80		
Stack Diameter (Feet)	13.5		
Ambient Temperature	32°F	65.8°F	110°F
Relative Humidity	87%	58%	8%
Full Load Exhaust Temperature (°F)	789	794	848
Full Load Exhaust Moisture Content (wt %)	7.87	8.87	9.27
Full Load Exhaust Flow Rate (1000 lbs/hr)	1,754	1,746	1,473
Full Load Exhaust Average Molecular Weight (% mole)	28.43	28.32	28.27

Table A29-3 HBEP Auxiliary Boiler Stack Data	
Parameters	Auxiliary Boiler
Stack Height (Feet)	80
Stack Diameter (Feet)	3
Full Load Exhaust Temperature (°F)	318
Full Load Exhaust Moisture Content (wt %)	10.03
Full Load Exhaust Oxygen Content (wt %)	12.96
Full Load Exhaust Nitrogen Content (wt %)	72.64
Full Load Exhaust CO2 Content (wt %)	4.36
Full Load Exhaust Flow Rate (acfm)	29,473
Full Load Exhaust Average Molecular Weight (% mole)	28.21

Project Description (30-44)

BACKGROUND

Figure 2.1-2 of the petition to amend (PTA) the Huntington Beach Energy Project (hereafter amended HBEP; see AES 2015) lacks a legend, leaving the reader to wonder what the individual components in the figure represent.

DATA REQUEST

A30. Please revise Figure 2.1-2 to include a legend that identifies the project features.

Response: Figure 2.1-2b and Figure 2.1-2c has been included. The figures include a legend that identifies the project features.

BACKGROUND

The PTA describes the amended HBEP. Staff has identified aspects of the project description that are unclear and raise questions about potential impacts across environmental resource categories. Clarification would ensure staff's ability to assess the analysis contained in the PTA and conduct its own independent analysis, per Title 20, California Code of Regulations, section 1769.

DATA REQUESTS

A31. The PTA states that auxiliary equipment associated with each GE LMS-100 PB simple-cycle combustion gas turbine (CGT) includes generator step-up transformers (AES 2015:2-2). How many generator step-up transformers would be built with each simple-cycle CGT? Where would the generator step-up transformers be located on the project site? What horizontal and vertical ground disturbance would be involved?

Response: Please see attached Figure 2.1-2C (and its legend) that provides the general arrangement for the GE LMS-100s power block with a description of the project components. The expected horizontal and vertical ground disturbance for the generator step-up (GSU) transformers will be similar if not identical to the licensed HBEP GSU transformers.

However, and far more important, during the licensing process for HBEP, the Project Owner submitted substantial documentation into the record (including historic photographs showing the depth and area of ground disturbance during construction of the existing Huntington Beach Generating Station) that documented the extensive surface and subsurface disturbance throughout the Amended HBEP site, and throughout the existing Huntington Beach Generating Station.

Notwithstanding the extensive existing surface and subsurface disturbance at the existing HBGS, the existing Conditions of Certification will ensure that appropriate measures are taken/implemented during project construction to minimize potential effects, if any, on the environment.

A32. The PTA states that auxiliary equipment associated with each GE LMS-100 PB simple-cycle CGT includes auxiliary transformers (AES 2015:2-2). How many auxiliary transformers would be built with each simple-cycle CGT? Where would the auxiliary transformers be located on the project site? What horizontal and vertical ground disturbance would be involved?

Response: See the response to Data Request A31.

A33. The PTA states that the existing fire water distribution system and process water distribution and storage system would be used, but that some modifications would be required (AES 2015:2-3). What is the nature of these modifications, where would they be made, and what horizontal and vertical ground disturbance would be involved?

Response: The modifications to the existing fire water distribution system and process water distribution storage system will be determined as part of the final design for the Amended HBEP so this information is not available at this time. The expected horizontal and vertical ground disturbance for the fire water and process water distribution system will be similar if not identical to the licensed HBEP fire water and process water distribution system. Regarding the fire water distribution system, the Project Owner will coordinate directly with the City of Huntington Beach Fire Department on modifications to the fire water distribution system.

However, and far more important, during the licensing process for HBEP, the Project Owner submitted substantial documentation into the record (including historic photographs showing the depth and area of ground disturbance during construction of the existing Huntington Beach Generating Station) that documented the extensive surface and subsurface disturbance throughout the Amended HBEP site, and throughout the existing Huntington Beach Generating Station.

Notwithstanding the extensive existing surface and subsurface disturbance at the existing HBGS, the existing Conditions of Certification will ensure that appropriate measures are taken/implemented during project construction to minimize potential effects, if any, on the environment.

A34. Would the two new gas metering stations (see AES 2015:2-3) be built at the same locations as in the Licensed HBEP? If not, where would they be built? What is the planned horizontal and vertical extent of excavation at the proposed locations of the two new gas metering stations?

Response: The location of the two new gas metering stations will be determined in coordination with the Southern California Gas Company (SoCalGas) as part of the final design for the Amended HBEP so this information is not available at this time. However, and far more important, during the licensing process for HBEP, the Project Owner submitted substantial documentation into the record (including historic photographs showing the depth and area of ground disturbance during construction of the existing Huntington Beach Generating Station) that documented the extensive surface and subsurface disturbance throughout the Amended HBEP, and throughout the existing Huntington Beach Generating Station.

Notwithstanding the extensive existing surface and subsurface disturbance at the existing HBGS, the existing Conditions of Certification will ensure that appropriate measures are taken/implemented during project construction to minimize potential effects, if any, on the environment.

A35. The project owner proposes to demolish the existing natural gas metering station (AES 2015:2-8). What is the vertical and horizontal extent of excavation required to demolish this project element?

Response: The demolition of the existing natural gas metering stations will be determined in coordination with the Southern California Gas Company (SoCalGas). However, and far more important, during the licensing process for HBEP, the Project Owner submitted substantial documentation into the record (including historic photographs showing the depth and area of ground disturbance during construction of the existing Huntington Beach Generating Station) that documented the extensive surface and subsurface disturbance throughout the Amended HBEP, and throughout the existing Huntington Beach Generating Station.

Notwithstanding the extensive existing surface and subsurface disturbance at the existing HBGS, the existing Conditions of Certification will ensure that appropriate measures are taken/implemented during demolition and project construction to minimize potential effects, if any, on the environment.

A36. The PTA's discussion of the proposed wastewater discharge pipeline contains the statement, "…similar to the Licensed HBEP, process wastewater and stormwater…" (AES 2015:2-4). What is dissimilar between the Licensed and amended HBEPs with respect to the process wastewater and stormwater—flows, locations of the pipelines, depth of excavations?

Response: The primary difference will be the specific location of the connection to the onsite existing wastewater and stormwater discharge system that will be determined during the final design for Amended HBEP; therefore, this information is not available at this time. However, and far more important, during the licensing process for HBEP, the Project Owner submitted substantial documentation into the record (including historic photographs showing the depth and area of ground disturbance during construction of the existing Huntington Beach Generating Station) that documented the extensive surface and subsurface disturbance throughout the Amended HBEP, and throughout the existing Huntington Beach Generating Station.

Notwithstanding the extensive existing surface and subsurface disturbance at the existing HBGS, the existing Conditions of Certification will ensure that appropriate measures are taken/implemented during project construction to minimize potential effects, if any, on the environment.

A37. The PTA states that demineralized water would be sent to a 100,000-gallon storage tank (AES 2015:2-10). Would this be an existing tank (under the Licensed HBEP) or a new tank?

Response: As discussed in Section 2.1.8.5 of the PTA, makeup water for Amended HBEP will be produced from the existing Huntington Beach Generating Station water treatment facility, which includes an existing 100,000 gallon storage tank for demineralized water that will support Amended HBEP.

A38. The PTA states that blowdown would be sent to an atmospheric flash tank (AES 2015:2-10). Would this be an existing tank (under the Licensed HBEP) or a new tank?

Response: A new atmospheric flash tank is included in the Amended HBEP design.

A39. The PTA states that wastewater from combustion turbine water washes would be trucked offsite (AES 2015:2-10). Where and in what manner does the project owner propose to dispose of this wastewater?

Response: As discussed in Section 2.1.8.5 of the PTA, this wastewater will be trucked offsite for disposal. There are various facilities that are permitted to receive, treat/dispose of this wastewater stream in the Southern California area and the project owner will contract with an appropriately permitted facility.

A40. The PTA indicates that the project owner proposes to construct a new 650,000- gallon, onsite fire/service water storage tank (AES 2015:2-11). Where would this water storage tank be located, and how extensive would the project owner need to excavate to construct the tank?

Response: This 650,000 gallon fire/service water storage tank is shown (and labeled) on Figure 2.1-3a.

A41. The PTA references the addition of an underground fire water loop and fire hydrants (AES 2015:2-11). Where would the project owner install these features, and how extensive would the associated excavation be?

Response: The location and design underground fire water loop and fire hydrants will be determined in coordination with the Huntington Beach Fire Department and will meet all California Fire Code requirements as part of the final design for the Amended HBEP so this information is not available at this time. During the licensing process for HBEP, the Project Owner submitted substantial documentation into the record (including historic photographs showing the depth and area of ground disturbance during construction of the existing Huntington Beach Generating Station) that documented the extensive surface and subsurface disturbance throughout the Amended HBEP, and throughout the existing Huntington Beach Generating Station.

Notwithstanding the extensive existing surface and subsurface disturbance at the existing HBGS, the existing Conditions of will ensure that appropriate measures are taken/implemented during project construction to minimize potential effects, if any, on the environment.

A42. The demolition activities described in paragraph 3, Section 2.2 of the PTA (AES 2015:2-12) appear identical to the demolition activities described for the Licensed HBEP in paragraph 3, Section 2.2 of the HBEP's application for certification (AES 2012:2-35, 2-36) and the Energy Commission's Final Decision (CEC 2014:2-3). Has the project owner changed anything (such as the depth of excavation) about the demolition of these portions of the HBGS?

Response: The demolition activities described in the Licensed HBEP are expected to be the same for the Amended HBEP.

A43. The PTA notes that perimeter vegetation, possibly including mature eucalyptus and pine trees, would have to be removed to build a new entrance through a perimeter berm to the former Plains All American Tank Farm (AES 2015:5.2-2; Fowler 2015). Please define the vegetation removal and extent of excavation required to construct the new entrance to the tank farm in terms of depth and extent of excavation.

Response: The new entrance to the former Plains All American Tank Farm site will be at the existing "T" intersection of Magnolia Street and Banning Avenue. The existing "T" intersecting is signalized (a 3-way traffic signal as Banning Avenue terminates at Magnolia Street). While the new entrance road has not been designed, the following information is provided to respond to this data request.

The new entrance road to the Plains All American site will extend approximately 150 feet from the Magnolia Street/Banning Street T-intersection through a low portion of the existing Plains All American earthen landscaped berm that is parallel to Magnolia Street. At this location the earthen berm is approximately 10 to 15 feet high, as compared to a berm height of approximately 25 to 30 feet at the existing Plains All American entrance road. Approximately 2 to 3 feet of soil would be graded, re-compacted and a gravel layer placed to form the road base, and the road would be finished with an asphalt layer.

The new entrance road will be 35 to 40 feet wide (allowing 2 lanes in each direction/as a private entrance this road will not require a parking lane on each side of the new road). The existing 3-way signal at the intersection of Banning Avenue and Magnolia Street will be improved to a 4-way signal. The Project Owner will consult with the City of Huntington Beach regarding the reconfigured of the intersection and signalization.

The existing entrance road to Plains All American is single lane track, and absence the new entrance road the existing entrance would need to be widened to allow 2-lanes in each direction. Given the height of the berm at the existing entrance (25 to 30 feet high which is 10 to 15 feet higher than the berm near the Banning Avenue/Magnolia Street intersection), the earth work and grading that would be necessary to widen the existing Plains All American entrance road to 2-lanes in each direction would exceed the earth work and grading required for the new entrance from the Banning Avenue/Magnolia Street intersection.

The new Banning Avenue entrance to Plains All American site would result in the removal of a mix of approximately 20 to 25 eucalyptus/pine trees, turf grass and bushes. The earthen berm adjacent to the existing entrance road to Plains All American is also bordered by eucalyptus and pine trees, turf grass and bushes that would also have to be removed if the existing entrance to Plains All American was widened.

A44. The PTA indicates that the project owner would reconfigure the intersection at Magnolia Street and Banning Avenue (AES 2015:2-14). Please describe what construction activities might be required to reconfigure the intersection, including the depth and horizontal extent of any excavation.

Response: As noted in the response to Data Request A43 above, the entrance to the former Plains All American Tank Farm will be located at the existing “T” intersection of Magnolia Street and Banning Avenue. The existing “T” intersecting is signalized (a 3-way signal as Banning Avenue terminates at Magnolia Street). While the new entrance has not been design, the following information is provided to respond to this data request.

The existing “T” intersection of Magnolia Street and Banning Avenue would require the cutting/removal of the existing curb and sidewalk along Magnolia Street. As noted in Response to DR A43 above, the existing “T” intersecting is signalized (a 3-way signal as Banning Avenue terminates at Magnolia Street). While the modification of this intersection has not been design, the following information is provided to respond to this data request. Approximately 2 to 3 feet of soil would be graded, re-compacted and a gravel layer placed to form the road base for the intersection improvements, and then finished with an asphalt layer. The Project Owner will confer with the City of Huntington Beach regarding the upgrade of the traffic signals to reconfigure the intersection to a 4-way signal.

REFERENCES

AES 2012—AES Southland Development, with CH2M Hill. Application for Certification, Huntington Beach Energy Project. Vol. 1. June. Long Beach, CA. Submitted to California Energy Commission, Sacramento. On file, Docket Unit, California Energy Commission, Sacramento. 12-AFC-02. TN 66003.

AES 2015—AES Southland Development, with CH2M Hill. Petition to Amend Huntington Beach Energy Center (12-AFC-02C). September. Long Beach, CA. Submitted to California Energy Commission, Sacramento. On file, Docket Unit, California Energy Commission, Sacramento. 12-AFC-2C. TN 206087.

CEC 2014—California Energy Commission. Huntington Beach Energy Project, Final Decision. November. Sacramento, CA. CEC-800-2014-001-CMF. On file, Docket Unit, California Energy Commission, Sacramento. 12-AFC-02. TN 203309.

Fowler 2015—Melissa Fowler. Huntington Beach Energy Project: Biological Reconnaissance Survey for Plains All American Tank Farm. September 2. CH2M Hill. Prepared for AES Southland Development. Appendix 5.2A to *Petition to Amend Huntington Beach Energy Center (12-AFC-02C)*, by AES Southland Development, with CH2M Hill. September. Long Beach, CA. Submitted to California Energy Commission, Sacramento. On file, Docket Unit, California Energy Commission, Sacramento. 12-AFC-2C. TN 206087.

Cultural Resources (45-53)

BACKGROUND

The petition to amend (PTA) discloses that CH2M Hill, the project owner's environmental consultant, conducted an updated literature search on July 7, 2015 (AES 2015:5.3-2). Judging by the PTA's description of the updated records search, staff assumes that the consultant conducted it at the South Central Coastal Information Center (SCCIC) of the California Historical Resources Information System (CHRIS) using a buffer of 1 mile surrounding the former Plains All American Tank Farm property.

DATA REQUESTS

A45. Please confirm whether the updated literature search was conducted at the SCCIC.

Response: An updated literature search was conducted by a CH2M HILL archaeologist at the South Central Coastal Information Center on July 7, 2015.

A46. If the updated records search was conducted at the SCCIC, please provide:

a. a copy of the updated literature search request,

b. any response from the SCCIC regarding the updated literature search,

c. the results map for the updated literature search, and

d. a bibliography of studies and resource records included in the updated literature search (please do not include records from previous literature reviews conducted for the Licensed Huntington Beach Energy Project [HBEP]).

Should any of the items a–d above disclose the location of confidential cultural resources, please submit the requested information under a request for confidential designation (Cal. Code Regs., tit. 20, § 2505).

Response: A buffer of 1 mile was used around the tank farm. A CH2M HILL archaeologist completed the search; therefore, there is no literature search request or response from the SCCIC. Additionally, the CH2M HILL archaeologist added the 1-mile buffer around the tank farm to a map of the literature search results from the original AFC and added new data to the maps from the previous literature search. No new resources were identified. Attachment A46-1 shows the locations of the two additional reports identified from this updated literature search.

BACKGROUND

To assess the completeness and adequacy of the PTA's cultural resources assessment for the Amended HBEP, staff requires a statement of qualifications for the cultural resources personnel that conducted the assessment.

DATA REQUESTS

A47. Please provide a statement of qualifications for Ms. Amy McCarthy Reid, including academic degree, if applicable.

Response: Amy McCarthy Reid, Secretary of Interior-qualified Architectural Historian, conducted all studies related to historic architecture for this project. Ms. McCarthy Reid possesses the following degrees: M.A., Anthropology, Biological Anthropology and Archaeology, San Francisco State University, May 2010;

B.A., Art with the Art History Option and a Second Major in Anthropology with the Biological and Archaeological Option, California State University, Hayward, March 1999.

In addition to more than 10 years of experience as an archaeologist conducting technical studies and impact assessments for compliance with federal laws, including Sections 106 and 110 of the National Historic Preservation Act (NHPA), National Environmental Policy Act (NEPA), and various state laws, such as the CEQA, for clients in both the public and private sector, Ms. McCarthy Reid also has 5 years of experience with historical buildings and structures surveys and evaluations ranging from residential to industrial structures, such as lumber mills and hydroelectric facilities, as well as buildings and structures from the Cold War era.

A48. Please indicate who prepared Section 5.3 (Cultural Resources) of the PTA and provide a statement of qualifications for each contributor[11], including academic degree, if applicable.

Response: Section 5.3 was completed by Natalie Lawson, M.A., RPA, Cultural Resource Specialist (CRS) who meets the qualifications for Principal Investigator stated in the Secretary of the Interior's standards and guidelines for archaeology and historic preservation (U.S. National Park Service [NPS], 1983) and Amy McCarthy Reid, Secretary of Interior-qualified Architectural Historian. The section was reviewed by Clint Helton, M.A., RPA, who meets the qualifications for Principal Investigator stated in the Secretary of the Interior's standards and guidelines for archaeology and historic preservation.

BACKGROUND

The PTA states, "On July 9, 2015, Natalie Lawson, M.A., RPA, performed a pedestrian inventory of the proposed disturbance areas for the amended HBEP to identify prehistoric or historic cultural resources that would be affected by the above- grade demolition of the tanks" (AES 2015:5.3-2). The PTA provides no further description of the pedestrian inventory, leaving staff unable to determine whether Ms. Lawson used appropriate inventory methods.

DATA REQUEST

A49. Please describe the transect intervals and other methods employed during the pedestrian inventory.

Response: The cultural resources survey of the Plains All American Tank Farm was conducted on September 28, 2011, by Natalie Lawson, M.A., RPA, a CRS who meets the qualifications for Principal Investigator stated in the Secretary of the Interior's standards and guidelines for archaeology and historic preservation (NPS, 1995) and Amy McCarthy Reid, M.A. This field survey included all of the proposed disturbance area as well as a 200-foot-minimum buffer around the proposed disturbance area. The surveyed area was covered in 10-meter-wide transects.

BACKGROUND

The PTA states, "Architectural historian, Amy McCarthy Reid, M.A., also completed an intensive survey of the entire Plains All American Tank Farm and a windshield survey of the adjacent parcels on July 9, 2015. This architectural survey included viewing all buildings and structures, and characterizing the adjacent neighborhood." (AES 2015:5.3-2.) The PTA provides no further description of the architectural survey, leaving staff unable to determine whether Ms. Reid used appropriate survey methods, or what constitutes an "intensive survey" in this case.

[11] Staff does not require statements of qualification from Ms. Gloriella Cardenas or Ms. Natalie Lawson, as both archaeologists had worked on the Licensed HBEP.

DATA REQUEST

A50. Please describe Ms. Reid's survey methods and how they constitute an intensive survey.

Response: A CH2M HILL architectural historian, Amy McCarthy Reid, M.A., completed a walking survey of the entire Plains All American Tank Farm and a windshield survey of the adjacent parcels on July 9, 2015. Close examination of the tanks and associated structures was completed during the walking survey. Photographs were taken of various structures on the tank farm. Photographs were taken of buildings on adjacent parcels, as well. The goal of this architectural survey was to view all buildings and structures within the project and within adjacent parcels which may be older than 45 years and to characterize the adjacent neighborhood.

BACKGROUND

The Plains All American Tank Farm (tank farm) falls within the one-parcel built environment survey boundary (Project Area of Analysis or PAA) for the amended project and would be used as a parking area during construction of the amended project. The Plains All American Tank Farm has not been surveyed, evaluated or recorded on DPR forms. Energy Commission siting regulations require recording of potential historic resources that are "45 years or older", not "more than 45 years old" as stated in the petitioner's methodology discussion [(Cal. Code. Regs. ,tit. 20, § 1704 (b)(2), Appendix B(g)(2) (B) and (C)]. Assuming the tank farm dates to 1965, as stated in the PTA (AES 2015; p. 5.3-2), it is now 50 years old. This exceeds the "45 years or older" requirement for recording historic built environment resources within the one- parcel PAA. Additionally, the city of Huntington Beach has prepared an update to the Historic and Cultural Resources Element of the General Plan (Galvin 2014a). Policy HCR 1.1.4 in that draft states "Consider recording the importance of oil history in the city's development (I-HCR-I)". An updated Historic Context and Survey Report (Galvin 2014b) documents the importance of the oil industry on Huntington Beach's development with an entire 12-page section devoted to the subject.

Page 2-14 of the PTA describes construction-related activities that would remove a portion of the earthen berm on the tank farm property to provide a new access road to the property from Magnolia Street. This activity has the potential to affect an historical resource.

DATA REQUEST

A51. Please provide an evaluation of the Plains All American Tank Farm on California Department of Parks and Recreation (DPR) 523 forms (Cal. Code Regs, tit. 14, § 4853) which conforms to the Instructions for Recording Historical Resources published by the California Office of Historic Preservation (OHP 1995).

Response: DPR forms, including a Primary form, a Building, Structure, Object Form, and a Location Map for the Plains All American Tank Farm are provided in Attachment A51-1. The tank farm is a nearly 30-acre site and consists of three tanks and one associated flat roof pump house and valve/manifold structure. These tanks are corrugated metal clad crude oil storage tanks, with a diameter of approximately 300 feet and a height of 40 feet. The tank farm was built between 1963 and 1972. It does not appear on the 1963 aerial photograph nor the 1965 USGS topographic quadrangle map (which is based on the 1963 aerial). It does appear on the 1972 aerial photograph. The period of significance for the oil industry in Huntington Beach is from 1920 to 1950 (Galvin Preservation Associates Inc., 2014b). The last oil boom was in 1953. This tank farm was constructed well after that period. Although it is of historic age, the tank farm does not appear to meet any of the criteria for significance, as it is not related to important events in history (A/1) or any specific person important to history (B/2), does not possess unique or exemplary construction methods or design (C/3), and is not likely to yield important historical information (D/4). Therefore, none of the Plains All American tank farm structures is a significant historic property under Section 106 of the NHPA, nor a historical resource for the purposes of the CEQA.

BACKGROUND

Table 5.3-1 of the PTA summarizes the two cultural resources studies within 1 mile of the former Plains All American Tank Farm (AES 2015:5.3-2). The project owner provided print and PDF copies of one report (Langenwalter and Brock 1985) to the Energy Commission under request for confidential designation (Foster 2015). The project owner did not, however, provide complete bibliographic data for either study, nor did it provide a copy of the second cultural resources study (referred to as Ehringer 2011/OR-04152).

DATA REQUESTS

A52. Please provide full bibliographic entries for the two studies in Table 5.3-1.

Response: Langenwalter, Paul E. and James Brock. 1985. P*hase I Archaeological Studies Prado Basin and the Lower Santa Ana River*.

Ehringer, Candice. 2011. *Outfall Land Section and Ocean Outfall Booster Pump Station Piping Rehabilitation Project Phase 1 Cultural Resources Assessment*. ESA.

A53. Please explain why the Ehringer 2011/OR-04152 report was not provided to staff.

Response: This report is an archaeological survey report for an area located more than ¼ mile from the proposed disturbance area. Because it is not an architectural report or an excavation report, it was not provided to the CEC.

REFERENCES

AES 2012—AES Southland Development, with CH2M HILL. Application for Certification, Huntington Beach Energy Project. Vol. 1. June. Long Beach, CA. Submitted to California Energy Commission, Sacramento. On file, Docket Unit, California Energy Commission, Sacramento. 12-AFC-02. TN 66003.

AES 2015—AES Southland Development, with CH2M HILL. *Petition to Amend Huntington Beach Energy Center (12-AFC-02C)*. September. Long Beach, CA. Submitted to California Energy Commission, Sacramento. On file, Docket Unit, California Energy Commission, Sacramento. 12-AFC-2C. TN 206087.

Foster 2015—Melissa A. Foster. Letter Regarding Huntington Beach Energy Project (12-AFC-2C), Application for Designation of Confidential Cultural Resources Records. September 4. Stoel Rives, Sacramento, CA. Submitted to California Energy Commission, Sacramento.

Galvin 2014a—Galvin Preservation Associates, Inc. *City of Huntington Beach Historic Resources Element. Tracked Changes Draft for Public Review*. Prepared for City of Huntington Beach. June 2014.

Galvin 2014b—Galvin Preservation Associates, Inc. *City of Huntington Beach Historic Resources Context and Survey Report*. Prepared for City of Huntington Beach. Updated 2014.

Langenwalter and Brock 1985—Paul E. Langenwalter and James Brock. *Phase II Archaeological Studies, Prado Basin and the Lower Santa Ana River*. May. ECOS Management Criteria, Cypress, CA. Prepared for Los Angeles District, U.S. Army Corps of Engineers, Los Angeles. Contract No. DACW09-83-C-0033. On file, South Central Coastal Information Center, California Historical Resources Information System, Fullerton. Study OR-00801.

OHP 1995—California Office of Historic Preservation. Instructions for Recording Historical Resources. Sacramento, California. March 1995.

Attachment A51-1
California Department of Parks and Recreation 523 Forms

State of California ♁ The Resources Agency
DEPARTMENT OF PARKS AND RECREATION
PRIMARY RECORD

Primary #
HRI #
Trinomial
NRHP Status Code

Other Listings
Review Code Reviewer Date

***Resource Name or #:** Plains All American Tank Farm

P1. Other Identifier:

***P2. Location:** ☐ **Not for Publication** ☑ **Unrestricted**

***a. County** Orange County
***b. USGS 7.5' Quad** Newport Beach **Date** 1981 **T** n/a ; **R** ; ☐ **of** ☐ **of Sec** ; **B.M.**
c. Address 21845 Magnolia Street City Huntington Beach Zip 92646
d. UTM: Zone 11S, 409787 mE/ 3723237 mN
e. Other Locational Data:

***P3a. Description:**

The tank farm is a nearly 30 acre site and consists of three tanks and one associated flat roof pump house and valve/manifold structure. These tanks are corrugated metal clad crude oil storage tanks, with a diameter of approximately 300 feet and a height of 40 feet. The tank farm was built between 1963 and 1972. It does not appear on the 1963 aerial photograph nor the 1965 USGS topographic quadrangle map (which is based on the 1963 aerial). It does appear on the 1972 aerial photograph.

***P3b. Resource Attributes:** HP11 Engineering Structure

***P4. Resources Present:** ☐ Building ☑ Structure ☐ Object ☐ Site ☐ District ☐ Element of District ☐ Other (Isolates, etc.)

P5a. Photograph or Drawing

P5b. Description of Photo: Tank farm, view north, 7/9/15

***P6. Date Constructed/Age and Source:** ☑ Historic ☐ Prehistoric ☐ Both

***P7. Owner and Address:**
Thomas McClane
Plains All American Pipeline, LP 5900 Cherry Avenue
Long Beach, CA 90805

***P8. Recorded by:**
N. Lawson and A. McCarthy-Reid
CH2M
6 Hutton Centre Drive, Suite 700
Santa Ana, CA 92707

***P9. Date Recorded:** 9 July 2015

***P10. Survey Type:** pedestrian

***P11. Report Citation**:
AES Southland Development LLC, with CH2M Hill. Huntington Beach Energy Center (12-AFC-02C) Data Responses Set 1 (Responses 1 to 74). Submitted to California Energy Commission. Sacramento, CA. December 2015

***Attachments:** ☐NONE ☑Location Map ☐Continuation Sheet ☑Building, Structure, and Object Record ☐Archaeological Record ☐District Record ☐Linear Feature Record ☐Milling Station Record ☐Rock Art Record ☐Artifact Record ☐Photograph Record ☐ Other (List):

State of California ♁ The Resources Agency Primary #
DEPARTMENT OF PARKS AND RECREATION HRI#

BUILDING, STRUCTURE, AND OBJECT RECORD

***Resource Name or #** Plains All American Tank Farm ***NRHP Status Code** 6z

B1. Historic Name: Plains All American Tank Farm
B2. Common Name: Plains All American Tank Farm
B3. Original Use: oil storage
B4. Present Use: empty
B5. Architectural Style: utilitarian
***B6. Construction History:**
The tank farm was built between 1963 and 1972.

***B7. Moved?** ☑**No** ☐**Yes** ☐**Unknown** **Date:** ____________________ **Original Location:**____________________
***B8. Related Features:**
The tank farm is a nearly 30 acre site and consists of three tanks and one associated flat roof pump house and valve/manifold structure. These tanks are corrugated metal clad crude oil storage tanks, with a diameter of approximately 300 feet and a height of 40 feet. The tank farm has been maintained into the modern era.

B9a. Architect: unknown b. Builder: unknown
***B10. Significance: Theme** n/a **Area** n/a
Period of Significance n/a **Property Type** n/a **Applicable Criteria** none
The period of significance for the oil industry in Huntington Beach is from 1920 to 1950 (Galvin Preservation Associates Inc 2014). The last oil boom was in 1953. This tank farm was constructed well after that period. Although it may be of historic age, the tank farm does not appear to meet any of the criteria for significance, as it is not related to important events in history (A/1) or any specific person important to history (B/2), does not possess unique or exemplary construction methods or design (C/3), and is not likely to yield important historical information (D/4). Therefore, none of the Plains All American tank farm structures are a significant historic property under Section 106 of the National Historic Preservation Act (NHPA), nor a historical resource for the purposes of the CEQA.

B11. Additional Resource Attributes: none
***B12. References:**

Shortall, Andrew. November 7, 2012. Company: Wetland pipes may come out. Huntington Beach Independent. Accessed online at: http://articles.hbindependent.com/2012-11-07/news/tn-hbi-plains-all-american-approval-20121106_1_conservancy-chairman-gordon-smith-oil-tanks-pipes

Galvin Preservation Associates, Inc. *City of Huntington Beach Historic Resources Context and Survey Report*. Prepared for City of Huntington Beach. Updated 2014. Accessed online at: http://www.huntingtonbeachca.gov/files/users/planning/Historic_Context_and_Survey_Report_Final_Draft.pdf

Historic aerials viewed through NETR online at http://www.historicaerials.com/

B13. Remarks:
In 2012, the Huntington Beach City Council approved the demolition of these three tanks and over 2000 feet of pipes that extend into the nearby marsh area (Shortall 2012)

***B14. Evaluator:** A. McCarthy-Reid
***Date of Evaluation:** November 23, 2015

(This space reserved for official comments.)

State of California ♁ Natural Resources Agency
DEPARTMENT OF PARKS AND RECREATION
LOCATION MAP

Primary #
HRI#
Trinomial

***Resource Name or #** Plains All American Tank Farm

***Map Name:** Newport Beach ***Scale:** 1:24,000 ***Date of map: 1981**

Socioeconomics (54-56)

CONSTRUCTION AND DEMOLITION WORKFORCE

BACKGROUND

In the Huntington Beach Energy Project (HBEP) Petition to Amend (PTA), there are some discrepancies between Appendix 5.10A and the text on page 2-14. The table shows the peak workforce for the combined-cycle power block would occur in July 2019 (Q3 2019) with 306 workers; the text on page 2-14 states that the peak workforce would occur between the fourth quarter of 2018 and the second quarter of 2019. The table shows a peak workforce for the simple-cycle power block would occur in January 2023 (Q1 2023) with 231 workers; however, page 2-14 of the PTA identifies the peak workforce as 165 workers.

DATA REQUEST

A54. Please confirm the correct peak period for the combined-cycle power block and the correct number of workers during the peak period for the simple-cycle power block.

Response: The construction workforce numbers in revised PTA Appendix Table 5.10A-R1 are the correct numbers for the Amended HBEP. The revised total construction and demolition personnel requirements for the combined-cycle power block will be approximately 6,622 person-months instead of 6,562 reported in the Amended HBEP. The peak workforce for the combined-cycle power block would occur in July 2019 with 306 workers, while for the simple-cycle power block, the peak construction workforce would occur in January 2023 with 231 workers. The revised average workforce for the construction and demolition of the combined-cycle power block will be 127 (instead of the 124 reported in the Amended HBEP) workers while for the simple-cycle power block, the revised average construction workforce will be 93 workers (instead of the 92 reported in the Amended HBEP). The peak construction workforce numbers on page 2-14 of the PTA have been corrected.

PROPOSED CONSTRUCTION

BACKGROUND

The licensed HBEP included the construction of buildings 33 and 34 (control building and maintenance); however, the demolition and construction workforce by trade by month presented in Appendix 5.10A does not include this activity.

DATA REQUEST

A55. Please clarify whether the HBEP PTA includes the construction of buildings 33 and 34 (control building and maintenance), during the last 13 months of the demolition of units 1 and 2, as stipulated in the licensed HBEP.

Response: The HBEP PTA assumes that there are no changes to the construction of Buildings 33 and 34 (control building and maintenance) nor demolition of the Units 1 and 2, which were covered under the Licensed HBEP. Therefore, the construction of Buildings 33 and 34 is expected to occur during the last 13 months of the demolition of Units 1 and 2, as stipulated in the Licensed HBEP.

DEMOLITION WORK AND SCHEDULE

BACKGROUND

The licensed HBEP identified project activities beginning with the 14-month demolition of the peaker and tank area. The HBEP PTA demolition and construction workforce by trade by month presented in Appendix 5.10A shows demolition of the peaker and tank area over a 7-month period, estimated to begin in January 2016.

DATA REQUEST

A56. Please clarify the demolition schedule for the peaker and tank area shown in Appendix 5.10A.

Response: The Amended HBEP demolition schedule has been revised from the 14-month schedule in the Licensed HBEP to the 7-month schedule shown in Appendix 5.10A of the HBEP PTA.

Appendix 5.10A-R1

Construction and Demolition Workforce by Trade by Month, 2x1 7FA.05 Power Block, Plains All American Tank Farm, Demolition of Peaker and Tanks, and the Construction of the 2 LMS 100 Simple-Cycle Power Block

Demoliton - Peaker and Tanks

CRAFT	Month-Year																																																				MAN MONTHS
	2016												2017												2018												2019												2020				
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec	Jan	Feb	Mar	Apr	
Carpenters																																																					0
Laborers	25	25	25	25	10	10	10																																														130
Teamsters	10	10	10	10	4	4	4																																														52
Electricians																																																					0
Iron Workers																																																					0
Millwrights	6	6	6	6																																																	24
Boilermakers																																																					0
Plumbers																																																					0
Pipefitters																																																					0
Oilers / Mechanics	2	2	2	2																																																	8
Operating Engineers	18	18	18	18	6	6	6																																														90
TOTAL CRAFT LABOR	61	61	61	61	20	20	20																																														**304**
TOTAL SUPERVISION	4	4	4	4	2	2	2																																														**22**
TOTAL MANPOWER	**65**	**65**	**65**	**65**	**22**	**22**	**22**																																														**326**

Construction - Plains All American Tank Farm

CRAFT	Month-Year																																																				MAN MONTHS
	2016												2017												2018												2019												2020				
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec	Jan	Feb	Mar	Apr	
Carpenters/Cement Finishers														4	4	4																																					12
Laborers													8	8	8	4	4																																				32
Teamsters													4	4	4	2	2																																				16
Electricians																																																					0
Iron Workers																																																					0
Millwrights																																																					0
Boilermakers																																																					0
Pipefitters																																																					0
Insulation Workers																																																					0
Operating Engineers													9	9	9	7	7																																				41
Sheetmetal Workers																																																					0
Painters															2	2	2																																				6
TOTAL CRAFT LABOR													21	25	27	19	15																																				107
TOTAL SUPERVISION													1	1	1	1	1																																				5
TOTAL MANPOWER													22	26	28	20	16																																				112

Construction - Huntington Beach 2x1

CRAFT	Month-Year																																																				MAN MONTHS
	2016												2017												2018												2019												2020				
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec	Jan	Feb	Mar	Apr	
Piling Crew																								8	8	8	8																										32
Carpenters																								8	14	16	18	20	20	20	24	24	24	24	22	18	15	13	12														292
Laborers																								8	12	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	4	4	2	414
Teamsters																								2	4	4	4	5	5	6	7	7	7	7	7	7	7	7	7	7	7	7	7	7	5	5	5	3					146
Electricians																								16	18	24	24	24	28	34	36	48	54	54	54	60	60	60	60	60	60	60	54	54	52	48	36	24	6	4	4	2	1,118
Ironworkers																								8	10	10	12	12	12	12	12	12	14	14	14	14	14	14	14	10	8												216
Millwrights																															4	6	8	12	12	12	12	12	12	12	12	12	12	12	10	8	6	4	4	2	2	2	188
Boilermakers																															8	10	12	20	36	48	48	48	48	48	48	48	48	48	48	48	40	36					690
Plumbers																																						2	2	2	2	2	2	2	2	2	2	2	2				24
Pipefitters																								11	15	20	22	24	30	38	48	48	54	58	58	58	58	58	58	58	58	58	58	58	58	58	50	48	22	4	4	4	1,196
Insulation workers																																								8	10	12	30	30	30	24	18	12					174
Operating Enginneers																								6	8	10	10	12	12	12	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	2	2	2	2	330
Oilers / Mechanics																								1	1	1	1	1	1	1	1	1	1	1	2	2	2	2	2	2	2	2	2	2									31
Cement Finishers																								2	3	3	4	4	4	4	4	4	4	4	4	4	4	4	4														60
Masons																																																					0
Sheetrockers																																										2	4	4	4	4	2	2					22
Roofers																																						2	2	2	2	2	2										12
Sheetmetal Workers																																																					0
Sprinkler Fitters																																							4	4	4	4	4	4	4	4	4	3					39
Painters																																								2	4	4	6	6	8	8	6	4					48
I & C - Control Room																																			6	7	8	8	8	8	8	8	8	8	8	8	8	7	2	3	3	3	119
TOTAL CRAFT LABOR																		0	0	0	0	0	0	70	93	112	119	118	128	143	174	190	208	224	245	260	258	260	263	253	255	251	267	265	259	247	207	175	54	19	19	15	5,151
TOTAL SUPERVISION (GENERAL FOREMEN)																								3	4	4	4	4	5	5	6	7	7	7	7	7	7	7	7	9	9	9	9	9	9	9	9	9	2	2	2	2	180
TOTAL STAFFING																		4	9	9	10	12	14	23	23	23	23	25	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	24	18	18	18	853
TOTAL MANPOWER																		**4**	**9**	**9**	**10**	**12**	**14**	**96**	**120**	**139**	**146**	**147**	**163**	**178**	**210**	**227**	**245**	**261**	**282**	**297**	**295**	**297**	**300**	**292**	**294**	**290**	**306**	**304**	**298**	**286**	**246**	**214**	**80**	**39**	**39**	**35**	**6,184**
TOTAL MANPOWER: DEMOLITION + CONSTRUCTION	**65**	**65**	**65**	**65**	**22**	**22**	**22**	**0**	**0**	**0**	**0**	**0**	**22**	**26**	**28**	**20**	**16**	**4**	**9**	**9**	**10**	**12**	**14**	**96**	**120**	**139**	**146**	**147**	**163**	**178**	**210**	**227**	**245**	**261**	**282**	**297**	**295**	**297**	**300**	**292**	**294**	**290**	**306**	**304**	**298**	**286**	**246**	**214**	**80**	**39**	**39**	**35**	**6,622**

Construction Workforce by Trade by Month, 2 LMS 100 Simple-Cycle Power Block

CRAFT	Month-Year																				MAN MONTHS
	2022								2023												
	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec	
Carpenters/Cement Finishers	1	4	7	11	13	11	13	14	13	13	9	4	4	4	2	2	2	1	1	0	129
Laborers	3	3	4	11	15	31	30	30	25	15	7	4	4	4	3	3	3	2	2	2	201
Teamsters	1	3	5	7	10	6	6	5	4	4	3	2	1	1	1	1	1	1	1	0	63
Electricians	1	3	4	5	7	8	15	25	32	32	35	33	13	12	10	10	10	5	5	5	270
Iron Workers	0	3	5	31	29	31	31	29	25	22	19	17	8	8	3	3	3	0	0	0	267
Millwrights	0	0	0	7	8	13	25	35	37	38	30	14	10	9	1	1	1	1	1	1	232
Boilermakers	0	0	0	0	0	14	14	14	14	14	14	11	11	11	11	11	11	0	0	0	150
Pipefitters	0	0	0	3	6	9	9	16	35	11	6	4	2	2	1	1	1	0	0	0	106
Insulation Workers	0	0	0	0	0	0	0	5	8	8	17	4	3	3	0	0	0	0	0	0	48
Operating Engineers	1	3	7	7	7	13	13	11	9	4	1	1	1	1	1	1	1	1	1	0	84
Sheetmetal Workers	0	0	0		0	3	6	7	8	7	6	5	2	2	1	1	1	0	0	0	49
Painters	0	0	0	0	0	4	8	8	8	5	4	2	2	2	2	2	2	0	0	0	49
TOTAL CRAFT LABOR	7	19	32	82	95	143	170	199	218	173	151	101	61	59	36	36	36	11	11	8	1,648
TOTAL SUPERVISION	5	8	12	10	16	15	15	15	13	13	15	16	16	16	6	6	6	6	6	6	221
TOTAL MANPOWER	12	27	44	92	111	158	185	214	231	186	166	117	77	75	42	42	42	17	17	14	1,869
TOTAL MANPOWER: DEMOLITION + CONSTRUCTION	12	27	44	92	111	158	185	214	231	186	166	117	77	75	42	42	42	17	17	14	1,869

Transmission System Engineering (57-60)

DATA REQUESTS

Provide a detailed description of the change in design, construction, and operation of any electric transmission facilities, such as generators, transformers, interconnection power lines, substations, switchyards, or other transmission equipment, which will be constructed or modified to transmit electrical power from the Huntington Beach Energy Project PTA (HBEP) to the SCE Huntington Beach Switching Station.

A57. Provide a one-line diagram for the existing SCE Huntington Beach Switching Station after the interconnection of the HBEP project.

- Show bay arrangement of the necessary equipment which is required to interconnect the project.
- Provide ratings of the breakers, disconnect switches, relays, buses, and etc.

Response: Figure 57A-1 presents a revised one-line diagram showing the bay arrangement and rating of breakers, disconnect switches, relays, buses, and conductor ratings.

The Amended HBEP will interconnect to the Southern California Edison (SCE) Huntington Beach Switching Station into the same buss as the Licensed HBEP. As the electrical production for the Amended HBEP is slightly less than the Licensed HBEP (and the existing Huntington Beach Generating Station), no California Independent System Operator (CAISO) approvals are required beyond the CAISO affidavit, previously provided. Changes within the SCE Huntington Beach Switching Station will be determining by SCE and not the Project Owner

A58. Provide generator tie-line conductor type, current carrying capacity, and conductor size.

Response: Figure 57A-1 provides HBEP's generator tie-lines conductor types, current carrying capacity, and conductor size.

A59. Provide at least the following one-line diagrams with the updated information. Show all equipment ratings including generator output, power factor, isolated bus duct ratings, etc. which are required for the project.

- Figure 2.1-4
- Figure 3.1-1

Response: See the response to Data Request A57.

A60. Provide auxiliary load information.

Response: Amended HBEP PTA Figures 2.1-5a and 2.1-5b provide auxiliary load information for the combined cycle power block. Attached Figures 60A-1a and 60A-1b show the auxiliary load for the simple cycle power block.

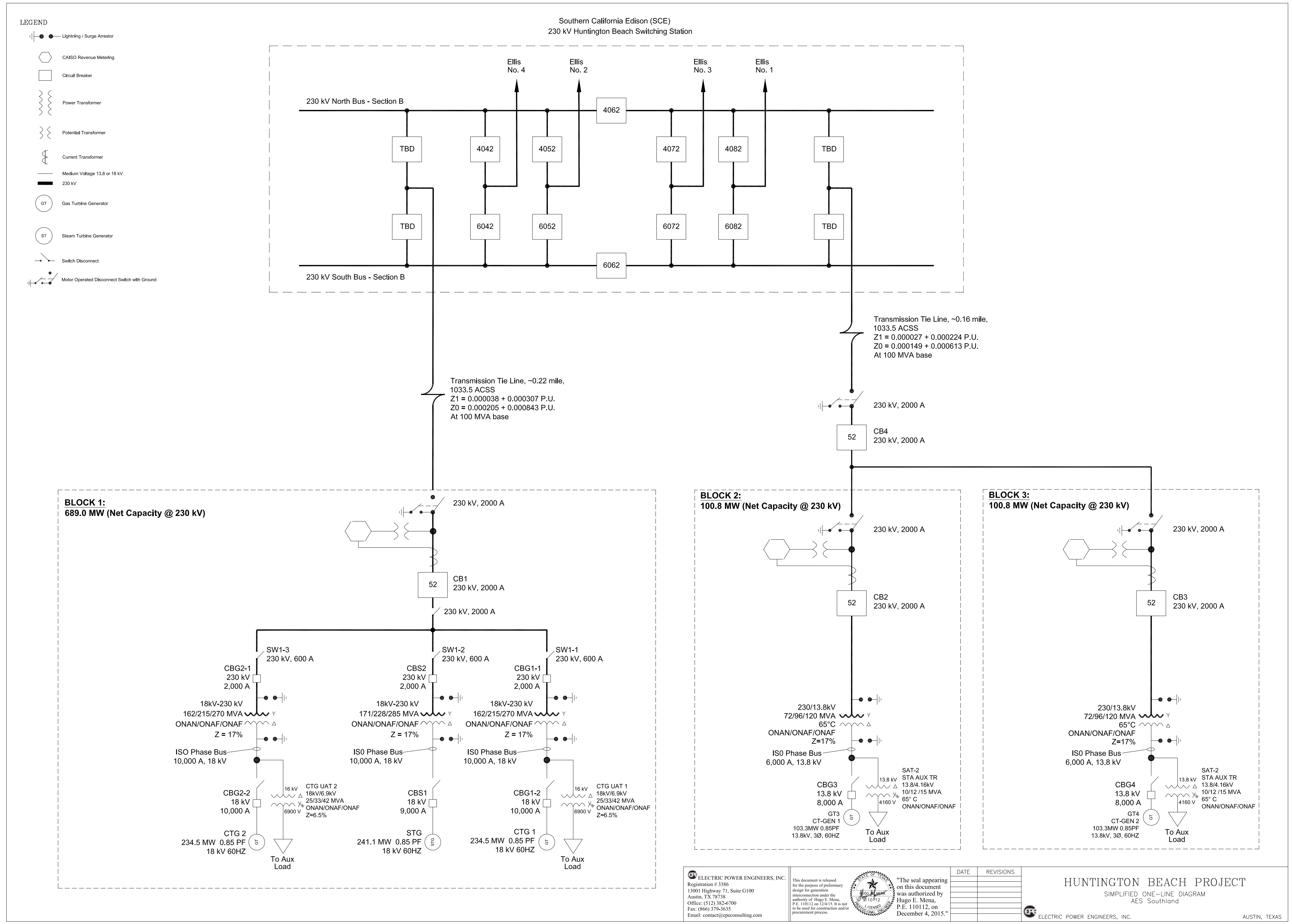
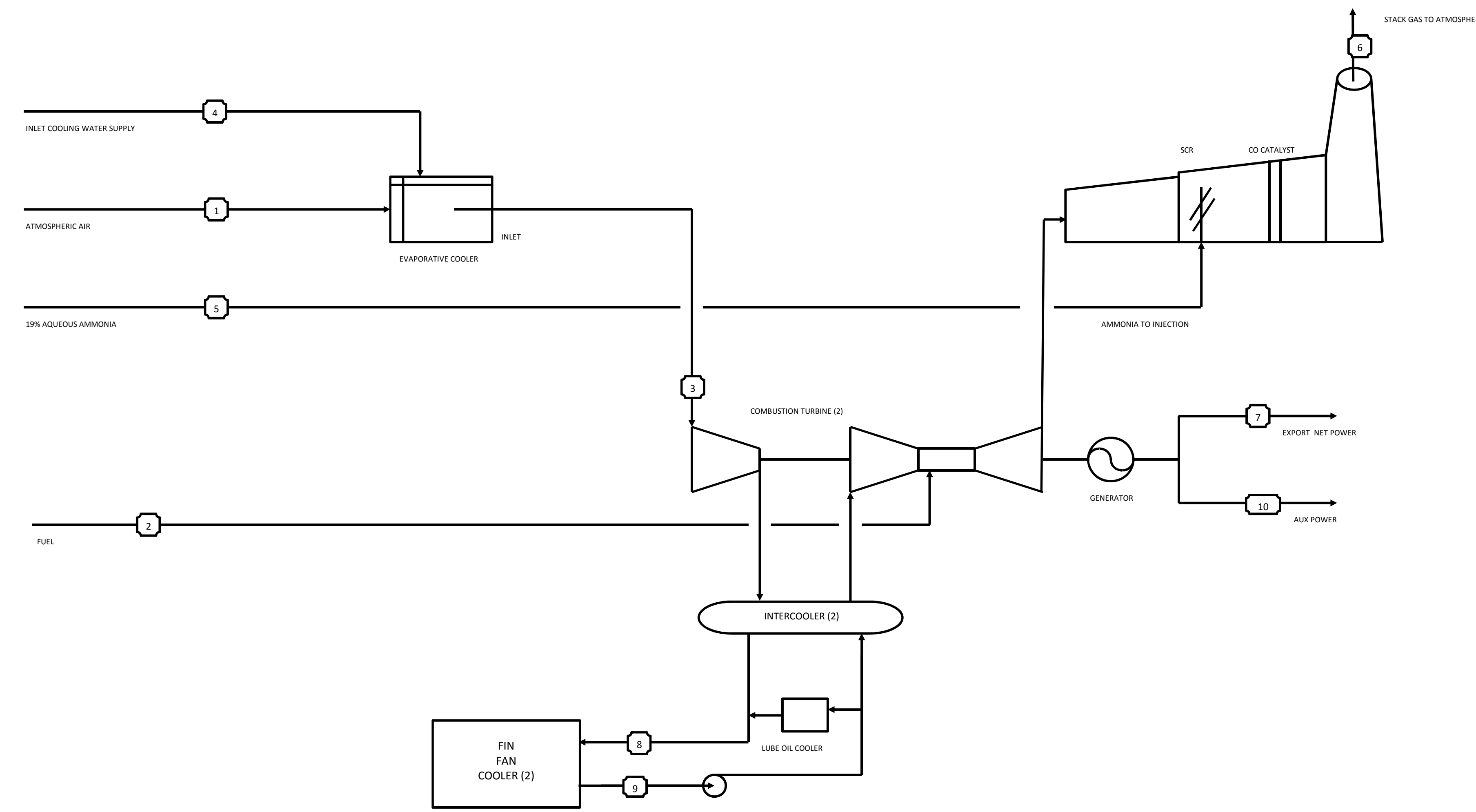


Figure DR 57A-1
One Line Diagram
AES Amended Huntington Beach Energy Project
Huntington Beach, California



HEAT AND MATERIAL BALANCE FOR AMBIENT CONDITIONS											
		DATA REPRESENTS TWO COMBUSTION TURBINE GENERATORS									
	UNITS	1	2	3	4	5	6	7	8	9	10
FLOW	lb/hr	3430482	76682	3430482	-		3508000				
FLOW	gpm					0.8			13600	13600	
TEMPERATURE	dF	32	77	32	-	-	789		68	39	
LHV HEAT INPUT	mmBtu/hr		1585.4								
POWER	KW							192750			8036
NET LHV HEAT RATE	Btu/kwhr							8225			

REV	DATE	DESCRIPTION	DWN	DGN	CHK	APP
0	8/18/2015	FOR REVIEW	MH		JSC	DMP

B SIZE 11" X 17" SCALE : NONE

Power Engineers Collaborative, L.L.C.

100 South Wacker Drive
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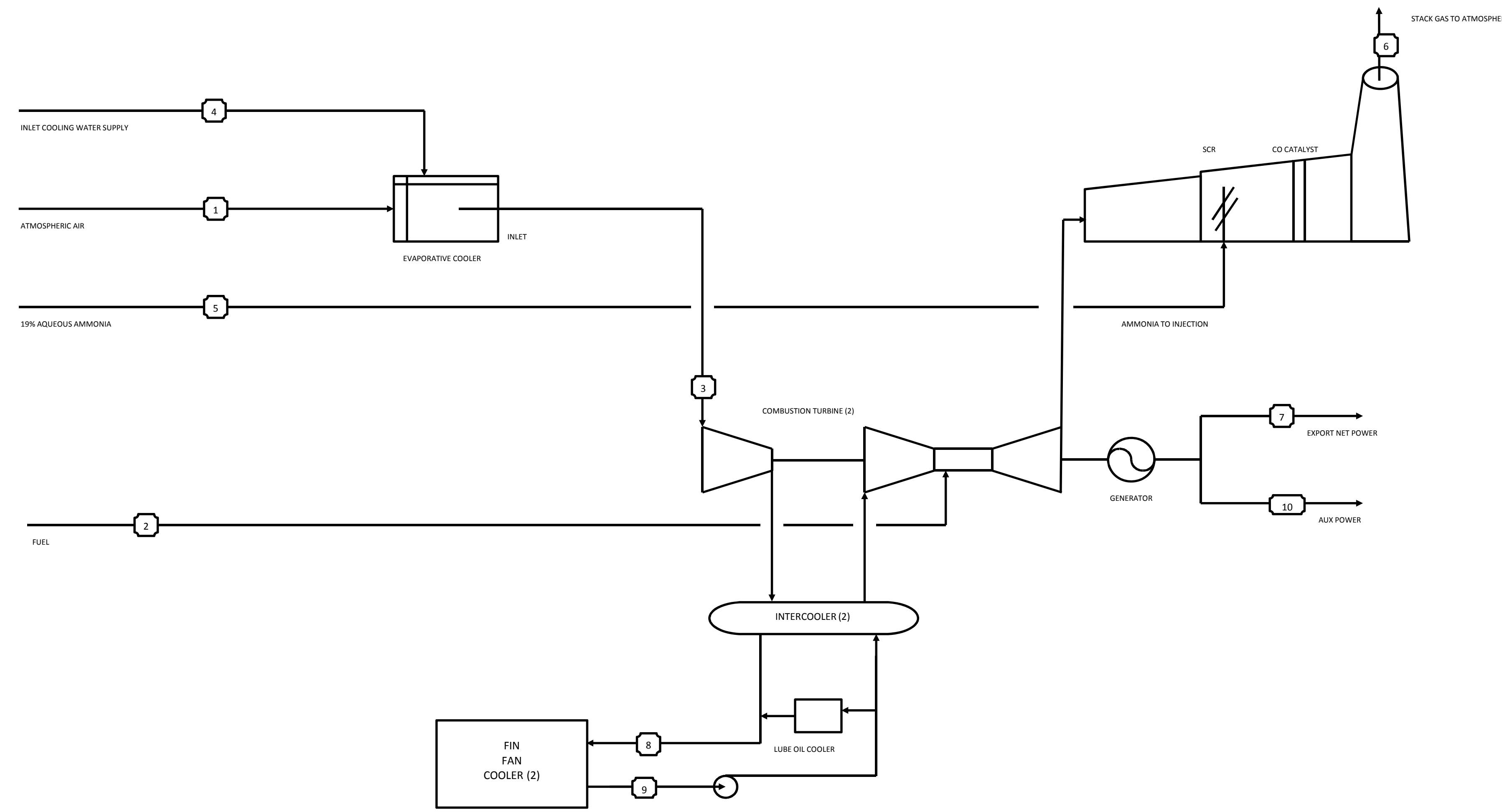
Suite 110
Brookfield, Wisconsin 53005

Heat and Mass Balance

AES HUNTINGTON BEACH
ENERGY PROJECT
HEAT AND MASS BALANCE
32F, 86.72% RH, NO EVAP

Rev: 0

Figures A60-1a
Heat and Mass Balance - 32F, 86.72% RH, NO EVAP
AES Amended Huntington Beach Energy Project
Huntington Beach, California



HEAT AND MATERIAL BALANCE FOR AMBIENT CONDITIONS											
		DATA REPRESENTS TWO COMBUSTION TURBINE GENERATORS									
	UNITS	1	2	3	4	5	6	7	8	9	10
FLOW	lb/hr	3371066	76052	3371066	-		3448000				
FLOW	gpm					0.8			13600	13600	
TEMPERATURE	dF	65.8	77	65.8	-	-	798		105.7	72.8	
LHV HEAT INPUT	mmBtu/hr		1572								
POWER	KW							189664			7990
NET LHV HEAT RATE	Btu/kwhr							8290			

REV	DATE	DESCRIPTION	DWN	DGN	CHK	APP
0	8/18/2015	FOR REVIEW	MH		JSC	DMP

B SIZE 11" X 17"

SCALE : NONE

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Heat and Mass Balance

AES HUNTINGTON BEACH
ENERGY PROJECT
HEAT AND MASS BALANCE
65.8F, 58.32%RH, NO EVAP

Rev: 0

Figures A60-1b

Heat and Mass Balance - 65.8F, 58.32%RH, NO EVAP

AES Amended Huntington Beach Energy Project

Huntington Beach, California

Visual Resources (61-74)

BACKGROUND

Under the amended HBEP, views of power block structures across Magnolia Marsh from key observation point 4 (KOP 4) would be larger and more dominant in the field of view compared to the same view under the licensed HBEP. The visual simulations for KOP 4 for the approved HBEP and the proposed amendment are shown in **Figure 5.13- 5** of the Petition to Amend. The sizes and massing of structures in the northeast portion of the site would be greater compared to the licensed project and clearly visible from KOP 4. The amended project's air cooled condenser (ACC) would be twice as long as the ACC unit for the approved HBEP (420 feet compared to 209 feet). The amended HBEP's ACC would also be a few feet taller and wider. A portion of one end of the simulated ACC unit is visible on the right side of image "B" in **Figure 5.13-5**. Most of the mass of the ACC unit is truncated in the simulation, and as a result, staff is unable to compare the amended HBEP to the licensed HBEP for views from KOP 4.

A portion of a wall inside the site perimeter is shown in the simulation for KOP 4 for the amended HBEP (behind the shorter perimeter wall in **Figure 5.13-5**, image "B"). The text description on page 5.13-7 in the Petition to Amend describes it as a "tall sound wall" on the site but provides no information on its dimensions or other details (e.g., height and design).

It states on page 5.13-2 of the Petition to Amend that the existing HBGS Units 1 and 2 would be removed to the top of the steam turbine deck, which would leave 30-foot-tall concrete structures in place in the footprint of those units. Although the concrete structures would be visible from KOP 4, they are not represented in the visual simulation for KOP 4.

DATA REQUESTS

A61. Staff requests a new KOP photograph and corresponding visual simulations for KOP 4. The revised KOP 4 photograph requires changing the view orientation to completely represent publicly visible power plant structures in the images for the licensed and amended HBEP. The revised photograph shall be used to produce new versions of **Figures 5.13-5**, **5.13-5A**, and **5.13-5B** from the **Visual Resources** section and visual appendix in the Petition to Amend.

If all visible power plant structures for the amended HBEP cannot fit into a single 50-mm frame for the revision of KOP 4, staff requests a wide angle of view be used to re-photograph the project site from that KOP. However, the existing view photograph and visual simulations must represent life-size scale when reproduced on 11 by 17-inch paper and held at a reading distance of approximately 12 inches or greater. The horizontal angle of view and lens setting must be provided for each image.

Staff requests the new KOP 4 simulation for the amended project include the 30- foot-tall concrete structures that would remain in the footprints of HBGS Units 1 and 2 and likely be visible to the right of the LMS100 stacks.

Response: Attached are revised Figures 5.13-5R-1a and 5.13-5R-1b which present the revised KOP-4 with a new base photograph. Also included is a new Figure 5.13-5R-1c showing the existing Huntington Beach Generating Station with the new base photograph.

A62. Staff requests further details on the tall sound wall, including dimensions, type of construction, and other descriptive details.

Response: The dimensions of the wall are provided in the response to Data Request A65. The further details on the sound wall construction will be determined during final design. The wall will be constructed of a paintable material and will include sound-absorbing material on the Project side of the wall.

BACKGROUND

In April 2014 during the original proceeding for the HBEP, the city of Huntington Beach (City) adopted Resolution No. 2014-18 supporting the applicant's conceptual architectural improvements and surface treatments for the project. The **Visual Resources** analysis for the licensed HBEP used the applicant's concept for architectural screening and enhancement to assess impacts on visual resources from the KOPs closest to the project site (KOPs 1, 4, and 5). The simulations showing the concepts for architectural screening are included in the FSA and the Commission Decision for the project. Refer to **Visual Resources Figures 4c**, **10**, and **12** in the Commission Decision (TN #203309). Refer also to pages 6.5-10, 6.5-15, and 6.5-17 in the Commission Decision describing use of the visual enhancement images to reach impact conclusions for these KOPs.

The amended HBEP would change the types, sizes, and massing of power plant structures on the site. These changes require the applicant to prepare a revised conceptual architectural screening plan for the project. The applicant presented some revised architectural enhancement concepts to City staff in July 2015. The City provided comments on the applicant's presentation and anticipates receiving refined conceptual plans based on those comments.

The applicant depicts simulated landscape plantings in the images contained in the Petition to Amend. The applicant's text descriptions of the simulations refer to the plantings (including palm trees and other shrubs and trees) that would visually screen power plant structures. This presents a problem for the visual analysis because no landscape plan beyond a 2-year-old conceptual plan currently exists. (See TN #201142 from November 2013, which includes the landscape concept.) The species that will ultimately be approved and their location, spacing, density, and mature heights are not yet determined. Also, staff considers landscape screening to be secondary to the project's permanent architectural enhancements. Landscape plantings that are ultimately approved as part of the project's on-site landscape and irrigation plan (Condition of Certification **VIS-2**) would soften and partially screen views of the project's permanent structures.

DATA REQUESTS

A63. Staff's analysis of the original HBEP used the applicant's architectural screening concept to reach impact conclusions for the KOPs closest to the project site. Staff requests images of the revised and refined architectural screening concept to allow completion of the comparative analysis of the amended HBEP to the licensed HBEP. Staff requests that the updated images for KOPs 1, 4, and 5 be used to produce new figures showing the conceptual architectural screening and surface treatments. The re-photographed image for KOP 4 is to be used as the basis for the architectural screening concept for that view.

Response: The Visual Resources analysis contained in the Commission's decision for the Licensed HBEP determined that the Project would not have significant impacts on the views seen from KOPs 1, 2, 3, 6, and 7. It found a potentially significant impact on the view from KOP 5, and a significant impact on the view from KOP 4. The analysis determined that the impacts on the views from both KOP 4 and KOP 5 would be reduced to a level that is less than significant with implementation of Conditions of Certification VIS-1 (architectural screening) and VIS-2 (landscaping).

PTA Figure 3.15-6 and the PTA analysis of the Project's visual effects on KOP 5 (PTA p. 5-13-9) demonstrate that the visual effect of the Amended HBEP on the view from KOP 5 would be considerably less than that of the Licensed HBEP and that there would be no potential for this effect to be significant. Because there is no potential for a significant impact on this view, there is no basis for requiring implementation of COCs VIS-1 and VIS-2 to make a finding that the level of impact would be less than significant.

Review of PTA Figure 3.15-5 and the PTA analysis of the Project's visual effects on KOP 4 (PTA pp. 5.13-8 and 5-13-9) document the fact that the overall visual impact of the Amended Project would be no greater than that of the Licensed Project. Because the Amended HBEP would not result in a visual impact on KOP 4 that would be greater than that of the Licensed HBEP, there is no need to revisit the Commission's finding that with implementation of COCs VIS-1 and VIS-2, the impacts on the view from KOP 4 can be reduced to a level that is less than significant. Project Owner is not contesting or seeking to revise existing Conditions VIS-1 or VIS-2 as part of the PTA for the Amended HBEP.[12]

Separate from the CEC PTA process, Project Owner has submitted architectural design concepts to the City of Huntington Beach for review. However, this consultation process is in its early stages, and City approval of the conceptual design has not yet been received. The conceptual architectural designs will be reviewed by the City's Design Review Board in January 2016, and subsequent review and approval of the designs will then be considered by the City Planning Commission and City Council. Because this consultation process with the City is separate from this licensing process and because the architectural concepts remain concepts at this time, it is not appropriate or feasible for the Project Owner to prepare and submit simulations of the views from KOPs 1, 4, and 5 that depict architectural treatment. It should be underscored that the provisions of VIS- 1, which the Project Owner does not contest, require a detailed architectural treatment plan and visual simulations of the project as it would appear with implementation of the plan to be submitted to Staff for review. At the time those plans and simulations are submitted and Staff conducts its review, Staff will have the opportunity to ensure that the visual impact of the project has been reduced to a level that it is less than significant. Regardless of the requirements of VIS-1, Project Owner agrees to provide Staff with any decisions made by the City in relation to the proposed architectural design upon receipt of the same, including any amendments to Resolution 2014-18 related thereto.

A64. Staff requests removal of the simulated landscape plantings from the images for KOPs 1, 4, and 5 showing the revised and refined architectural screening concept. This will allow staff, and ultimately other reviewers, to clearly see the effect of proposed architectural screening and surface treatments on the key views.

Response: See response to Data Response 63.

BACKGROUND

The Petition to Amend provides tables listing structure dimensions for the licensed and amended HBEP. **Tables 5.13-1** and **5.13-2** include dimensions for the licensed project's "Control/Administration Building" and "Maintenance/Warehouse Building." For the proposed GE Frame 7FA power block, **Table 5.13-1** lists an "Administration Building," "Control Building," and "Maintenance/Warehouse Building," each measuring 100 x 50 x 25 (feet). For the proposed LMS100s, **Table 5.13-2** lists an "Electrical Building," measuring 170 x 42 x 15 and a "Warehouse/Administration Building," measuring 270 x 138 x 17. The "Electrical Building" imaged in **Figures 2.1-3b** and **2.1-3c** appears near the GE Frame 7FA power block. An electrical building does not appear in the images near the LMS100 power block.

Section 2.0 in the Petition to Amend, Project Description, includes a series of figures with plant elevations (**Figures 2.1-3a** through **2.1-3d**). Those figures show one building identified both as the "Mechanical Building" and "Gas Compressor Building" for the GE Frame 7FA power block. The figures also show an *existing* 17-

[12] Project Owner acknowledges, however, that the reference to City Resolution No. 2014-18 in VIS-1 may require updating depending on any future City action on the matter.

foot-tall shop/warehouse/admin building. **Figure 2.1-3a** shows an *existing* 40-foot-tall "RO/EDI Building," and **Figure 2.1-3b** shows an *existing* 30-foot-tall "RO/EDI Building."

Tables 5.13-1 and **5.13-2** list heights of transmission structures for the licensed project. The corresponding dimensions for the amended project are incomplete.

The diameter of the exhaust stacks for the licensed project would have been approximately 18 feet. The diameters of the stacks for the amended project are not provided.

The quantities of structures for the licensed and amended projects are not provided.

It is not clear from the tables whether some structures are associated with one or the other power block and others are common to both.

The June 2012 AFC for the proposed HBEP includes **Figure 2.1-1**, "General Arrangement/Site Plan," which labels and lists project equipment. The Petition to Amend contains a similar site plan but without a list of project equipment (**Figure 2.1-2**).

DATA REQUESTS

Staff requires additional information on project structures and buildings to allow a comparison of the visual effects of the licensed HBEP to the proposed amended project. Staff requests corrections and additions to **Tables 5.13-1** and **5.13-2** and **Figures 2.1-2** through **2.1-3d** of the Petition to Amend:

A65. Please clarify whether the administration building, control building, and maintenance/warehouse building listed in **Table 5.13-1** are three separate structures that would serve the GE Frame 7FA power block, each measuring 100 x 50 x 25.

Response: Table 5.13-1 has been revised to reflect that the GE Frame 7FA power block will have a single Administration/Control/Warehouse building with dimensions measuring 124 x 50 x 28. Figures 2.1-1b and 2.1-1c, provided in response to Data Request A31, show the project features for each power block and include a legend that identifies the dimensions of each project feature.

TABLE 5.13-1
Dimensions of Licensed Power Block 1 and Amended Project GE Frame 7FA.05

	Licensed Project Power Block 1			Amended Project GE Frame 7FA.05		
Project Feature	**Length (feet)**	**Width/ Diameter (feet)**	**Height (feet)**	**Length (feet)**	**Width/Dia meter (feet)**	**Height (feet)**
Combustion Gas Turbine (CGT) (2)	89	32	34	40	18	30
CGT Generator Enclosure (2)	16	39	34	65	24	30
Steam Turbine Generator Enclosure (2)	59	55	40	NA	NA	NA
HRSG (2)	77	44	92	140	32	94
Stack (2)	—	18	120	—	20	150
CGT Air Intake System (2)	40	17	38	62	18	75
Fuel Gas Compressor Building	144	75	25	107	40	25
Air-cooled Condenser	209	127	104	420	128	110
Existing to Remain Reverse Osmosis/Electro-deionization Building				120	50	30
Control/Administration Building	100	72	40	See Administration/Control/Warehouse		

TABLE 5.13-1
Dimensions of Licensed Power Block 1 and Amended Project GE Frame 7FA.05

	Licensed Project Power Block 1			Amended Project GE Frame 7FA.05		
Project Feature	**Length (feet)**	**Width/ Diameter (feet)**	**Height (feet)**	**Length (feet)**	**Width/Dia meter (feet)**	**Height (feet)**
					Building Below	
Maintenance/Warehouse Building	72	60	35	See Administration/Control/Warehouse Building Below		
Administration/Control/Warehouse Building	See Control/Administration Building and Maintenance/Warehouse Building Lines Above			100	50	28
Service/Fire Water Tank					52	40 or 45
Demineralized Water Tank					33	30 or 33
Eastern Sound Wall				848	2.5	50
Western Sound Wall				170	2.5	50
Transformer Wall	53	42	30			
Transmission Structure	—	—	85–135	—	—	
Transmission Dead-End Structure	—	—	75	—	—	

A66. Please indicate quantities of buildings and structures associated with each power block for the licensed and amended projects. Please indicate which ones are common.

Response: Please see revised Table 5.13-1 and Figures 2.1-1b and 2.1-1c. In cases where there is more than one of any feature, a number in parentheses indicates how many there are that are associated with the power block in whose list it appears. All project features have been listed in either Table 5.13-1 and Figures 2.1-1b and 2.1-1c, and no features have been listed separately as common both power blocks.

A67. Please indicate HBGS buildings listed in the two tables that would be retained and used for the proposed amended project. Based on **Figures 2.1-3a** through **2.1-3d**, this includes the 17-foot-tall "Existing Shop/Warehouse/Admin Building" and the 40-foot-tall "Existing RO/EDI Building." (Please also state what RO/EDI means.) Please add the RO/EDI building to the table(s).

Response: The existing RO/EDI (reverse osmosis/electrodeionization) Building would be retained and used as an element of the GE Frame 7FA.05 project and is listed in Table 5.13-1. The existing shop/warehouse/administration building would be retained and used as an element of the Project LMS-100.

A68. Please correct the tables as necessary to eliminate possible double listing of buildings that serve more than one purpose For example, the GE Frame 7FA mechanical building and gas compressor building appear as one building based on the images and structure labels shown in the Section 2.0, Project Description figures.

Response: Table 5.13-1 has been revised to eliminate double listing of buildings.

A69. Please make corrections as necessary to **Figures 2.1-3a** through **2.1-3d**. For example, **Figure 2.1-3a** shows the "Existing "RO/EDI Building" as 40 feet tall; **Figure 2.1-3b** shows it as 30 feet tall.

Response: Figures 2.1-3a through 2.1-3d have been revised to ensure consistency.

A70. Please add the 40-foot-tall and 30-foot tall water tanks to the tables and include tank diameters.

Response: The water tanks and their dimensions have been added to Table 5.13-1.

A71. Please add the "tall sound wall" to the table.

Response: The sound wall and its dimensions have been added to Table 5.13-1.

A72. Please add the diameters for the exhaust stacks to the tables.

Response: The dimensions of the exhaust stacks have been added to Figures 2.1-1b and 2.1-1c.

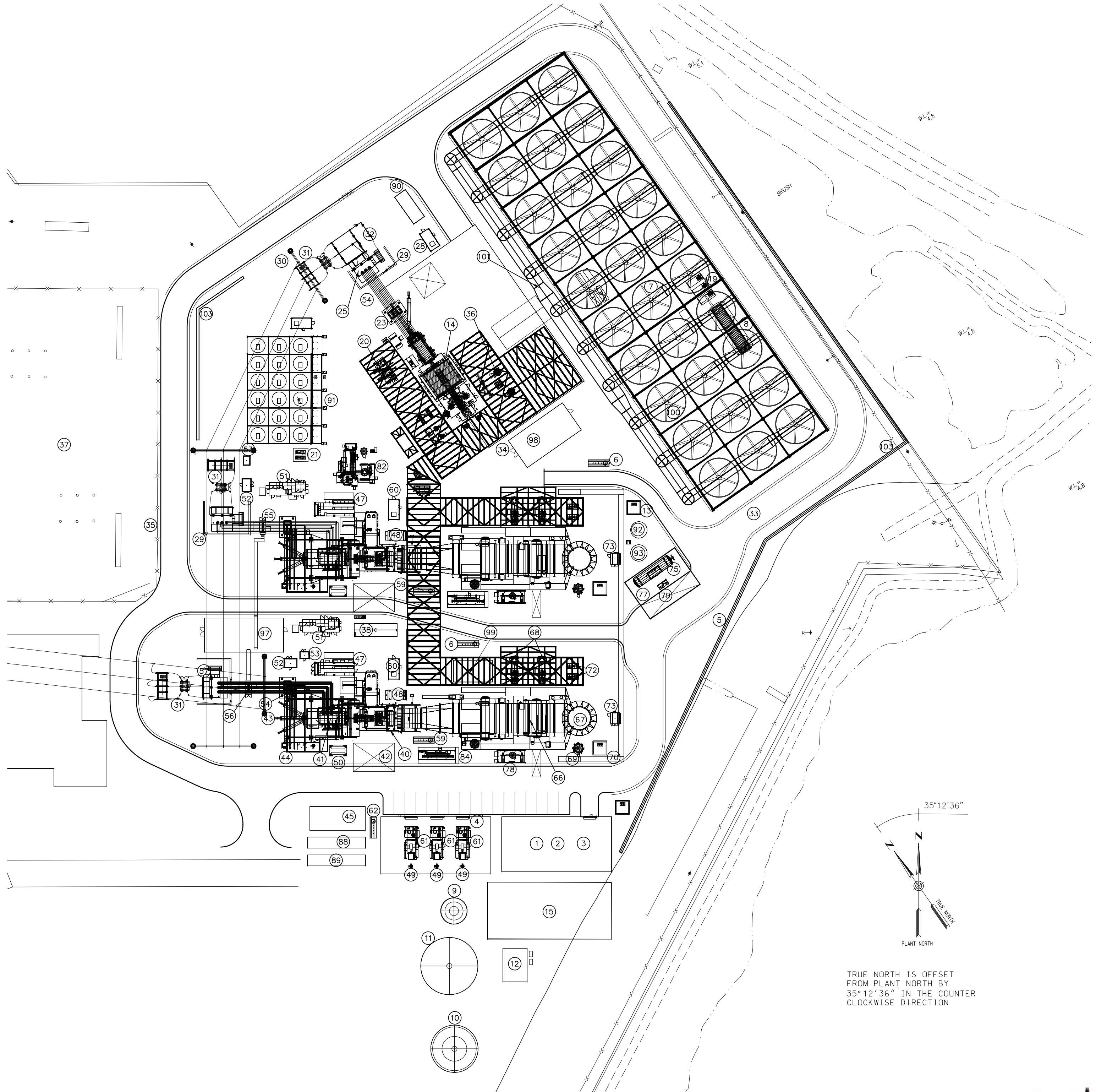
A73. Please add dimensions and quantities for the proposed transmission structures to the tables.

Response: The dimensions and quantities of the proposed transmission structures have been added to Table 5.13-1 and Figures 2.1-1b and 2.1-1c.

A74. Please add the equipment list and corresponding numbers to **Figure 2.1-2**, including the sound wall and the "transformer wall" listed in **Tables 5.13-1** and **5.13-2**. Please add the HBGS Units 1 and 2 concrete structures to **Figure 2.1-2**.

Response: See Figures 2.1-1b and 2.1-1c.

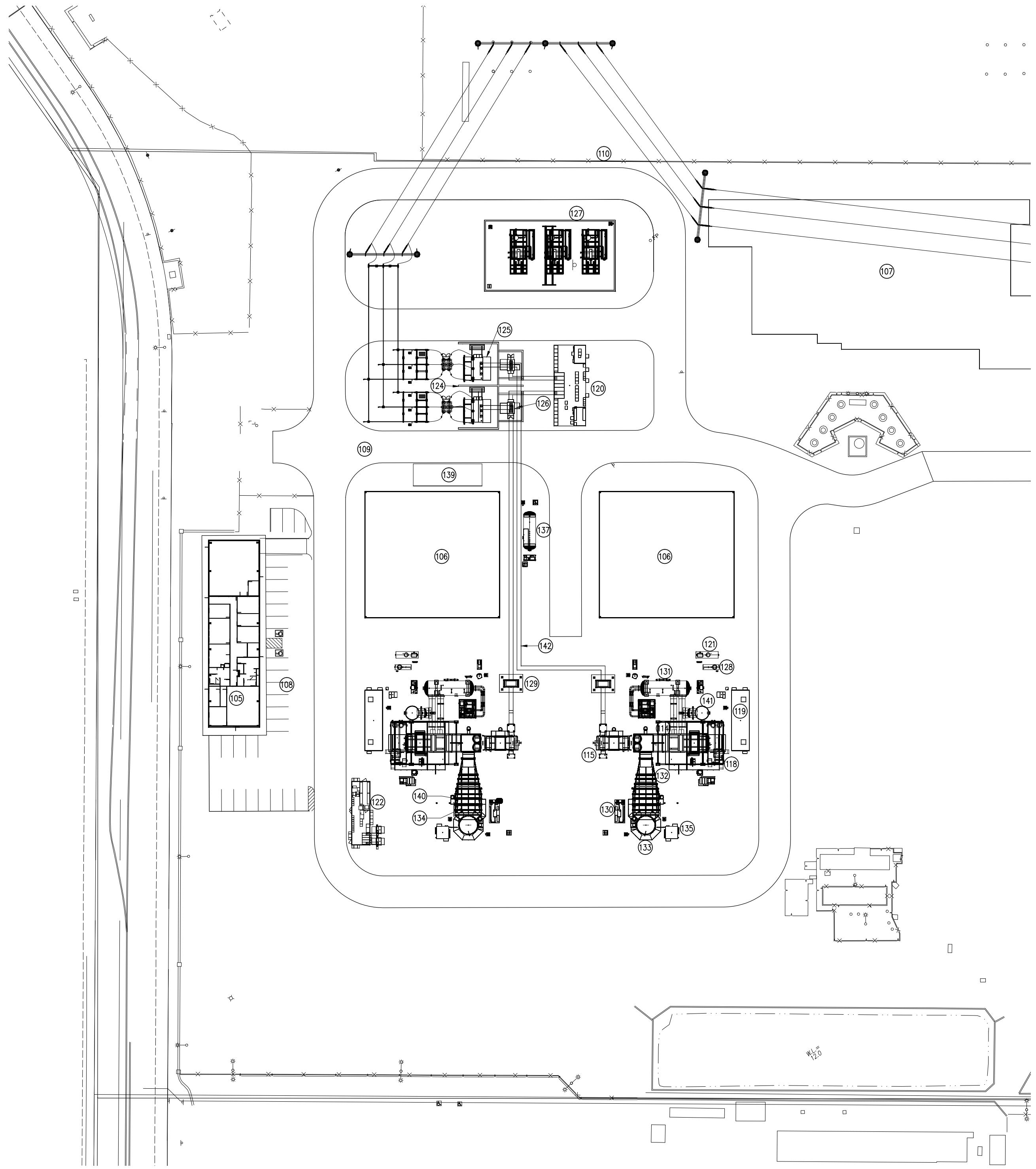
2X1 7FA LEGEND	
NO.	DESCRIPTION
1	ADMINISTRATION BUILDING
2	CONTROL BUILDING
3	WAREHOUSE BUILDING
4	GAS COMPRESSOR BUILDING
5	SOUND WALL
6	OIL/WATER SEPARATOR
7	AIR COOLED CONDENSER
8	AIR COOLED CONDENSER/CONDENSTATE TANK
9	RECYCLE WATER TANK
10	DEMIN WATER STORAGE TANK
11	SERVICE/FIRE WATER TANK
12	FIRE PUMP ENCLOSURE
13	WASTE WATER COLLECTION SUMP
14	STEAM TURBINE AND GENERATOR
15	EXISTING RO/EDI BUILDING (REUSE)
16	
17	
18	
19	CONDENSATE PUMPS
20	STG LUBE OIL MODULE
21	CLOSED COOLING WATER PUMPS
22	
23	STG EXCITATION UNIT EQUIPMENT (GEC)
24	
25	STG STEP-UP TRANSFORMER
26	
27	
28	FIRE PROTECTION VALVE HOUSE
29	TRANSFORMER FIREWALL
30	DEADEND STRUCTURE
31	POTHEND STRUCTURE
32	CONTAINMENT CURB
33	ROADWAY
34	PIPE RACK
35	SITE FENCE
36	HP STEAM DRAINS TANK
37	PLANT SWITCHYARD
38	CHEMICAL FEED CANOPY
39	
40	COMBUSTION TURBINE
41	COMBUSTION TURBINE GENERATOR
42	TURBINE ROTOR REMOVAL AREA
43	GENERATOR REMOVAL AREA
44	AIR INLET FILTER
45	HYDROGEN STORAGE
46	
47	PEECC
48	FIRE PROTECTION CO2 SKID
49	FUEL GAS FILTER/SEPERATOR
50	FUEL GAS STARTUP HEATER
51	UNIT EXCITATION/LCI EQUIPMENT
52	ISOLATION TRANSFORMER
53	EXCITATION TRANSFORMER
54	GENERATOR BREAKER
55	ISO PHASE BUS DUCT
56	UNIT AUXILIARY TRANSFORMER
57	CTG STEP-UP TRANSFORMER
58	
59	WATER WASH DRAINS TANK
60	WATER WASH SKID
61	FUEL GAS COMPRESSORS
62	FUEL GAS COMPRESSOR DRAINS TANK
63	
64	
65	
66	HRSG
67	STACK
68	BOILER FEEDWATER PUMPS
69	BLOWDOWN TANK
70	BLOWDOWN TANK DRAIN SUMP
71	
72	HRSG FEEDWATER PREHEATER PUMPS
73	CONTINUOUS EMISSIONS MONITORING SYSTEMS BUILDING (CEMS)
74	
75	AMMONIA STORAGE TANK
76	
77	AMMONIA CONTAINMENT AREA
78	AMMONIA INJECTION SKID
79	AMMONIA UNLOADING CONTAINMENT AREA
80	
81	
82	AUXILIARY BOILER AND ASSOCIATED EQUIPMENT
83	
84	IP WATER FUEL GAS HEATER
85	
86	
87	
88	CO2 STORAGE TANK
89	NITROGEN STORAGE
90	STG FIRE WATER COLLECTION TANK
91	AIR COOLED HEAT EXCHANGER
92	WASTE WATER TANK
93	CONDENSATE STORAGE TANK
94	
95	
96	
97	MEDIUM VOLTAGE ELECTRICAL ENCLOSURE
98	STG ELECTRICAL ENCLOSURE
99	HRSG ELECTRICAL ENCLOSURE
100	ACC ELECTRICAL ENCLOSURE
101	ACC DUCT
102	
103	ACOUSTICAL BARRIER



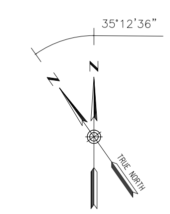
KEYPLAN

Figure 2.1-2b
General Arrangement/Site Plan
AES Amended Huntington Beach Energy Project
Huntington Beach, California

ch2m



LMS 100 LEGEND	
NO.	DESCRIPTION
104	
105	ELECTRICAL BUILDING
106	FIN FAN COOLER
107	EXISTING SHOP/ WAREHOUSE/ ADMIN BUILDING
108	PARKING AREA
109	ROADWAY
110	SITE FENCE
111	
112	
113	
114	COMBUSTION TURBINE
115	COMBUSTION TURBINE GENERATOR
116	
117	
118	AIR INLET FILTER
119	PACKAGED ELECTRICAL ELECTRONIC CONTROL CENTER (PEECC)
120	ELECTRICAL ENCLOSURE
121	FUEL GAS HEATER
122	LOW VOLTAGE ENCLOSURE
123	
124	TRANSFORMER FIREWALL
125	CTG STEP-UP TRANSFORMER
126	UNIT AUXILIARY TRANSFORMER
127	GAS COMPRESSOR BUILDING
128	FUEL GAS REGULATOR
129	GENERATOR BREAKER
130	
131	INTERCOOLER SKID
132	CTG EXHAUST DUCT
133	STACK
134	SCR
135	CONTINUOUS EMISSIONS MONITORING SYS. EQUIP.
136	
137	AMMONIA STORAGE TANK
138	
139	AMMONIA UNLOADING CONTAINMENT AREA
140	CO CATALYST
141	COMBUSTION TURBINE VBV SILENCER STACK
142	NON-SEG BUS



TRUE NORTH IS OFFSET
FROM PLANT NORTH BY
35°12'36" IN THE COUNTER
CLOCKWISE DIRECTION

KEYPLAN

Figure 2.1-2c
General Arrangement/Site Plan
AES Amended Huntington Beach Energy Project
Huntington Beach, California

ch2m

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A. Simulated view toward project site from Magnolia Street of the Licensed HBEP Project from Magnolia Street.

B. Simulated view toward project site from Magnolia Street with the Amended HBEP in place.

Figure 5.13-5 R1
KOP 4 - View Toward HBEP from Magnolia Street
AES Amended Huntington Beach Energy Project
Huntington Beach, California

C. Existing view of Huntington Beach Energy Project

Figure 5.13-5 R1
KOP 4 - View Toward HBEP from Magnolia Street
AES Amended Huntington Beach Energy Project
Huntington Beach, California