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Document Title:	AES HBEP 1-Hour N02 Competing Source Inventory 10-18-13
Description:	N/A
Filer:	Tiffani Winter
Organization:	AES Huntington Beach, LLC.
Submitter Role:	Applicant
Submission Date:	10/18/2013 2:29:15 PM
Docketed Date:	10/18/2013

From: Jerry.Salamy@CH2M.com [mailto:Jerry.Salamy@CH2M.com]
Sent: Friday, October 18, 2013 9:52 AM
To: jbaker@aqmd.gov
Cc: ctupac@aqmd.gov; MNazemi1@aqmd.gov; tchico@aqmd.gov; JYee@aqmd.gov; stephen.okane@AES.com; Bemis, Gerry@Energy; Miller, Felicia@Energy; Robert.Mason@CH2M.com; CPerri@aqmd.gov; Elyse.Engel@ch2m.com
Subject: RE: AES Huntington Beach Energy Project 1-Hour NO2 Competing Source Inventory

Hi Jillian,

Attached is the HBEP PSD modeling assessment which includes a presentation of the HBEP impacts compared to state and federal ambient air quality standards, demonstration of project impacts compared to applicable PSD significant impact levels and ambient monitoring requirements, a 1-hour NO2 competing source analysis, and a Class II visibility impact assessment. Also included is a demonstration of HBEP's compliance with Rule 1401. A hard copy of the attached assessment, including two CDs with the modeling files, is being sent overnight to your attention.

Please let me know if you have any questions.

Thanks,

Jerry Salamy
Principal Project Manager
CH2M HILL/Sacramento
Phone 916-286-0207
Fax 916-614-3407
Cell Phone 916-769-8919

From: Jillian Baker [mailto:jbaker@aqmd.gov]
Sent: Tuesday, October 08, 2013 4:29 PM
To: Salamy, Jerry/SAC
Cc: Charles Tupac; Mohsen Nazemi; Tom Chico; John Yee; stephen.okane@AES.com; Gbemis@energy.state.ca.us; Felicia.Miller@energy.ca.gov; Mason, Robert/SCO; Chris Perri; Engel, Elyse/SJC
Subject: RE: AES Huntington Beach Energy Project 1-Hour NO2 Competing Source Inventory

Hi Jerry,

I have reviewed the files you sent and the inputs in the AERMOD file are consistent with the parameters which we have provided to you.

As for the MPRM processed meteorological data which you will be using in the visibility analysis, we are unable to perform a thorough review since we do not have the accompanying write-up which describes what was done in detail.

Please proceed with the air quality analyses for this project. Once we have received your reports, we will provide you with any additional comments we might have after that review.

Jillian Baker, Ph.D.
South Coast AQMD
21865 Copley Drive,

Diamond Bar, CA 91765
Direct: 909.396.3176

From: Jerry.Salamy@CH2M.com [mailto:Jerry.Salamy@CH2M.com]
Sent: Thursday, October 03, 2013 2:13 PM
To: Jillian Baker
Cc: Charles Tupac; Mohsen Nazemi; Tom Chico; John Yee; stephen.okane@AES.com; Gbemis@energy.state.ca.us; Felicia.Miller@energy.ca.gov; Robert.Mason@CH2M.com; Chris Perri; Elyse.Engel@ch2m.com
Subject: AES Huntington Beach Energy Project 1-Hour NO2 Competing Source Inventory

Hi Jillian,

Per your direction, attached is the Huntington Beach Energy Project's 1-hour competing source AERMOD input file for your review and approval.

Per your request, we have processed the meteorological data used for the AERMOD dispersion modeling to allow the development of joint frequency wind tables required for the VISCREEN Tier 2 analysis. Attached is the processed MPRM meteorological data for use in the HBEP Class II VISCREEN Tier 2 analysis.

Your review and approval of these files will be greatly appreciated.

Thanks,

Jerry Salamy
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October 18, 2013

Mr. Mohsen Nazemi, P.E.
Deputy Executive Officer
South Coast Air Quality Management District
21865 Copley Drive
Diamond Bar, CA 91765-4178

Subject: Huntington Beach Energy Project Permit Application (Facility ID# 115389)

Dear Mr. Nazemi:

AES Huntington Beach, LLC (AES) is submitting this letter in response to the South Coast Air Quality Management District's (SCAQMD) October 8, 2013 e-mail approving the methodology for performing the cumulative 1-hour nitrogen dioxide (NO_2) national ambient air quality impact assessment and the Class II visibility impact area analysis for the Huntington Beach Energy Project (HBEP). This letter presents AES's air quality impact assessment and incorporates comments received from the SCAQMD. This letter also addresses the SCAQMD's October 9, 2013 request for demonstration of compliance with SCAQMD Rule 1401.

1) Cumulative 1-hour NO_2 National Ambient Air Quality Impact Assessment

Response: Table SCAQMD-1 presents a comparison of the maximum HBEP operational impacts to the California and National Ambient Air Quality Standards (CAAQS and NAAQS, respectively). The NO_2, carbon monoxide (CO), sulfur dioxide (SO_2), and particulate matter with an aerodynamic diameter less than or equal to 2.5 microns ($PM_{2.5}$) concentrations combined with the background concentrations do not exceed either the CAAQS or NAAQS. Therefore, HBEP will not cause or contribute to the violation of a standard, and the NO_2, CO, SO_2, and $PM_{2.5}$ impacts from operation will be less than significant.

For particulate matter with an aerodynamic diameter less than or equal to 10 microns (PM_{10}), modeled HBEP PM_{10} concentrations combined with the background concentrations do not exceed the NAAQS and will not cause or contribute to the violation of the NAAQS. However, the background concentrations exceed the 24-hour and annual CAAQS without the proposed project. As a result, the predicted project impacts plus background exceed the CAAQS and the operation of the proposed project would further contribute to an existing violation of the CAAQS absent mitigation. As discussed in Application for Certification (AFC) Section 5.1.8.2, which was submitted to the California Energy Commission (CEC) in June

2012, HBEP emissions will be fully offset consistent with SCAQMD Rules 1303, 1304, and 1304.1 using the SCAQMD internal offset bank. Therefore, the PM_{10} impacts from operation will be mitigated to a less-than-significant level.

A summary of the dispersion modeling input files for this analysis, as well as the modeling parameters used, are presented in Attachment 1. The AERMOD input and output files have been separately prepared and are included with this submission on compact disc.

TABLE SCAQMD-1
HBEP Operation Impacts Analysis—Maximum Modeled Impacts Compared to the Ambient Air Quality Standards

Pollutant	Averaging Time	Maximum Modeled Concentration ($\mu g/m^3$)	Background Concentration ($\mu g/m^3$) [a]	Total Predicted Concentration ($\mu g/m^3$)	CAAQS ($\mu g/m^3$)	NAAQS ($\mu g/m^3$)
NO_2 [b]	1-hour	58.6	152	211	339	—
	Federal 1-hour [c]	58.6	100	159	—	188
	Annual	0.40	24.8	25.2	57	100
SO_2	1-hour	4.95	26.2	31.2	655	—
	Federal 1-hour [d]	4.95	20.9	25.9	—	196
	3-hour	3.70	17.3	21.0	—	1,300
	24-hour	1.22	10.5	11.7	105	365
CO	1-hour	328	3,436	3,764	23,000	40,000
	8-hour	78.4	2,519	2,597	10,000	10,000
PM_{10}	24-hour	4.72	56.0	60.7	50	150
	Annual	0.27	23.5	23.8	20	—
$PM_{2.5}$	24-hour [c]	4.72	28.8	33.52	—	35
	Annual	0.27	10.4	10.7	12	12

[a] Background concentrations were the highest concentrations monitored during 2008 through 2012, with the exception of the 3-hour SO_2 averaging period, which was taken as the highest concentrations monitored during 2008 through 2010.
[b] The maximum 1-hour and annual NO_2 concentrations include ambient NO_2 ratios of 0.80 (U.S. Environmental Protection Agency [EPA], 2011) and 0.75 (EPA, 2005), respectively.
[c] Total predicted concentrations for the Federal 1-hour NO_2 standard and 24-hour $PM_{2.5}$ standard are the respective maximum modeled concentrations combined with the 3-year average of 98th percentile background concentrations.
[d] Total predicted concentrations for the Federal 1-hour SO_2 standard is the maximum modeled concentration combined with the 3-year average of 99th percentile background concentrations.

$\mu g/m^3$ = micrograms per cubic meter

Table SCAQMD-2 presents a summary of the predicted hourly and annual NO_2 and 24-hour and annual PM_{10} impacts from HBEP operation, as well as a comparison to the Class II Significant Impact Levels (SILs), Class II Prevention of Significant Deterioration (PSD) Increment Standards, and the significant monitoring concentration levels. The dispersion modeling was performed consistent with the HBEP dispersion modeling protocol and addendum, with the SCAQMD's comments of August 9, 2013 incorporated. As shown, the maximum predicted annual NO_2, 24-hour PM_{10}, and annual PM_{10} impacts from HBEP operation are below the Class II SILs, PSD Class II Increment Standards, and significant monitoring concentrations. Therefore, additional analysis of 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 HBEP operation exceed the Class II SIL, with a radius of impact with predicted concentrations greater than 7.52 micrograms per cubic meter ($\mu g/m^3$) of

2.7 kilometers (km). Therefore, the cumulative impacts of the HBEP and competing sources were assessed for all receptors where HBEP impacts alone exceeded the 1-hour NO_2 SIL.

TABLE SCAQMD-2
HBEP Predicted Impacts Compared to the PSD Air Quality Impact Standards

Averaging Period/ Pollutant	Maximum Predicted Impact ($\mu g/m^3$) [a]	Significant Impact Level ($\mu g/m^3$)	PSD Class II Increment Standard ($\mu g/m^3$)	Significant Monitoring Concentration ($\mu g/m^3$)
NO_2 (1-hour)	58.6	7.52 [b]	N/A	N/A
NO_2 (Annual)	0.40	1.0	25	14
PM_{10} (24-hour)	4.72	5.0	30	10
PM_{10} (Annual)	0.27	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 SIL for 1-hour NO_2 is based on SCAQMD correspondence.

N/A = Not Applicable (i.e., no standard)

The SCAQMD identified three facilities within 10 km of HBEP for inclusion in the cumulative impact assessment:

- Orange County Sanitation District (Facility ID 29110): located in Huntington Beach, California with seven emission sources
- Orange County Sanitation District (Facility ID 17301): located in Fountain Valley, California with five emission sources
- Beta Offshore (Facility ID 166903): located in Huntington Beach, California with 21 emission sources

The stack locations, stack parameters, and 1-hour NO_2 emission rates for the emission sources at these three facilities were provided by the SCAQMD[1]. Attachment 2 includes copies of the SCAQMD correspondence. Per the SCAQMD's request, the Beta Offshore emission sources were modeled as rural sources.

In addition to the above facilities, the SCAQMD also requested that emissions from shipping lane activity off the California coast be included in the cumulative impact assessment. The SCAQMD provided the relevant locations, source parameters, and 1-hour NO_2 emission rates for the shipping lane activity; Attachment 3 includes a copy of the SCAQMD correspondence. Per the SCAQMD's request, the shipping lane emission sources were modeled as rural sources.

Emission rates and stack parameters for the existing Huntington Beach Generating Station's Units 1 and 2 boilers, also requested for inclusion as a competing source by SCAQMD, were based on permitted oxides of nitrogen (NOx) concentrations and the most recently available stack test data, respectively. The inclusion

[1] SCAQMD staff provided information for Orange County Sanitation District (Facility ID 29110) and Orange County Sanitation District (Facility ID 17301) via e-mail on September 5, 2013 and information for Beta Offshore (Facility ID 166903) via e-mail on October 1, 2013.

of existing Huntington Beach Generating Station's Units 1 and 2 boilers is highly conservative since these units will be retired after HBEP Block 2 commences commercial operation. Furthermore, the HBEP electrical interconnection at the Southern California Edison switchyard is limited to a maximum of 939 megawatts, which would be exceeded by operation of the HBEP (939 megawatts) and the Huntington Beach Generating Station's Units 1 and 2 boilers (430 megawatts).

The cumulative impacts of the HBEP and competing sources were assessed for all receptors where HBEP impacts alone exceeded the 1-hour NO_2 SIL. Table SCAQMD-3 presents a summary of the maximum predicted cumulative 1-hour NO_2 impacts from HBEP operation and competing sources as well as a comparison to the NAAQS. As shown in Table SCAQMD-3, the predicted HBEP cumulative impacts, including a representative background NO_2 concentration, are below the NAAQS.

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

Pollutant	Averaging Time	Total Predicted Concentration (µg/m^3) [a]	Federal Standard (µg/m^3)
NO_2	1-hour	167	188

[a] Total predicted concentration for the Federal 1-hour NO_2 standard is the maximum modeled concentration paired with the 3-year average of 98th percentile seasonal hour-of-day background concentrations, as provided by the SCAQMD.

The federal 1-hour NO_2 impacts presented in Tables SCAQMD-1 and SCAQMD-3 cannot be directly compared primarily due to the different methods used to derive the applicable background concentrations (in addition to the receptor domains and the emission sources). In the case of Table SCAQMD-1, the background concentration used represents the 3-year average of 98th percentile background concentrations. Use of the 3-year average of 98th percentile background concentrations assumes this value occurs every hour of the year, which is not consistent with monitoring data. The SCAQMD provided representative 3-year average of the 98th percentile seasonal hour-of-day background concentrations for use in this analysis. These seasonal hour-of-day background NO_2 concentrations are based on actual monitoring data, resulting in the more refined NO_2 impact assessment presented in Table SCAQMD-3.

A summary of the dispersion modeling input files for this analysis, as well as the modeling parameters used, are presented in Attachment 4. The AERMOD input and output files have been separately prepared and are included with this submission on compact disc.

References

U.S. Environmental Protection Agency (EPA). 2005. *Guideline on Air Quality Models*, 40 Code of Federal Regulations 51, Appendix W. November.

U.S. Environmental Protection Agency (EPA). 2011. *Additional Clarification Regarding Application of Appendix W Modeling Guidance for the 1-Hour NO_2 National Ambient Air Quality Standard*. EPA Office of Air Quality Planning and Standards. March 1.

2) Revised Class II Visibility Impact Area Analysis

Response: As requested, a visibility analysis for Class II areas within 50 km of HBEP was performed using the VISCREEN plume modeling program per the procedures outlined in the *Workbook for Plume Visual Impact Screening and Analysis* (EPA, 1992), as further described in Attachment 5. Please note that the VISCREEN Tier I and II assessments were conducted using criteria 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 demonstrates that HBEP would not adversely affect visibility at nearby Class II Areas.

Table SCAQMD-4 summarizes the VISCREEN Tier I modeled results for each Class II area evaluated.[2] 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 SCAQMD-4
HBEP Tier I VISCREEN Results

Class II Area	Minimum Distance	Maximum Distance	Variable	Sky	Terrain	Criteria [a]
Crystal Cove State Park	12.5	18.4	Color Difference	**3.961**	**7.476**	2.0
			Contrast	-0.041	0.042	|0.05|
Water Canyon State Park	33.6	42.9	Color Difference	1.732	**2.326**	2.0
			Contrast	-0.018	0.021	|0.05|
Chino Hills State Park	35.8	41.6	Color Difference	1.437	1.612	2.0
			Contrast	-0.015	0.017	|0.05|
San Mateo Canyon Wilderness Area	44.3	57.6	Color Difference	1.083	1.564	2.0
			Contrast	0.011	0.015	|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 SCAQMD-4, the results of the Tier I assessment demonstrate that the proposed HBEP would be below the significance criterion for both color difference and contrast at Chino Hills State Park and San Mateo Wilderness Area. The Tier I assessment did, however, exceed the criterion for color difference at Crystal Cove State Park and Water Canyon State Park. As a result, a Tier II assessment was performed for the Crystal Cove State Park and Water Canyon State Park. The Tier II assessment utilized the John Wayne Airport AERMET meteorological dataset for years 2008 through 2012, to determine representative worst-case single combinations of wind speed, wind direction, and atmospheric stability for each Class II area above the screening criteria. The Tier II assessment results are summarized in Table SCAQMD-5.

[2] SCAQMD staff approved the Class II areas for evaluation via e-mail on June 20, 2013.

TABLE SCAQMD-5
HBEP Tier II VISCREEN Results

Class II Area	Minimum Distance	Maximum Distance	Wind Speed [a]	Stability [a]	Variable	Sky	Terrain	Criteria [b]
Crystal Cove State Park	12.5	18.4	4	D	Color Difference	0.319	0.687	2.0
					Contrast	0.003	0.004	|0.05|
Water Canyon State Park	33.6	42.9	3	F	Color Difference	0.586	0.797	2.0
					Contrast	0.006	0.007	|0.05|

[a] The Joint Frequency Distribution table used to calculate the wind speed and stability for the Tier II assessment is presented in Attachment 5.
[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).

The HBEP VISCREEN Tier II assessment for Crystal Cove State Park and Water Canyon State Park did not exceed the criterion for color difference or contrast. As the modeled results are below the conservative Class I area criterion for both color difference and contrast, HBEP would not adversely affect visibility at these or other nearby Class II areas. The VISCREEN input and output files, as well as the meteorological data used in this analysis, have been separately prepared and are included with this submission on compact disc.

References

Federal Land Managers (FLM). 2010. *Federal Land Managers' Air Quality Related Values Workgroup (FLAG) Phase I Report – Revised (2010)*. October.

U.S. Environmental Protection Agency (EPA). 1992. *Workbook for Plume Visual Impact Screening and Analysis* (EPA-454/R-92-023). October.

3) SCAQMD Rule 1401 Compliance

Response: As requested, a summary of the maximum individual cancer risk (MICR), chronic health index, and acute health index at the point of maximum impact (PMI) locations, as well as the maximum predicted public health impacts for worker, residential, and sensitive receptors, has been included in Table SCAQMD-6. In accordance with SCAQMD Rule 1401, the results in Table SCAQMD-6 represent the predicted risk for each individual emission unit. The operational health risk assessment modeling followed the methodology outlined in AFC Section 5.9.3.1, which was submitted to the CEC in June 2012, and includes the use of the U.S. Environmental Protection Agency's (EPA) AP-42 emission factors and the SCAQMD-recommended formaldehyde emission factor. The HARP report files have been separately prepared and are included with this submission on compact disc.

As presented in Table SCAQMD-6, the MICR at the PMI for an individual turbine is predicted to be 0.61 in 1 million. The MICR for the Maximally Exposed Individual Resident (MEIR) is predicted to be 0.43 in 1 million (Derived Adjusted) for an individual unit, and the MICR for the Maximally Exposed Individual Worker

(MEIW) is predicted to be 0.107 in 1 million for an individual unit. The MICR at the maximally exposed sensitive receptor is predicted to be 0.31 in 1 million for an individual unit. Overall, the predicted MICR for the MEIR, MEIW, and the maximally exposed sensitive receptor are well below the individual source significance threshold of 1 in 1 million. Therefore, based on SCAQMD Rule 1401, the predicted incremental increase in cancer risk from each individual unit will be less than significant, and best available control technology for toxic organic compounds (T-BACT) would not be required. However, while not required, the emission control technologies included in this project are considered to be T-BACT.

The maximum chronic health index for an individual unit at the PMI is predicted to be 0.00187. The maximum acute health index for an individual unit at the PMI is predicted to be 0.033. The predicted chronic and acute health indices are well below the SCAQMD individual source significance threshold of 1.0. Therefore, the predicted impact from each individual unit will be less than significant, and T-BACT will not be required. However, as previously noted, the emission control technologies included in this project are considered to be T-BACT.

TABLE SCAQMD-6
Operation: Health Risk Assessment Summary – Individual Units

Risk	Turbine 1	Turbine 2	Turbine 3	Turbine 4	Turbine 5	Turbine 6
Cancer Risk at the PMI [a] (per million)	0.49	0.49	0.61	0.49	0.49	0.50
Cancer Risk at the PMI [b] (per million)	0.48	0.48	0.59	0.48	0.48	0.49
Cancer Risk at the MEIR [b] (per million)	0.39	0.36	0.34	0.43	0.43	0.43
Highest Cancer Risk at a Sensitive Receptor [b] (per million)	0.30	0.30	0.31	0.23	0.24	0.26
Cancer Risk at the MEIW (per million)	0.086	0.086	0.107	0.087	0.087	0.088
Chronic Hazard Index at the PMI	0.0015	0.00151	0.00187	0.00151	0.00151	0.00153
Resident Chronic Hazard Index	0.00123	0.00113	0.00107	0.00136	0.00136	0.00136
Worker Chronic Hazard Index	0.0015	0.00151	0.00187	0.00151	0.00151	0.00153
Chronic Hazard Index at a Sensitive Receptor	0.000954	0.000952	0.000975	0.000726	0.000767	0.000818
Acute Hazard Index at the PMI	0.0277	0.033	0.0226	0.00414	0.0104	0.0127
Resident Acute Hazard Index	0.0149	0.0189	0.0106	0.00296	0.00502	0.00669
Worker Acute Hazard Index	0.0277	0.033	0.0226	0.00414	0.01040	0.0127
Acute Hazard Index at a Sensitive Receptor	0.00338	0.00369	0.00415	0.00255	0.00236	0.00255

[a] Cancer risk values represent the Office of Environmental Health Hazard Assessment (OEHHA) Derived Methodology.
[b] Risk values represent the Derived Adjusted Methodology.

If you require further information, please don't hesitate contacting me at 562-493-7840.

Sincerely,

Stephen O'Kane
Manager
AES Huntington Beach, LLC
Attachments

cc: Chris Perri/SCAQMD w/o CD
Jillian Baker/SCAQMD
Robert Mason/CH2M HILL w/o CD
Jennifer Didlo/AES w/o CD
Melissa Foster/Stoel Rives
Jerry Salamy/CH2M HILL w/o CD
Felicia Miller/CEC
Tom Chico/SCAQMD w/o CD

Attachment 1
HBEP Operational Impact Assessment

Huntington Beach Energy Project
Attachment 1 Table 1
Operational Modeling Parameters - Stack Parameters
October 2013

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)
1	Stack 1	409185	3723252	3.7	36.6	457	24.1	5.49
	Stack 2	409216	3723231	3.7	36.6	457	24.1	5.49
	Stack 3	409245	3723210	3.7	36.6	457	24.1	5.49
	Stack 4	409522	3723157	3.7	36.6	457	24.1	5.49
	Stack 5	409522	3723194	3.7	36.6	457	24.1	5.49
	Stack 6	409522	3723230	3.7	36.6	457	24.1	5.49
2	Stack 1	409185	3723252	3.7	36.6	474	25.0	5.49
	Stack 2	409216	3723231	3.7	36.6	474	25.0	5.49
	Stack 3	409245	3723210	3.7	36.6	474	25.0	5.49
	Stack 4	409522	3723157	3.7	36.6	474	25.0	5.49
	Stack 5	409522	3723194	3.7	36.6	474	25.0	5.49
	Stack 6	409522	3723230	3.7	36.6	474	25.0	5.49
3	Stack 1	409185	3723252	3.7	36.6	470	22.4	5.49
	Stack 2	409216	3723231	3.7	36.6	470	22.4	5.49
	Stack 3	409245	3723210	3.7	36.6	470	22.4	5.49
	Stack 4	409522	3723157	3.7	36.6	470	22.4	5.49
	Stack 5	409522	3723194	3.7	36.6	470	22.4	5.49
	Stack 6	409522	3723230	3.7	36.6	470	22.4	5.49
4	Stack 1	409185	3723252	3.7	36.6	467	19.5	5.49
	Stack 2	409216	3723231	3.7	36.6	467	19.5	5.49
	Stack 3	409245	3723210	3.7	36.6	467	19.5	5.49
	Stack 4	409522	3723157	3.7	36.6	467	19.5	5.49
	Stack 5	409522	3723194	3.7	36.6	467	19.5	5.49
	Stack 6	409522	3723230	3.7	36.6	467	19.5	5.49
5	Stack 1	409185	3723252	3.7	36.6	463	17.5	5.49
	Stack 2	409216	3723231	3.7	36.6	463	17.5	5.49
	Stack 3	409245	3723210	3.7	36.6	463	17.5	5.49
	Stack 4	409522	3723157	3.7	36.6	463	17.5	5.49
	Stack 5	409522	3723194	3.7	36.6	463	17.5	5.49
	Stack 6	409522	3723230	3.7	36.6	463	17.5	5.49
6	Stack 1	409185	3723252	3.7	36.6	454	22.6	5.49
	Stack 2	409216	3723231	3.7	36.6	454	22.6	5.49
	Stack 3	409245	3723210	3.7	36.6	454	22.6	5.49
	Stack 4	409522	3723157	3.7	36.6	454	22.6	5.49
	Stack 5	409522	3723194	3.7	36.6	454	22.6	5.49
	Stack 6	409522	3723230	3.7	36.6	454	22.6	5.49
7	Stack 1	409185	3723252	3.7	36.6	471	23.6	5.49
	Stack 2	409216	3723231	3.7	36.6	471	23.6	5.49
	Stack 3	409245	3723210	3.7	36.6	471	23.6	5.49
	Stack 4	409522	3723157	3.7	36.6	471	23.6	5.49
	Stack 5	409522	3723194	3.7	36.6	471	23.6	5.49
	Stack 6	409522	3723230	3.7	36.6	471	23.6	5.49
8	Stack 1	409185	3723252	3.7	36.6	467	21.3	5.49
	Stack 2	409216	3723231	3.7	36.6	467	21.3	5.49
	Stack 3	409245	3723210	3.7	36.6	467	21.3	5.49
	Stack 4	409522	3723157	3.7	36.6	467	21.3	5.49
	Stack 5	409522	3723194	3.7	36.6	467	21.3	5.49
	Stack 6	409522	3723230	3.7	36.6	467	21.3	5.49

Huntington Beach Energy Project
Attachment 1 Table 1
Operational Modeling Parameters - Stack Parameters
October 2013

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)
9	Stack 1	409185	3723252	3.7	36.6	463	19.2	5.49
	Stack 2	409216	3723231	3.7	36.6	463	19.2	5.49
	Stack 3	409245	3723210	3.7	36.6	463	19.2	5.49
	Stack 4	409522	3723157	3.7	36.6	463	19.2	5.49
	Stack 5	409522	3723194	3.7	36.6	463	19.2	5.49
	Stack 6	409522	3723230	3.7	36.6	463	19.2	5.49
10	Stack 1	409185	3723252	3.7	36.6	460	16.7	5.49
	Stack 2	409216	3723231	3.7	36.6	460	16.7	5.49
	Stack 3	409245	3723210	3.7	36.6	460	16.7	5.49
	Stack 4	409522	3723157	3.7	36.6	460	16.7	5.49
	Stack 5	409522	3723194	3.7	36.6	460	16.7	5.49
	Stack 6	409522	3723230	3.7	36.6	460	16.7	5.49
11	Stack 1	409185	3723252	3.7	36.6	455	21.8	5.49
	Stack 2	409216	3723231	3.7	36.6	455	21.8	5.49
	Stack 3	409245	3723210	3.7	36.6	455	21.8	5.49
	Stack 4	409522	3723157	3.7	36.6	455	21.8	5.49
	Stack 5	409522	3723194	3.7	36.6	455	21.8	5.49
	Stack 6	409522	3723230	3.7	36.6	455	21.8	5.49
12	Stack 1	409185	3723252	3.7	36.6	472	22.7	5.49
	Stack 2	409216	3723231	3.7	36.6	472	22.7	5.49
	Stack 3	409245	3723210	3.7	36.6	472	22.7	5.49
	Stack 4	409522	3723157	3.7	36.6	472	22.7	5.49
	Stack 5	409522	3723194	3.7	36.6	472	22.7	5.49
	Stack 6	409522	3723230	3.7	36.6	472	22.7	5.49
13	Stack 1	409185	3723252	3.7	36.6	465	19.0	5.49
	Stack 2	409216	3723231	3.7	36.6	465	19.0	5.49
	Stack 3	409245	3723210	3.7	36.6	465	19.0	5.49
	Stack 4	409522	3723157	3.7	36.6	465	19.0	5.49
	Stack 5	409522	3723194	3.7	36.6	465	19.0	5.49
	Stack 6	409522	3723230	3.7	36.6	465	19.0	5.49
14	Stack 1	409185	3723252	3.7	36.6	463	17.3	5.49
	Stack 2	409216	3723231	3.7	36.6	463	17.3	5.49
	Stack 3	409245	3723210	3.7	36.6	463	17.3	5.49
	Stack 4	409522	3723157	3.7	36.6	463	17.3	5.49
	Stack 5	409522	3723194	3.7	36.6	463	17.3	5.49
	Stack 6	409522	3723230	3.7	36.6	463	17.3	5.49
15	Stack 1	409185	3723252	3.7	36.6	461	15.4	5.49
	Stack 2	409216	3723231	3.7	36.6	461	15.4	5.49
	Stack 3	409245	3723210	3.7	36.6	461	15.4	5.49
	Stack 4	409522	3723157	3.7	36.6	461	15.4	5.49
	Stack 5	409522	3723194	3.7	36.6	461	15.4	5.49
	Stack 6	409522	3723230	3.7	36.6	461	15.4	5.49

Huntington Beach Energy Project

Attachment 1 Table 2

Operational Modeling Parameters - Emission Rates

October 2013

Per Turbine Emission Rates for 1-hr, 3-hr, 8-hr, and 24-hr Emissions Scenarios

	1-hr NO_2		1-hr CO		8-hr CO		1-hr SO_2		3-hr SO_2		24-hr SO_2		24-hr PM_{10}		24-hr $PM_{2.5}$	
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)
1	3.21	25.5	14.36	114	6.09	48.3	0.33	2.64	0.33	2.64	0.33	2.64	1.20	9.50	1.20	9.50
2	3.21	25.5	14.36	114	5.91	46.9	0.25	1.97	0.25	1.97	0.25	1.97	0.57	4.50	0.57	4.50
3	3.21	25.5	14.36	114	5.86	46.5	0.23	1.79	0.23	1.79	0.23	1.79	0.57	4.50	0.57	4.50
4	3.21	25.5	14.36	114	5.81	46.1	0.20	1.60	0.20	1.60	0.20	1.60	0.57	4.50	0.57	4.50
5	3.21	25.5	14.36	114	5.78	45.9	0.18	1.46	0.18	1.46	0.18	1.46	0.57	4.50	0.57	4.50
6	3.21	25.5	14.36	114	6.06	48.1	0.32	2.51	0.32	2.51	0.32	2.51	1.20	9.50	1.20	9.50
7	3.21	25.5	14.36	114	5.88	46.7	0.23	1.85	0.23	1.85	0.23	1.85	0.57	4.50	0.57	4.50
8	3.21	25.5	14.36	114	5.83	46.3	0.21	1.67	0.21	1.67	0.21	1.67	0.57	4.50	0.57	4.50
9	3.21	25.5	14.36	114	5.80	46.0	0.19	1.52	0.19	1.52	0.19	1.52	0.57	4.50	0.57	4.50
10	3.21	25.5	14.36	114	5.76	45.7	0.17	1.36	0.17	1.36	0.17	1.36	0.57	4.50	0.57	4.50
11	3.21	25.5	14.36	114	6.04	47.9	0.31	2.45	0.31	2.45	0.31	2.45	1.20	9.50	1.20	9.50
12	3.21	25.5	14.36	114	5.85	46.4	0.22	1.78	0.22	1.78	0.22	1.78	0.57	4.50	0.57	4.50
13	3.21	25.5	14.36	114	5.78	45.9	0.18	1.46	0.18	1.46	0.18	1.46	0.57	4.50	0.57	4.50
14	3.21	25.5	14.36	114	5.75	45.6	0.17	1.33	0.17	1.33	0.17	1.33	0.57	4.50	0.57	4.50
15	3.21	25.5	14.36	114	5.72	45.4	0.15	1.21	0.15	1.21	0.15	1.21	0.57	4.50	0.57	4.50

Per Turbine Emission Rates for Annual Average Emissions Scenarios

	Annual NO_2		Annual PM_{10}		Annual $PM_{2.5}$	
Scenario	(g/s)	(lb/hr)	(g/s)	(lb/hr)	(g/s)	(lb/hr)
7	1.16	9.22	0.48	3.78	0.48	3.78
8	1.08	8.57	0.48	3.78	0.48	3.78
9	1.01	8.03	0.48	3.78	0.48	3.78
10	0.94	7.47	0.48	3.78	0.48	3.78

Huntington Beach Energy Project
Attachment 1 Table 3
Operational Building Parameters for AERMOD Input
October 2013

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)
Admin	2	1	3.66	3.35	16	409290	3723286	409355	3723240	409351	3723235	409348	3723237	409338	3723223	409343	3723219
Admin	*	2	*	5.18	14	409287	3723281	409348	3723237	409338	3723223	409343	3723219	409333	3723205	409321	3723213
adminnew	1	1	3.66	12.19	4	409288	3723182	409306	3723169	409288	3723144	409271	3723157				
Maint	1	1	3.66	10.67	4	409308	3723165	409323	3723154	409310	3723137	409295	3723147				
STG2	1	1	3.66	12.19	4	409165	3723276	409180	3723266	409170	3723252	409156	3723262				
ACC2	1	1	3.66	31.70	4	409212	3723305	409263	3723269	409241	3723237	409189	3723274				
ACC1	1	1	3.66	31.70	4	409474	3723311	409536	3723311	409537	3723274	409474	3723274				
STG1	1	1	3.66	12.19	4	409538	3723247	409556	3723247	409556	3723231	409538	3723231				
CTG4	1	1	3.66	28.04	4	409500	3723162	409517	3723162	409517	3723149	409500	3723150				
CTG5	1	1	3.66	28.04	4	409500	3723198	409517	3723198	409517	3723186	409500	3723186				
CTG6	1	1	3.66	28.04	4	409499	3723236	409517	3723236	409517	3723223	409499	3723224				
CTG1	1	1	3.66	28.04	4	409166	3723235	409176	3723252	409188	3723244	409178	3723228				
CTG2	1	1	3.66	28.04	4	409197	3723216	409207	3723232	409219	3723224	409209	3723208				
CTG3	1	1	3.66	28.04	4	409226	3723194	409236	3723210	409247	3723203	409237	3723187				
AIRIN6	1	1	3.66	11.61	6	409470	3723211	409470	3723215	409475	3723225	409477	3723225	409482	3723215	409482	3723210
AIRIN5	1	1	3.66	11.61	6	409471	3723174	409471	3723178	409476	3723188	409478	3723188	409483	3723178	409483	3723174
AIRIN4	1	1	3.66	11.61	6	409471	3723136	409471	3723141	409476	3723151	409478	3723151	409483	3723140	409483	3723136
AIRIN1	1	1	3.66	11.61	6	409172	3723196	409169	3723199	409163	3723209	409164	3723211	409176	3723208	409179	3723206
AIRIN2	1	1	3.66	11.61	6	409202	3723175	409199	3723178	409194	3723188	409195	3723190	409206	3723187	409209	3723185
AIRIN3	1	1	3.66	11.61	6	409232	3723154	409229	3723157	409224	3723167	409225	3723169	409236	3723166	409239	3723164

Huntington Beach Energy Project
Attachment 1 Table 3
Operational Building Parameters for AERMOD Input
October 2013

Building Name	Number of Tiers	Tier Number	Base Elevation (m)	Tier Height (m)	Number of Corners	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)	Corner 10 East (X) (m)	Corner 10 North (Y) (m)	Corner 11 East (X) (m)	Corner 11 North (Y) (m)	Corner 12 East (X) (m)	Corner 12 North (Y) (m)
Admin	2	1	3.66	3.35	16	409333	3723205	409321	3723213	409323	3723216	409296	3723237	409296	3723237	409292	3723241
Admin	*	2	*	5.18	14	409323	3723216	409296	3723237	409296	3723237	409292	3723241	409293	3723243	409279	3723252
adminnew	1	1	3.66	12.19	4												
Maint	1	1	3.66	10.67	4												
STG2	1	1	3.66	12.19	4												
ACC2	1	1	3.66	31.70	4												
ACC1	1	1	3.66	31.70	4												
STG1	1	1	3.66	12.19	4												
CTG4	1	1	3.66	28.04	4												
CTG5	1	1	3.66	28.04	4												
CTG6	1	1	3.66	28.04	4												
CTG1	1	1	3.66	28.04	4												
CTG2	1	1	3.66	28.04	4												
CTG3	1	1	3.66	28.04	4												
AIRIN6	1	1	3.66	11.61	6												
AIRIN5	1	1	3.66	11.61	6												
AIRIN4	1	1	3.66	11.61	6												
AIRIN1	1	1	3.66	11.61	6												
AIRIN2	1	1	3.66	11.61	6												
AIRIN3	1	1	3.66	11.61	6												

Huntington Beach Energy Project
Attachment 1 Table 3
Operational Building Parameters for AERMOD Input
October 2013

Building Name	Number of Tiers	Tier Number	Base Elevation (m)	Tier Height (m)	Number of Corners	Corner 13 East (X) (m)	Corner 13 North (Y) (m)	Corner 14 East (X) (m)	Corner 14 North (Y) (m)	Corner 15 East (X) (m)	Corner 15 North (Y) (m)	Corner 16 East (X) (m)	Corner 16 North (Y) (m)
Admin	2	1	3.66	3.35	16	409293	3723243	409279	3723252	409292	3723270	409283	3723276
Admin	*	2	*	5.18	14	409292	3723270	409283	3723276				
adminnew	1	1	3.66	12.19	4								
Maint	1	1	3.66	10.67	4								
STG2	1	1	3.66	12.19	4								
ACC2	1	1	3.66	31.70	4								
ACC1	1	1	3.66	31.70	4								
STG1	1	1	3.66	12.19	4								
CTG4	1	1	3.66	28.04	4								
CTG5	1	1	3.66	28.04	4								
CTG6	1	1	3.66	28.04	4								
CTG1	1	1	3.66	28.04	4								
CTG2	1	1	3.66	28.04	4								
CTG3	1	1	3.66	28.04	4								
AIRIN6	1	1	3.66	11.61	6								
AIRIN5	1	1	3.66	11.61	6								
AIRIN4	1	1	3.66	11.61	6								
AIRIN1	1	1	3.66	11.61	6								
AIRIN2	1	1	3.66	11.61	6								
AIRIN3	1	1	3.66	11.61	6								

Huntington Beach Energy Project
Attachment 1 Table 4
Operational Modeling Results Summary
October 2013

Case 1: 32°F, 100% Load with Duct Burner Firing

	NO_2 ($\mu g/m^3$)		CO ($\mu g/m^3$)		SO_2 ($\mu g/m^3$)			PM_{10} ($\mu g/m^3$)		$PM_{2.5}$ ($\mu g/m^3$)	
Year	1-hr	Annual	1-hr	8-hr	1-hr	3-hr	24-hr	24-hr	Annual	24-hr	Annual
2008	32.9	-	184	32.9	4.26	3.01	1.04	3.75	-	3.75	-
2009	17.2	-	96.0	23.2	2.22	1.70	0.47	1.70	-	1.70	-
2010	35.3	-	197.3	36.4	4.57	3.27	0.83	2.98	-	2.98	-
2011	30.4	-	169.8	33.6	3.94	2.85	0.77	2.77	-	2.77	-
2012	24.5	-	137	24.0	3.17	2.04	0.69	2.47	-	2.47	-

Case 2: 32°F, 100% Load

	NO_2 ($\mu g/m^3$)		CO ($\mu g/m^3$)		SO_2 ($\mu g/m^3$)			PM_{10} ($\mu g/m^3$)		$PM_{2.5}$ ($\mu g/m^3$)	
Year	1-hr	Annual	1-hr	8-hr	1-hr	3-hr	24-hr	24-hr	Annual	24-hr	Annual
2008	31.2	-	174	28.8	3.02	2.06	0.70	1.60	-	1.60	-
2009	15.7	-	88.0	20.7	1.52	1.18	0.32	0.74	-	0.74	-
2010	33.4	-	186.4	32.5	3.22	2.26	0.55	1.26	-	1.26	-
2011	28.6	-	159.8	30.4	2.76	1.99	0.54	1.22	-	1.22	-
2012	22.7	-	127	20.8	2.19	1.39	0.44	1.01	-	1.01	-

Case 3: 32°F, 90% Load

	NO_2 ($\mu g/m^3$)		CO ($\mu g/m^3$)		SO_2 ($\mu g/m^3$)			PM_{10} ($\mu g/m^3$)		$PM_{2.5}$ ($\mu g/m^3$)	
Year	1-hr	Annual	1-hr	8-hr	1-hr	3-hr	24-hr	24-hr	Annual	24-hr	Annual
2008	36.4	-	203	37.3	3.19	2.35	0.83	2.08	-	2.08	-
2009	19.4	-	108.2	23.4	1.70	1.27	0.33	0.84	-	0.84	-
2010	39.6	-	221.1	40.7	3.47	2.54	0.66	1.67	-	1.67	-
2011	34.4	-	192.0	35.1	3.02	2.07	0.57	1.43	-	1.43	-
2012	27.9	-	156	27.7	2.45	1.62	0.51	1.29	-	1.29	-

Case 4: 32°F, 80% Load

	NO_2 ($\mu g/m^3$)		CO ($\mu g/m^3$)		SO_2 ($\mu g/m^3$)			PM_{10} ($\mu g/m^3$)		$PM_{2.5}$ ($\mu g/m^3$)	
Year	1-hr	Annual	1-hr	8-hr	1-hr	3-hr	24-hr	24-hr	Annual	24-hr	Annual
2008	43.8	-	245	50.7	3.43	2.67	0.99	2.79	-	2.79	-
2009	26.7	-	149.4	26.7	2.10	1.43	0.35	0.97	-	0.97	-
2010	46.9	-	262	51.4	3.68	2.85	0.75	2.11	-	2.11	-
2011	42.8	-	239.1	41.5	3.36	2.15	0.62	1.74	-	1.74	-
2012	36.0	-	201	37.1	2.82	1.95	0.58	1.64	-	1.64	-

Case 5: 32°F, 70% Load

	NO_2 ($\mu g/m^3$)		CO ($\mu g/m^3$)		SO_2 ($\mu g/m^3$)			PM_{10} ($\mu g/m^3$)		$PM_{2.5}$ ($\mu g/m^3$)	
Year	1-hr	Annual	1-hr	8-hr	1-hr	3-hr	24-hr	24-hr	Annual	24-hr	Annual
2008	49.1	-	274	63.3	3.51	2.93	1.14	3.53	-	3.53	-
2009	32.9	-	184	29.8	2.36	1.62	0.39	1.20	-	1.20	-
2010	53.0	-	296	60.9	3.80	3.07	0.82	2.52	-	2.52	-
2011	49.6	-	277	48.1	3.55	2.22	0.69	2.14	-	2.14	-
2012	42.8	-	239	48.5	3.07	2.23	0.64	1.96	-	1.96	-

Case 6: 66°F, 100% Load with Duct Burner Firing

	NO_2 ($\mu g/m^3$)		CO ($\mu g/m^3$)		SO_2 ($\mu g/m^3$)			PM_{10} ($\mu g/m^3$)		$PM_{2.5}$ ($\mu g/m^3$)	
Year	1-hr	Annual	1-hr	8-hr	1-hr	3-hr	24-hr	24-hr	Annual	24-hr	Annual
2008	36.3	-	203	38.4	4.47	3.27	1.17	4.41	-	4.41	-
2009	19.5	-	109.0	25.0	2.40	1.80	0.49	1.84	-	1.84	-
2010	39.5	-	220.8	41.7	4.86	3.54	0.93	3.51	-	3.51	-
2011	34.1	-	190.6	36.7	4.20	2.93	0.80	3.05	-	3.05	-
2012	28.1	-	157	28.5	3.46	2.27	0.73	2.76	-	2.76	-

Case 7: 66°F, 100% Load

	NO_2 ($\mu g/m^3$)		CO ($\mu g/m^3$)		SO_2 ($\mu g/m^3$)			PM_{10} ($\mu g/m^3$)		$PM_{2.5}$ ($\mu g/m^3$)	
Year	1-hr	Annual	1-hr	8-hr	1-hr	3-hr	24-hr	24-hr	Annual	24-hr	Annual
2008	34.2	0.34	191	32.9	3.11	2.19	0.76	1.86	0.19	1.86	0.19
2009	17.5	0.32	97.9	22.1	1.59	1.22	0.33	0.79	0.18	0.79	0.18
2010	36.4	0.27	203.7	36.5	3.31	2.38	0.61	1.48	0.15	1.48	0.15
2011	31.4	0.32	175.2	32.9	2.85	2.01	0.55	1.33	0.17	1.33	0.17
2012	25.8	0.32	144	24.1	2.34	1.48	0.48	1.18	0.18	1.18	0.18

Case 8: 66°F, 90% Load

	NO_2 ($\mu g/m^3$)		CO ($\mu g/m^3$)		SO_2 ($\mu g/m^3$)			PM_{10} ($\mu g/m^3$)		$PM_{2.5}$ ($\mu g/m^3$)	
Year	1-hr	Annual	1-hr	8-hr	1-hr	3-hr	24-hr	24-hr	Annual	24-hr	Annual
2008	38.8	0.35	217	42.0	3.18	2.42	0.86	2.32	0.21	2.32	0.21
2009	21.7	0.34	121.5	24.6	1.78	1.29	0.33	0.89	0.20	0.89	0.20
2010	42.4	0.28	237.1	44.4	3.48	2.59	0.68	1.82	0.17	1.82	0.17
2011	37.3	0.33	208.6	37.3	3.06	2.04	0.56	1.52	0.19	1.52	0.19
2012	30.8	0.34	172	30.8	2.53	1.69	0.52	1.40	0.20	1.40	0.20

Huntington Beach Energy Project
Attachment 1 Table 4
Operational Modeling Results Summary
October 2013

Case 9: 66°F, 80% Load

	NO_2 ($\mu g/m^3$)		CO ($\mu g/m^3$)		SO_2 ($\mu g/m^3$)			PM_{10} ($\mu g/m^3$)		$PM_{2.5}$ ($\mu g/m^3$)	
Year	1-hr	Annual	1-hr	8-hr	1-hr	3-hr	24-hr	24-hr	Annual	24-hr	Annual
2008	44.2	0.37	247	52.6	3.29	2.64	0.97	2.88	0.23	2.88	0.23
2009	27.7	0.36	154.6	27.3	2.06	1.40	0.34	1.01	0.22	1.01	0.22
2010	47.8	0.30	267	52.8	3.56	2.78	0.73	2.17	0.19	2.17	0.19
2011	43.7	0.35	244	42.5	3.26	2.09	0.61	1.79	0.22	1.79	0.22
2012	37.4	0.36	209	38.4	2.79	1.93	0.57	1.69	0.22	1.69	0.22

Case 10: 66°F, 70% Load

	NO_2 ($\mu g/m^3$)		CO ($\mu g/m^3$)		SO_2 ($\mu g/m^3$)			PM_{10} ($\mu g/m^3$)		$PM_{2.5}$ ($\mu g/m^3$)	
Year	1-hr	Annual	1-hr	8-hr	1-hr	3-hr	24-hr	24-hr	Annual	24-hr	Annual
2008	50.9	0.40	284	68.7	3.39	2.93	1.16	3.85	0.27	3.85	0.27
2009	36.1	0.38	202	31.4	2.41	1.68	0.42	1.39	0.26	1.39	0.26
2010	54.7	0.33	306	64.7	3.65	3.05	0.82	2.71	0.22	2.71	0.22
2011	52.2	0.37	292	50.5	3.48	2.17	0.69	2.29	0.25	2.29	0.25
2012	46.2	0.38	258	52.7	3.08	2.26	0.64	2.13	0.26	2.13	0.26

Case 11: 110°F, 100% Load with Duct Burner Firing

	NO_2 ($\mu g/m^3$)		CO ($\mu g/m^3$)		SO_2 ($\mu g/m^3$)			PM_{10} ($\mu g/m^3$)		$PM_{2.5}$ ($\mu g/m^3$)	
Year	1-hr	Annual	1-hr	8-hr	1-hr	3-hr	24-hr	24-hr	Annual	24-hr	Annual
2008	38.0	-	213	41.8	4.57	3.43	1.22	4.72	-	4.72	-
2009	21.0	-	117.5	25.7	2.53	1.85	0.49	1.90	-	1.90	-
2010	41.2	-	230.1	44.5	4.95	3.70	0.97	3.74	-	3.74	-
2011	36.1	-	202.0	38.3	4.34	2.98	0.82	3.19	-	3.19	-
2012	29.6	-	165	30.9	3.55	2.41	0.76	2.95	-	2.95	-

Case 12: 110°F, 100% Load

	NO_2 ($\mu g/m^3$)		CO ($\mu g/m^3$)		SO_2 ($\mu g/m^3$)			PM_{10} ($\mu g/m^3$)		$PM_{2.5}$ ($\mu g/m^3$)	
Year	1-hr	Annual	1-hr	8-hr	1-hr	3-hr	24-hr	24-hr	Annual	24-hr	Annual
2008	35.7	-	199	35.6	3.11	2.25	0.79	2.00	-	2.00	-
2009	18.9	-	105.6	22.8	1.65	1.22	0.33	0.83	-	0.83	-
2010	38.7	-	216.4	39.2	3.38	2.45	0.64	1.61	-	1.61	-
2011	33.5	-	187.0	34.2	2.92	2.01	0.55	1.39	-	1.39	-
2012	27.5	-	154	26.5	2.40	1.54	0.49	1.24	-	1.24	-

Case 13: 110°F, 90% Load

	NO_2 ($\mu g/m^3$)		CO ($\mu g/m^3$)		SO_2 ($\mu g/m^3$)			PM_{10} ($\mu g/m^3$)		$PM_{2.5}$ ($\mu g/m^3$)	
Year	1-hr	Annual	1-hr	8-hr	1-hr	3-hr	24-hr	24-hr	Annual	24-hr	Annual
2008	44.8	-	250	53.2	3.21	2.56	0.95	2.93	-	2.93	-
2009	28.3	-	158.4	27.4	2.03	1.38	0.33	1.01	-	1.01	-
2010	48.7	-	272	53.5	3.49	2.71	0.71	2.20	-	2.20	-
2011	44.7	-	250	43.0	3.20	2.03	0.59	1.82	-	1.82	-
2012	37.6	-	210	39.3	2.70	1.92	0.55	1.71	-	1.71	-

Case 14: 110°F, 80% Load

	NO_2 ($\mu g/m^3$)		CO ($\mu g/m^3$)		SO_2 ($\mu g/m^3$)			PM_{10} ($\mu g/m^3$)		$PM_{2.5}$ ($\mu g/m^3$)	
Year	1-hr	Annual	1-hr	8-hr	1-hr	3-hr	24-hr	24-hr	Annual	24-hr	Annual
2008	49.4	-	276	64.6	3.22	2.73	1.07	3.63	-	3.63	-
2009	33.8	-	189	30.1	2.21	1.53	0.37	1.25	-	1.25	-
2010	53.5	-	299	61.9	3.49	2.87	0.77	2.59	-	2.59	-
2011	50.4	-	281	48.5	3.29	2.05	0.64	2.18	-	2.18	-
2012	44.1	-	246	49.9	2.87	2.09	0.59	2.01	-	2.01	-

Case 15: 110°F, 70% Load

	NO_2 ($\mu g/m^3$)		CO ($\mu g/m^3$)		SO_2 ($\mu g/m^3$)			PM_{10} ($\mu g/m^3$)		$PM_{2.5}$ ($\mu g/m^3$)	
Year	1-hr	Annual	1-hr	8-hr	1-hr	3-hr	24-hr	24-hr	Annual	24-hr	Annual
2008	54.1	-	302	78.4	3.21	2.88	1.17	4.36	-	4.36	-
2009	41.4	-	231	36.2	2.46	1.74	0.43	1.61	-	1.61	-
2010	58.6	-	328	71.9	3.48	2.99	0.81	3.00	-	3.00	-
2011	56.1	-	314	54.9	3.33	2.10	0.68	2.54	-	2.54	-
2012	51.4	-	287	59.7	3.05	2.31	0.66	2.45	-	2.45	-

The maximum 1-hour and annual NO_2 concentrations include ambient NO_2 ratios of 0.80 and 0.75, respectively.

Attachment 2
HBEP SCAQMD Correspondence Related to Orange County Sanitation District and Beta Offshore

From: Jillian Baker [mailto:jbaker@aqmd.gov]
Sent: Thursday, September 05, 2013 6:31 PM
To: Salamy, Jerry/SAC; stephen.okane@AES.com
Cc: Tom Chico; Chris Perri; Andrew Lee; John Yee; Charles Tupac
Subject: AES Huntington Beach - Information to use in Cumulative Modeling

Hi Jerry,

Attached are the stack parameters and PTE emission rates for the 2 OCSD facilities you included in your cumulative analysis.

I am currently working with Beta Offshore to get a better idea of their stack parameters and to match them up with the PTE emission rates we have in our system.

Jillian Baker, Ph.D.
South Coast AQMD
21865 Copley Drive,
Diamond Bar, CA 91765
Direct: 909.396.3176

OCSD Huntington Beach (Facility ID 29110)

Source Type	ID	UTM (NAD83) X (m)	UTM (NAD83) Y (m)	Emission Rate (lb/hr)	Release Height (ft)	Diameter (ft)	Exit Velocity (ft/min)	Exit Temp (deg F)
POINT	2911001	411070.5	3722313.1	0.6	25	1.75	1464.69	394.73
POINT	2911002	411096.1	3722214.1	0.9	24.3	2.23	270.2	1499.7
POINT	2911003	411239.9	3722454.7	6.9	59	2.5	4499.82	600
POINT	2911004	411247.8	3722454.7	6.9	59	2.5	4499.82	600
POINT	2911005	411255.3	3722454.7	6.9	59	2.5	4499.82	600
POINT	2911006	411262.8	3722454.7	6.9	59	2.5	4499.82	600
POINT	2911007	411270.3	3722454.7	6.9	59	2.5	4499.82	600

OCSD Fountain Valley (Facility ID 17301)

Source Type	ID	UTM (NAD83) X (m)	UTM (NAD83) Y (m)	Emission Rate (lb/hr)	Release Height (ft)	Diameter (ft)	Exit Velocity (ft/min)	Flow Rate (ft3/min)	Exit Temp (deg F)
POINT	1730101	412961.9	3728358.9	5.17	24.3	7.3	270.2		1499.7
POINT	1730102	412913.7	3728328	0.08	25	1.8	1384.5		394.7
POINT	1730103	412935	3728400.9	7.79	62	2.5	3519.03		500
POINT	1730104	412942.1	3728391.3	7.79	62	2.5	3519.03		500
POINT	1730105	412938.6	3728396.1	7.79	62	2.5	3519.03		500

Engel, Elyse/SJC

From: Jillian Baker [jbaker@aqmd.gov]
Sent: Tuesday, October 01, 2013 5:36 PM
To: Salamy, Jerry/SAC; stephen.okane@AES.com
Cc: Tom Chico; Chris Perri; Andrew Lee; John Yee; Charles Tupac; Engel, Elyse/SJC; Frohning, John/SEA
Subject: RE: AES Huntington Beach - Information to use in Cumulative Modeling
Attachments: 166073 - Beta Offshore.xlsx

Hi Jerry,

Attached are the parameters to use for Beta Offshore in the NO2 cumulative assessment for AES Huntington Beach. Please be sure to take note of the units for each of the parameters as they may be different for each facility provided. As discussed previously, the shipping lane sources and Beta Offshore sources should be treated as RURAL sources in AERMOD.

Please let me know if you have any questions.

Jillian Baker, Ph.D.
South Coast AQMD
21865 Copley Drive,
Diamond Bar, CA 91765
Direct: 909.396.3176

From: Jerry.Salamy@CH2M.com [mailto:Jerry.Salamy@CH2M.com]
Sent: Friday, September 06, 2013 1:57 PM
To: Jillian Baker; stephen.okane@AES.com
Cc: Tom Chico; Chris Perri; Andrew Lee; John Yee; Charles Tupac; Elyse.Engel@ch2m.com; John.Frohning@CH2M.com
Subject: RE: AES Huntington Beach - Information to use in Cumulative Modeling

Hi Jillian,

Thanks for the OCSD modeling data, it will help greatly in completing the cumulative 1-hour NO2 assessment. Who do we coordinate with regarding the Beta Offshore modeling parameters and other questions we may have while you are out of the office?

Thanks,

Jerry Salamy
Principal Project Manager
CH2M HILL/Sacramento
Phone 916-286-0207
Fax 916-614-3407
Cell Phone 916-769-8919

From: Jillian Baker [mailto:jbaker@aqmd.gov]
Sent: Thursday, September 05, 2013 6:31 PM
To: Salamy, Jerry/SAC; stephen.okane@AES.com
Cc: Tom Chico; Chris Perri; Andrew Lee; John Yee; Charles Tupac
Subject: AES Huntington Beach - Information to use in Cumulative Modeling

Hi Jerry,

Attached are the stack parameters and PTE emission rates for the 2 OCSD facilities you included in your cumulative analysis.

I am currently working with Beta Offshore to get a better idea of their stack parameters and to match them up with the PTE emission rates we have in our system.

Jillian Baker, Ph.D.
South Coast AQMD
21865 Copley Drive,
Diamond Bar, CA 91765
Direct: 909.396.3176

Beta Offshore (Facility ID 166073)

Source Type	ID	UTM (NAD83) X (m)	UTM (NAD83) Y (m)	Elevation (m)	Emission Rate (lb/hr)	Release Height (ft)	Diameter (inches)	Exit Velocity (ft/s)	Flow Rate (ft3/min)	Exit Temp (F)
POINT	16607301	395222	3716431	0	15.04	60	12	101.97		730.3
POINT	16607302	395222	3716431	0	15.04	60	12	98.28		693.3
POINT	16607303	395222	3716431	0	15.04	60	12	79.5		593
POINT	16607304	394082	3717932	0	15.04	60	12	94.18		733.7
POINT	16607305	394082	3717932	0	15.04	60	12	113.95		772
POINT	16607306	394082	3717932	0	15.04	60	12	69.1		590
POINT	16607307	395265	3716554	0	2.9	60	24	129.17		748.75
POINT	16607308	395265	3716554	0	2.5	60	24	125		747.5
POINT	16607309	395265	3716554	0	2.8	60	24	123		759
POINT	16607310	395265	3716554	0	20	60	30	266.5		749
POINT	16607311	395265	3716554	0	19.7	60	30	266		745
POINT	16607312	395265	3716554	0	19.7	60	30	267		742.5
POINT	16607313	395265	3716554	0	81.6	75	20	27.38		375.5

Attachment 3
HBEP SCAQMD Correspondence Related to Shipping Lanes

From: Jillian Baker [mailto:jbaker@aqmd.gov]
Sent: Friday, June 14, 2013 4:40 PM
To: Stephen O'Kane; Frohning, John/SEA
Cc: Tom Chico; Chris Perri; Vicky Lee; John Yee; Andrew Lee; Salamy, Jerry/SAC
Subject: RE: Written Comments on AES Huntington Beach and AES Redondo Beach Modeling Protocol Addendums

Hi Stephen,

Attached is an Excel spreadsheet with the shipping lane information. As I mentioned earlier, this is the draft methodology we proposed to EPA and have not yet received approval, so this information is subject to change.

Based on your public records request for the AB2588 files, we are working on putting together a spreadsheet with the relevant stack parameters and PTE emission rates for the Exxon-Mobil refinery. You should get that information by next Friday through our public records dept. Please remember that until we get approval from EPA, the facilities we talked about for the cumulative modeling are also subject to change.

Jillian Baker, Ph.D.
South Coast AQMD
21865 Copley Drive,
Diamond Bar, CA 91765
Direct: 909.396.3176

From: Stephen O'Kane [mailto:stephen.okane@AES.com]
Sent: Friday, June 14, 2013 3:54 PM
To: Jillian Baker; John.Frohning@CH2M.com
Cc: Tom Chico; Chris Perri; Vicky Lee; John Yee; Andrew Lee; Jerry.Salamy@CH2M.com
Subject: RE: Written Comments on AES Huntington Beach and AES Redondo Beach Modeling Protocol Addendums

I think we would like to get it now and continue to seek some sort of approval or acknowledgement from Region 9 in the meantime.

More important to us right now is the HARP modeling inputs for the Exxon-Mobil refinery. We've received the permit information from this facility but really need the AB2588 source parameters. Can you give us any ETA on that data?

Thanks

Stephen O'Kane

From: Jillian Baker [mailto:jbaker@aqmd.gov]
Sent: Friday, June 14, 2013 3:50 PM
To: Stephen O'Kane; John.Frohning@CH2M.com

Cc: Tom Chico; Chris Perri; Vicky Lee; John Yee; Andrew Lee; Jerry.Salamy@CH2M.com
Subject: RE: Written Comments on AES Huntington Beach and AES Redondo Beach Modeling Protocol Addendums

Hi Stephen,

As a follow-up to my email, I wanted to let you know that I have the shipping lane information available, however, my approach (the source characterization and how the sources are to be modeled in AERMOD) has not yet been approved by EPA Region 9. Without their approval, I cannot guarantee that the shipping lane information will not change in the future. Please let me know if you would like to have this information now or would like to wait till we get our approval from EPA.

Jillian Baker, Ph.D.
South Coast AQMD
21865 Copley Drive,
Diamond Bar, CA 91765
Direct: 909.396.3176

From: Jillian Baker
Sent: Friday, May 31, 2013 5:22 PM
To: 'Stephen O'Kane'; John.Frohning@CH2M.com
Cc: Tom Chico; Chris Perri; Vicky Lee; John Yee; Andrew Lee; Jerry.Salamy@CH2M.com
Subject: RE: Written Comments on AES Huntington Beach and AES Redondo Beach Modeling Protocol Addendums

Hi Stephen,

I will be able to provide the shipping information within the next 2 weeks. However, for the facility information, it is my understanding that you will need to submit a public records request for that. We discussed the procedure on the conference call on 4/5/13 and I believe that John Frohning has requested the information and is in the process of collecting it. Once you have put together the information, you can send it to me in an email and I will review and let you know if the information is correct.

Jillian Baker, Ph.D.
South Coast AQMD
21865 Copley Drive,
Diamond Bar, CA 91765
Direct: 909.396.3176

From: Stephen O'Kane [mailto:stephen.okane@AES.com]
Sent: Friday, May 31, 2013 3:09 PM
To: Jillian Baker; John.Frohning@CH2M.com
Cc: Tom Chico; Chris Perri; Vicky Lee; John Yee; Andrew Lee; Jerry.Salamy@CH2M.com
Subject: RE: Written Comments on AES Huntington Beach and AES Redondo Beach Modeling Protocol Addendums

Thank you Jillian. Please let us know your ETA for providing the appropriate modeling emissions data and source parameters for the following:

AES Redondo Beach:
ExxonMobil (ID#800089)

AES Huntington Beach
Orange County Sanitation District (ID#29110) and Beta offshore (ID#166073) and Shipping lane activity off the coast (AQMD to provide you with the UTM coordinates, modeling parameters, and emission rates to be used)

Your attention to this matter is appreciated.

Stephen O'Kane

From: Jillian Baker [mailto:jbaker@aqmd.gov]
Sent: Friday, May 31, 2013 2:55 PM
To: John.Frohning@CH2M.com; Stephen O'Kane
Cc: Tom Chico; Chris Perri; Vicky Lee; John Yee; Andrew Lee
Subject: Written Comments on AES Huntington Beach and AES Redondo Beach Modeling Protocol Addendums

Hi John and Stephen,

Here are our written comments on the Modeling Protocol Addendums you provided for the two AES projects. These modeling protocol addendums are for modeling related to the 1-hour NO2 cumulative impact assessment, which is triggered because the project's NO2 emissions exceed the SIL of 7.52 $\mu g/m^3$.

AES Huntington Beach – Modeling Protocol Addendum (dated March 22, 2013)

- These comments (except for the last item) were discussed on our conference call on 4/5/13.
- When using PVMRM to calculate the conversion of NOx to NO2, an ambient ratio of 0.9 will have to be used. If you would like to use any other ratio, then justification needs to be provided as to the validity of that ratio.
- We will provide you with the background NO2 concentrations to use. (This was provided to you on 4/16/13)
- For the cumulative impact assessment, facilities within a 10-km radius will have to be considered.
- An analysis of the visibility impacts to Class II areas using VISCREEN needs to be provided. We suggested looking at the LADWP Scattergood comment letter and the response provided as a guide to what EPA is looking for. For example, looking at a state or regional park and using the IMPROVE network suggested visual range in the analysis.
- We will continue to work with you to narrow down the facilities which need to be included. We have proposed an approach to EPA and are waiting for their approval. This preliminary approach includes:
    - Two facilities to be included in the cumulative analysis - Orange County Sanitation District (ID#29110) and Beta offshore (ID#166073)
    - Shipping lane activity off the coast (I will provide you with the UTM coordinates, modeling parameters, and emission rates to be used)
    - The existing operations occurring at AES HB will be included unless that equipment will be removed and not operational when the new equipment becomes operational.
    - As soon as EPA approves this approach, we will let you know.

AES Redondo Beach – Modeling Protocol Addendum (dated May 9, 2013)

- An analysis of the visibility impacts to Class II areas using VISCREEN needs to be provided. We suggested looking at the LADWP Scattergood comment letter and the response provided as a guide to what EPA is looking for. For example, looking at a state or regional park and using the IMPROVE network suggested visual range in the analysis.
- We will continue to work with you to narrow down the facilities which need to be included. We have proposed an approach to EPA and are waiting for their approval. This preliminary approach includes:
    - One facility to be included in the cumulative analysis – ExxonMobil (ID#800089).
    - The existing operations occurring at AES RB will be included unless that equipment will be removed and not operational when the new equipment becomes operational.
    - As soon as EPA approves this approach, we will let you know.

Please let me know if you have any questions.

Jillian Baker, Ph.D.
South Coast AQMD
21865 Copley Drive,

Diamond Bar, CA 91765
Direct: 909.396.3176

Shipping Lanes

Source ID	UTM X (m)	UTM Y (m)	Base Elevation (m)	Height (m)	Emission Rate (g/s)	Sigma Y (m)	Sigma Z (m)	Length of Side (m)
774401	402983	3708740	0	0	0.013626389	186.0465116	23.25581395	800
774402	402183	3708740	0	0	0.013626389	186.0465116	23.25581395	800
774403	401383	3708740	0	0	0.013626389	186.0465116	23.25581395	800
774404	400583	3708740	0	0	0.013626389	186.0465116	23.25581395	800
774405	399783	3708740	0	0	0.013626389	186.0465116	23.25581395	800
774406	402983	3707940	0	0	0.013626389	186.0465116	23.25581395	800
774407	402183	3707940	0	0	0.013626389	186.0465116	23.25581395	800
774408	401383	3707940	0	0	0.013626389	186.0465116	23.25581395	800
774409	400583	3707940	0	0	0.013626389	186.0465116	23.25581395	800
774410	399783	3707940	0	0	0.013626389	186.0465116	23.25581395	800
774411	402983	3707140	0	0	0.013626389	186.0465116	23.25581395	800
774412	402183	3707140	0	0	0.013626389	186.0465116	23.25581395	800
774413	401383	3707140	0	0	0.013626389	186.0465116	23.25581395	800
774414	400583	3707140	0	0	0.013626389	186.0465116	23.25581395	800
774415	399783	3707140	0	0	0.013626389	186.0465116	23.25581395	800
774416	402983	3706340	0	0	0.013626389	186.0465116	23.25581395	800
774417	402183	3706340	0	0	0.013626389	186.0465116	23.25581395	800
774418	401383	3706340	0	0	0.013626389	186.0465116	23.25581395	800
774419	400583	3706340	0	0	0.013626389	186.0465116	23.25581395	800
774420	399783	3706340	0	0	0.013626389	186.0465116	23.25581395	800
774421	402983	3705540	0	0	0.013626389	186.0465116	23.25581395	800
774422	402183	3705540	0	0	0.013626389	186.0465116	23.25581395	800
774423	401383	3705540	0	0	0.013626389	186.0465116	23.25581395	800
774424	400583	3705540	0	0	0.013626389	186.0465116	23.25581395	800
774425	399783	3705540	0	0	0.013626389	186.0465116	23.25581395	800
774301	402983	3704740	0	0	0.045962963	186.0465116	23.25581395	800
774302	402183	3704740	0	0	0.045962963	186.0465116	23.25581395	800
774303	401383	3704740	0	0	0.045962963	186.0465116	23.25581395	800
774304	400583	3704740	0	0	0.045962963	186.0465116	23.25581395	800
774305	399783	3704740	0	0	0.045962963	186.0465116	23.25581395	800
774306	402983	3703940	0	0	0.045962963	186.0465116	23.25581395	800
774307	402183	3703940	0	0	0.045962963	186.0465116	23.25581395	800
774308	401383	3703940	0	0	0.045962963	186.0465116	23.25581395	800
774309	400583	3703940	0	0	0.045962963	186.0465116	23.25581395	800
774310	399783	3703940	0	0	0.045962963	186.0465116	23.25581395	800
774311	402983	3703140	0	0	0.045962963	186.0465116	23.25581395	800
774312	402183	3703140	0	0	0.045962963	186.0465116	23.25581395	800
774313	401383	3703140	0	0	0.045962963	186.0465116	23.25581395	800
774314	400583	3703140	0	0	0.045962963	186.0465116	23.25581395	800
774315	399783	3703140	0	0	0.045962963	186.0465116	23.25581395	800
774316	402983	3702340	0	0	0.045962963	186.0465116	23.25581395	800
774317	402183	3702340	0	0	0.045962963	186.0465116	23.25581395	800
774318	401383	3702340	0	0	0.045962963	186.0465116	23.25581395	800
774319	400583	3702340	0	0	0.045962963	186.0465116	23.25581395	800
774320	399783	3702340	0	0	0.045962963	186.0465116	23.25581395	800
774321	402983	3701540	0	0	0.045962963	186.0465116	23.25581395	800
774322	402183	3701540	0	0	0.045962963	186.0465116	23.25581395	800
774323	401383	3701540	0	0	0.045962963	186.0465116	23.25581395	800
774324	400583	3701540	0	0	0.045962963	186.0465116	23.25581395	800
774325	399783	3701540	0	0	0.045962963	186.0465116	23.25581395	800
774201	402983	3700740	0	0	0.079824074	186.0465116	23.25581395	800
774202	402183	3700740	0	0	0.079824074	186.0465116	23.25581395	800
774203	401383	3700740	0	0	0.079824074	186.0465116	23.25581395	800
774204	400583	3700740	0	0	0.079824074	186.0465116	23.25581395	800
774205	399783	3700740	0	0	0.079824074	186.0465116	23.25581395	800
774206	402983	3699940	0	0	0.079824074	186.0465116	23.25581395	800
774207	402183	3699940	0	0	0.079824074	186.0465116	23.25581395	800
774208	401383	3699940	0	0	0.079824074	186.0465116	23.25581395	800
774209	400583	3699940	0	0	0.079824074	186.0465116	23.25581395	800
774210	399783	3699940	0	0	0.079824074	186.0465116	23.25581395	800
774211	402983	3699140	0	0	0.079824074	186.0465116	23.25581395	800

Shipping Lanes

Source ID	UTM X (m)	UTM Y (m)	Base Elevation (m)	Height (m)	Emission Rate (g/s)	Sigma Y (m)	Sigma Z (m)	Length of Side (m)
774212	402183	3699140	0	0	0.079824074	186.0465116	23.25581395	800
774213	401383	3699140	0	0	0.079824074	186.0465116	23.25581395	800
774214	400583	3699140	0	0	0.079824074	186.0465116	23.25581395	800
774215	399783	3699140	0	0	0.079824074	186.0465116	23.25581395	800
774216	402983	3698340	0	0	0.079824074	186.0465116	23.25581395	800
774217	402183	3698340	0	0	0.079824074	186.0465116	23.25581395	800
774218	401383	3698340	0	0	0.079824074	186.0465116	23.25581395	800
774219	400583	3698340	0	0	0.079824074	186.0465116	23.25581395	800
774220	399783	3698340	0	0	0.079824074	186.0465116	23.25581395	800
774221	402983	3697540	0	0	0.079824074	186.0465116	23.25581395	800
774222	402183	3697540	0	0	0.079824074	186.0465116	23.25581395	800
774223	401383	3697540	0	0	0.079824074	186.0465116	23.25581395	800
774224	400583	3697540	0	0	0.079824074	186.0465116	23.25581395	800
774225	399783	3697540	0	0	0.079824074	186.0465116	23.25581395	800
764601	398983	3716740	0	0	0.034443056	186.0465116	23.25581395	800
764602	398183	3716740	0	0	0.034443056	186.0465116	23.25581395	800
764603	397383	3716740	0	0	0.034443056	186.0465116	23.25581395	800
764604	396583	3716740	0	0	0.034443056	186.0465116	23.25581395	800
764605	395783	3716740	0	0	0.034443056	186.0465116	23.25581395	800
764606	398983	3715940	0	0	0.034443056	186.0465116	23.25581395	800
764607	398183	3715940	0	0	0.034443056	186.0465116	23.25581395	800
764608	397383	3715940	0	0	0.034443056	186.0465116	23.25581395	800
764609	396583	3715940	0	0	0.034443056	186.0465116	23.25581395	800
764610	395783	3715940	0	0	0.034443056	186.0465116	23.25581395	800
764611	398983	3715140	0	0	0.034443056	186.0465116	23.25581395	800
764612	398183	3715140	0	0	0.034443056	186.0465116	23.25581395	800
764613	397383	3715140	0	0	0.034443056	186.0465116	23.25581395	800
764614	396583	3715140	0	0	0.034443056	186.0465116	23.25581395	800
764615	395783	3715140	0	0	0.034443056	186.0465116	23.25581395	800
764616	398983	3714340	0	0	0.034443056	186.0465116	23.25581395	800
764617	398183	3714340	0	0	0.034443056	186.0465116	23.25581395	800
764618	397383	3714340	0	0	0.034443056	186.0465116	23.25581395	800
764619	396583	3714340	0	0	0.034443056	186.0465116	23.25581395	800
764620	395783	3714340	0	0	0.034443056	186.0465116	23.25581395	800
764621	398983	3713540	0	0	0.034443056	186.0465116	23.25581395	800
764622	398183	3713540	0	0	0.034443056	186.0465116	23.25581395	800
764623	397383	3713540	0	0	0.034443056	186.0465116	23.25581395	800
764624	396583	3713540	0	0	0.034443056	186.0465116	23.25581395	800
764625	395783	3713540	0	0	0.034443056	186.0465116	23.25581395	800
764501	398983	3712740	0	0	0.045964352	186.0465116	23.25581395	800
764502	398183	3712740	0	0	0.045964352	186.0465116	23.25581395	800
764503	397383	3712740	0	0	0.045964352	186.0465116	23.25581395	800
764504	396583	3712740	0	0	0.045964352	186.0465116	23.25581395	800
764505	395783	3712740	0	0	0.045964352	186.0465116	23.25581395	800
764506	398983	3711940	0	0	0.045964352	186.0465116	23.25581395	800
764507	398183	3711940	0	0	0.045964352	186.0465116	23.25581395	800
764508	397383	3711940	0	0	0.045964352	186.0465116	23.25581395	800
764509	396583	3711940	0	0	0.045964352	186.0465116	23.25581395	800
764510	395783	3711940	0	0	0.045964352	186.0465116	23.25581395	800
764511	398983	3711140	0	0	0.045964352	186.0465116	23.25581395	800
764512	398183	3711140	0	0	0.045964352	186.0465116	23.25581395	800
764513	397383	3711140	0	0	0.045964352	186.0465116	23.25581395	800
764514	396583	3711140	0	0	0.045964352	186.0465116	23.25581395	800
764515	395783	3711140	0	0	0.045964352	186.0465116	23.25581395	800
764516	398983	3710340	0	0	0.045964352	186.0465116	23.25581395	800
764517	398183	3710340	0	0	0.045964352	186.0465116	23.25581395	800
764518	397383	3710340	0	0	0.045964352	186.0465116	23.25581395	800
764519	396583	3710340	0	0	0.045964352	186.0465116	23.25581395	800
764520	395783	3710340	0	0	0.045964352	186.0465116	23.25581395	800
764521	398983	3709540	0	0	0.045964352	186.0465116	23.25581395	800
764522	398183	3709540	0	0	0.045964352	186.0465116	23.25581395	800

Shipping Lanes

Source ID	UTM X (m)	UTM Y (m)	Base Elevation (m)	Height (m)	Emission Rate (g/s)	Sigma Y (m)	Sigma Z (m)	Length of Side (m)
764523	397383	3709540	0	0	0.045964352	186.0465116	23.25581395	800
764524	396583	3709540	0	0	0.045964352	186.0465116	23.25581395	800
764525	395783	3709540	0	0	0.045964352	186.0465116	23.25581395	800
764401	398983	3708740	0	0	0.045964352	186.0465116	23.25581395	800
764402	398183	3708740	0	0	0.045964352	186.0465116	23.25581395	800
764403	397383	3708740	0	0	0.045964352	186.0465116	23.25581395	800
764404	396583	3708740	0	0	0.045964352	186.0465116	23.25581395	800
764405	395783	3708740	0	0	0.045964352	186.0465116	23.25581395	800
764406	398983	3707940	0	0	0.045964352	186.0465116	23.25581395	800
764407	398183	3707940	0	0	0.045964352	186.0465116	23.25581395	800
764408	397383	3707940	0	0	0.045964352	186.0465116	23.25581395	800
764409	396583	3707940	0	0	0.045964352	186.0465116	23.25581395	800
764410	395783	3707940	0	0	0.045964352	186.0465116	23.25581395	800
764411	398983	3707140	0	0	0.045964352	186.0465116	23.25581395	800
764412	398183	3707140	0	0	0.045964352	186.0465116	23.25581395	800
764413	397383	3707140	0	0	0.045964352	186.0465116	23.25581395	800
764414	396583	3707140	0	0	0.045964352	186.0465116	23.25581395	800
764415	395783	3707140	0	0	0.045964352	186.0465116	23.25581395	800
764416	398983	3706340	0	0	0.045964352	186.0465116	23.25581395	800
764417	398183	3706340	0	0	0.045964352	186.0465116	23.25581395	800
764418	397383	3706340	0	0	0.045964352	186.0465116	23.25581395	800
764419	396583	3706340	0	0	0.045964352	186.0465116	23.25581395	800
764420	395783	3706340	0	0	0.045964352	186.0465116	23.25581395	800
764421	398983	3705540	0	0	0.045964352	186.0465116	23.25581395	800
764422	398183	3705540	0	0	0.045964352	186.0465116	23.25581395	800
764423	397383	3705540	0	0	0.045964352	186.0465116	23.25581395	800
764424	396583	3705540	0	0	0.045964352	186.0465116	23.25581395	800
764425	395783	3705540	0	0	0.045964352	186.0465116	23.25581395	800
764301	398983	3704740	0	0	0.045964352	186.0465116	23.25581395	800
764302	398183	3704740	0	0	0.045964352	186.0465116	23.25581395	800
764303	397383	3704740	0	0	0.045964352	186.0465116	23.25581395	800
764304	396583	3704740	0	0	0.045964352	186.0465116	23.25581395	800
764305	395783	3704740	0	0	0.045964352	186.0465116	23.25581395	800
764306	398983	3703940	0	0	0.045964352	186.0465116	23.25581395	800
764307	398183	3703940	0	0	0.045964352	186.0465116	23.25581395	800
764308	397383	3703940	0	0	0.045964352	186.0465116	23.25581395	800
764309	396583	3703940	0	0	0.045964352	186.0465116	23.25581395	800
764310	395783	3703940	0	0	0.045964352	186.0465116	23.25581395	800
764311	398983	3703140	0	0	0.045964352	186.0465116	23.25581395	800
764312	398183	3703140	0	0	0.045964352	186.0465116	23.25581395	800
764313	397383	3703140	0	0	0.045964352	186.0465116	23.25581395	800
764314	396583	3703140	0	0	0.045964352	186.0465116	23.25581395	800
764315	395783	3703140	0	0	0.045964352	186.0465116	23.25581395	800
764316	398983	3702340	0	0	0.045964352	186.0465116	23.25581395	800
764317	398183	3702340	0	0	0.045964352	186.0465116	23.25581395	800
764318	397383	3702340	0	0	0.045964352	186.0465116	23.25581395	800
764319	396583	3702340	0	0	0.045964352	186.0465116	23.25581395	800
764320	395783	3702340	0	0	0.045964352	186.0465116	23.25581395	800
764321	398983	3701540	0	0	0.045964352	186.0465116	23.25581395	800
764322	398183	3701540	0	0	0.045964352	186.0465116	23.25581395	800
764323	397383	3701540	0	0	0.045964352	186.0465116	23.25581395	800
764324	396583	3701540	0	0	0.045964352	186.0465116	23.25581395	800
764325	395783	3701540	0	0	0.045964352	186.0465116	23.25581395	800
764201	398983	3700740	0	0	0.045964352	186.0465116	23.25581395	800
764202	398183	3700740	0	0	0.045964352	186.0465116	23.25581395	800
764203	397383	3700740	0	0	0.045964352	186.0465116	23.25581395	800
764204	396583	3700740	0	0	0.045964352	186.0465116	23.25581395	800
764205	395783	3700740	0	0	0.045964352	186.0465116	23.25581395	800
764206	398983	3699940	0	0	0.045964352	186.0465116	23.25581395	800
764207	398183	3699940	0	0	0.045964352	186.0465116	23.25581395	800
764208	397383	3699940	0	0	0.045964352	186.0465116	23.25581395	800

Shipping Lanes

Source ID	UTM X (m)	UTM Y (m)	Base Elevation (m)	Height (m)	Emission Rate (g/s)	Sigma Y (m)	Sigma Z (m)	Length of Side (m)
764209	396583	3699940	0	0	0.045964352	186.0465116	23.25581395	800
764210	395783	3699940	0	0	0.045964352	186.0465116	23.25581395	800
764211	398983	3699140	0	0	0.045964352	186.0465116	23.25581395	800
764212	398183	3699140	0	0	0.045964352	186.0465116	23.25581395	800
764213	397383	3699140	0	0	0.045964352	186.0465116	23.25581395	800
764214	396583	3699140	0	0	0.045964352	186.0465116	23.25581395	800
764215	395783	3699140	0	0	0.045964352	186.0465116	23.25581395	800
764216	398983	3698340	0	0	0.045964352	186.0465116	23.25581395	800
764217	398183	3698340	0	0	0.045964352	186.0465116	23.25581395	800
764218	397383	3698340	0	0	0.045964352	186.0465116	23.25581395	800
764219	396583	3698340	0	0	0.045964352	186.0465116	23.25581395	800
764220	395783	3698340	0	0	0.045964352	186.0465116	23.25581395	800
764221	398983	3697540	0	0	0.045964352	186.0465116	23.25581395	800
764222	398183	3697540	0	0	0.045964352	186.0465116	23.25581395	800
764223	397383	3697540	0	0	0.045964352	186.0465116	23.25581395	800
764224	396583	3697540	0	0	0.045964352	186.0465116	23.25581395	800
764225	395783	3697540	0	0	0.045964352	186.0465116	23.25581395	800
754801	394983	3724740	0	0	0.018704167	186.0465116	23.25581395	800
754802	394183	3724740	0	0	0.018704167	186.0465116	23.25581395	800
754803	393383	3724740	0	0	0.018704167	186.0465116	23.25581395	800
754804	392583	3724740	0	0	0.018704167	186.0465116	23.25581395	800
754805	391783	3724740	0	0	0.018704167	186.0465116	23.25581395	800
754806	394983	3723940	0	0	0.018704167	186.0465116	23.25581395	800
754807	394183	3723940	0	0	0.018704167	186.0465116	23.25581395	800
754808	393383	3723940	0	0	0.018704167	186.0465116	23.25581395	800
754809	392583	3723940	0	0	0.018704167	186.0465116	23.25581395	800
754810	391783	3723940	0	0	0.018704167	186.0465116	23.25581395	800
754811	394983	3723140	0	0	0.018704167	186.0465116	23.25581395	800
754812	394183	3723140	0	0	0.018704167	186.0465116	23.25581395	800
754813	393383	3723140	0	0	0.018704167	186.0465116	23.25581395	800
754814	392583	3723140	0	0	0.018704167	186.0465116	23.25581395	800
754815	391783	3723140	0	0	0.018704167	186.0465116	23.25581395	800
754816	394983	3722340	0	0	0.018704167	186.0465116	23.25581395	800
754817	394183	3722340	0	0	0.018704167	186.0465116	23.25581395	800
754818	393383	3722340	0	0	0.018704167	186.0465116	23.25581395	800
754819	392583	3722340	0	0	0.018704167	186.0465116	23.25581395	800
754820	391783	3722340	0	0	0.018704167	186.0465116	23.25581395	800
754821	394983	3721540	0	0	0.018704167	186.0465116	23.25581395	800
754822	394183	3721540	0	0	0.018704167	186.0465116	23.25581395	800
754823	393383	3721540	0	0	0.018704167	186.0465116	23.25581395	800
754824	392583	3721540	0	0	0.018704167	186.0465116	23.25581395	800
754825	391783	3721540	0	0	0.018704167	186.0465116	23.25581395	800
754701	394983	3720740	0	0	0.029531481	186.0465116	23.25581395	800
754702	394183	3720740	0	0	0.029531481	186.0465116	23.25581395	800
754703	393383	3720740	0	0	0.029531481	186.0465116	23.25581395	800
754704	392583	3720740	0	0	0.029531481	186.0465116	23.25581395	800
754705	391783	3720740	0	0	0.029531481	186.0465116	23.25581395	800
754706	394983	3719940	0	0	0.029531481	186.0465116	23.25581395	800
754707	394183	3719940	0	0	0.029531481	186.0465116	23.25581395	800
754708	393383	3719940	0	0	0.029531481	186.0465116	23.25581395	800
754709	392583	3719940	0	0	0.029531481	186.0465116	23.25581395	800
754710	391783	3719940	0	0	0.029531481	186.0465116	23.25581395	800
754711	394983	3719140	0	0	0.029531481	186.0465116	23.25581395	800
754712	394183	3719140	0	0	0.029531481	186.0465116	23.25581395	800
754713	393383	3719140	0	0	0.029531481	186.0465116	23.25581395	800
754714	392583	3719140	0	0	0.029531481	186.0465116	23.25581395	800
754715	391783	3719140	0	0	0.029531481	186.0465116	23.25581395	800
754716	394983	3718340	0	0	0.029531481	186.0465116	23.25581395	800
754717	394183	3718340	0	0	0.029531481	186.0465116	23.25581395	800
754718	393383	3718340	0	0	0.029531481	186.0465116	23.25581395	800
754719	392583	3718340	0	0	0.029531481	186.0465116	23.25581395	800

Shipping Lanes

Source ID	UTM X (m)	UTM Y (m)	Base Elevation (m)	Height (m)	Emission Rate (g/s)	Sigma Y (m)	Sigma Z (m)	Length of Side (m)
754720	391783	3718340	0	0	0.029531481	186.0465116	23.25581395	800
754721	394983	3717540	0	0	0.029531481	186.0465116	23.25581395	800
754722	394183	3717540	0	0	0.029531481	186.0465116	23.25581395	800
754723	393383	3717540	0	0	0.029531481	186.0465116	23.25581395	800
754724	392583	3717540	0	0	0.029531481	186.0465116	23.25581395	800
754725	391783	3717540	0	0	0.029531481	186.0465116	23.25581395	800
754601	394983	3716740	0	0	0.010491204	186.0465116	23.25581395	800
754602	394183	3716740	0	0	0.010491204	186.0465116	23.25581395	800
754603	393383	3716740	0	0	0.010491204	186.0465116	23.25581395	800
754604	392583	3716740	0	0	0.010491204	186.0465116	23.25581395	800
754605	391783	3716740	0	0	0.010491204	186.0465116	23.25581395	800
754606	394983	3715940	0	0	0.010491204	186.0465116	23.25581395	800
754607	394183	3715940	0	0	0.010491204	186.0465116	23.25581395	800
754608	393383	3715940	0	0	0.010491204	186.0465116	23.25581395	800
754609	392583	3715940	0	0	0.010491204	186.0465116	23.25581395	800
754610	391783	3715940	0	0	0.010491204	186.0465116	23.25581395	800
754611	394983	3715140	0	0	0.010491204	186.0465116	23.25581395	800
754612	394183	3715140	0	0	0.010491204	186.0465116	23.25581395	800
754613	393383	3715140	0	0	0.010491204	186.0465116	23.25581395	800
754614	392583	3715140	0	0	0.010491204	186.0465116	23.25581395	800
754615	391783	3715140	0	0	0.010491204	186.0465116	23.25581395	800
754616	394983	3714340	0	0	0.010491204	186.0465116	23.25581395	800
754617	394183	3714340	0	0	0.010491204	186.0465116	23.25581395	800
754618	393383	3714340	0	0	0.010491204	186.0465116	23.25581395	800
754619	392583	3714340	0	0	0.010491204	186.0465116	23.25581395	800
754620	391783	3714340	0	0	0.010491204	186.0465116	23.25581395	800
754621	394983	3713540	0	0	0.010491204	186.0465116	23.25581395	800
754622	394183	3713540	0	0	0.010491204	186.0465116	23.25581395	800
754623	393383	3713540	0	0	0.010491204	186.0465116	23.25581395	800
754624	392583	3713540	0	0	0.010491204	186.0465116	23.25581395	800
754625	391783	3713540	0	0	0.010491204	186.0465116	23.25581395	800
754501	394983	3712740	0	0	0.020287037	186.0465116	23.25581395	800
754502	394183	3712740	0	0	0.020287037	186.0465116	23.25581395	800
754503	393383	3712740	0	0	0.020287037	186.0465116	23.25581395	800
754504	392583	3712740	0	0	0.020287037	186.0465116	23.25581395	800
754505	391783	3712740	0	0	0.020287037	186.0465116	23.25581395	800
754506	394983	3711940	0	0	0.020287037	186.0465116	23.25581395	800
754507	394183	3711940	0	0	0.020287037	186.0465116	23.25581395	800
754508	393383	3711940	0	0	0.020287037	186.0465116	23.25581395	800
754509	392583	3711940	0	0	0.020287037	186.0465116	23.25581395	800
754510	391783	3711940	0	0	0.020287037	186.0465116	23.25581395	800
754511	394983	3711140	0	0	0.020287037	186.0465116	23.25581395	800
754512	394183	3711140	0	0	0.020287037	186.0465116	23.25581395	800
754513	393383	3711140	0	0	0.020287037	186.0465116	23.25581395	800
754514	392583	3711140	0	0	0.020287037	186.0465116	23.25581395	800
754515	391783	3711140	0	0	0.020287037	186.0465116	23.25581395	800
754516	394983	3710340	0	0	0.020287037	186.0465116	23.25581395	800
754517	394183	3710340	0	0	0.020287037	186.0465116	23.25581395	800
754518	393383	3710340	0	0	0.020287037	186.0465116	23.25581395	800
754519	392583	3710340	0	0	0.020287037	186.0465116	23.25581395	800
754520	391783	3710340	0	0	0.020287037	186.0465116	23.25581395	800
754521	394983	3709540	0	0	0.020287037	186.0465116	23.25581395	800
754522	394183	3709540	0	0	0.020287037	186.0465116	23.25581395	800
754523	393383	3709540	0	0	0.020287037	186.0465116	23.25581395	800
754524	392583	3709540	0	0	0.020287037	186.0465116	23.25581395	800
754525	391783	3709540	0	0	0.020287037	186.0465116	23.25581395	800
754401	394983	3708740	0	0	0.036063426	186.0465116	23.25581395	800
754402	394183	3708740	0	0	0.036063426	186.0465116	23.25581395	800
754403	393383	3708740	0	0	0.036063426	186.0465116	23.25581395	800
754404	392583	3708740	0	0	0.036063426	186.0465116	23.25581395	800
754405	391783	3708740	0	0	0.036063426	186.0465116	23.25581395	800

Shipping Lanes

Source ID	UTM X (m)	UTM Y (m)	Base Elevation (m)	Height (m)	Emission Rate (g/s)	Sigma Y (m)	Sigma Z (m)	Length of Side (m)
754406	394983	3707940	0	0	0.036063426	186.0465116	23.25581395	800
754407	394183	3707940	0	0	0.036063426	186.0465116	23.25581395	800
754408	393383	3707940	0	0	0.036063426	186.0465116	23.25581395	800
754409	392583	3707940	0	0	0.036063426	186.0465116	23.25581395	800
754410	391783	3707940	0	0	0.036063426	186.0465116	23.25581395	800
754411	394983	3707140	0	0	0.036063426	186.0465116	23.25581395	800
754412	394183	3707140	0	0	0.036063426	186.0465116	23.25581395	800
754413	393383	3707140	0	0	0.036063426	186.0465116	23.25581395	800
754414	392583	3707140	0	0	0.036063426	186.0465116	23.25581395	800
754415	391783	3707140	0	0	0.036063426	186.0465116	23.25581395	800
754416	394983	3706340	0	0	0.036063426	186.0465116	23.25581395	800
754417	394183	3706340	0	0	0.036063426	186.0465116	23.25581395	800
754418	393383	3706340	0	0	0.036063426	186.0465116	23.25581395	800
754419	392583	3706340	0	0	0.036063426	186.0465116	23.25581395	800
754420	391783	3706340	0	0	0.036063426	186.0465116	23.25581395	800
754421	394983	3705540	0	0	0.036063426	186.0465116	23.25581395	800
754422	394183	3705540	0	0	0.036063426	186.0465116	23.25581395	800
754423	393383	3705540	0	0	0.036063426	186.0465116	23.25581395	800
754424	392583	3705540	0	0	0.036063426	186.0465116	23.25581395	800
754425	391783	3705540	0	0	0.036063426	186.0465116	23.25581395	800
754301	394983	3704740	0	0	0.028783333	186.0465116	23.25581395	800
754302	394183	3704740	0	0	0.028783333	186.0465116	23.25581395	800
754303	393383	3704740	0	0	0.028783333	186.0465116	23.25581395	800
754304	392583	3704740	0	0	0.028783333	186.0465116	23.25581395	800
754305	391783	3704740	0	0	0.028783333	186.0465116	23.25581395	800
754306	394983	3703940	0	0	0.028783333	186.0465116	23.25581395	800
754307	394183	3703940	0	0	0.028783333	186.0465116	23.25581395	800
754308	393383	3703940	0	0	0.028783333	186.0465116	23.25581395	800
754309	392583	3703940	0	0	0.028783333	186.0465116	23.25581395	800
754310	391783	3703940	0	0	0.028783333	186.0465116	23.25581395	800
754311	394983	3703140	0	0	0.028783333	186.0465116	23.25581395	800
754312	394183	3703140	0	0	0.028783333	186.0465116	23.25581395	800
754313	393383	3703140	0	0	0.028783333	186.0465116	23.25581395	800
754314	392583	3703140	0	0	0.028783333	186.0465116	23.25581395	800
754315	391783	3703140	0	0	0.028783333	186.0465116	23.25581395	800
754316	394983	3702340	0	0	0.028783333	186.0465116	23.25581395	800
754317	394183	3702340	0	0	0.028783333	186.0465116	23.25581395	800
754318	393383	3702340	0	0	0.028783333	186.0465116	23.25581395	800
754319	392583	3702340	0	0	0.028783333	186.0465116	23.25581395	800
754320	391783	3702340	0	0	0.028783333	186.0465116	23.25581395	800
754321	394983	3701540	0	0	0.028783333	186.0465116	23.25581395	800
754322	394183	3701540	0	0	0.028783333	186.0465116	23.25581395	800
754323	393383	3701540	0	0	0.028783333	186.0465116	23.25581395	800
754324	392583	3701540	0	0	0.028783333	186.0465116	23.25581395	800
754325	391783	3701540	0	0	0.028783333	186.0465116	23.25581395	800
744801	390983	3724740	0	0	0.137901389	186.0465116	23.25581395	800
744802	390183	3724740	0	0	0.137901389	186.0465116	23.25581395	800
744803	389383	3724740	0	0	0.137901389	186.0465116	23.25581395	800
744804	388583	3724740	0	0	0.137901389	186.0465116	23.25581395	800
744805	387783	3724740	0	0	0.137901389	186.0465116	23.25581395	800
744806	390983	3723940	0	0	0.137901389	186.0465116	23.25581395	800
744807	390183	3723940	0	0	0.137901389	186.0465116	23.25581395	800
744808	389383	3723940	0	0	0.137901389	186.0465116	23.25581395	800
744809	388583	3723940	0	0	0.137901389	186.0465116	23.25581395	800
744810	387783	3723940	0	0	0.137901389	186.0465116	23.25581395	800
744811	390983	3723140	0	0	0.137901389	186.0465116	23.25581395	800
744812	390183	3723140	0	0	0.137901389	186.0465116	23.25581395	800
744813	389383	3723140	0	0	0.137901389	186.0465116	23.25581395	800
744814	388583	3723140	0	0	0.137901389	186.0465116	23.25581395	800
744815	387783	3723140	0	0	0.137901389	186.0465116	23.25581395	800
744816	390983	3722340	0	0	0.137901389	186.0465116	23.25581395	800

Shipping Lanes

Source ID	UTM X (m)	UTM Y (m)	Base Elevation (m)	Height (m)	Emission Rate (g/s)	Sigma Y (m)	Sigma Z (m)	Length of Side (m)
744817	390183	3722340	0	0	0.137901389	186.0465116	23.25581395	800
744818	389383	3722340	0	0	0.137901389	186.0465116	23.25581395	800
744819	388583	3722340	0	0	0.137901389	186.0465116	23.25581395	800
744820	387783	3722340	0	0	0.137901389	186.0465116	23.25581395	800
744821	390983	3721540	0	0	0.137901389	186.0465116	23.25581395	800
744822	390183	3721540	0	0	0.137901389	186.0465116	23.25581395	800
744823	389383	3721540	0	0	0.137901389	186.0465116	23.25581395	800
744824	388583	3721540	0	0	0.137901389	186.0465116	23.25581395	800
744825	387783	3721540	0	0	0.137901389	186.0465116	23.25581395	800
744701	390983	3720740	0	0	0.021778241	186.0465116	23.25581395	800
744702	390183	3720740	0	0	0.021778241	186.0465116	23.25581395	800
744703	389383	3720740	0	0	0.021778241	186.0465116	23.25581395	800
744704	388583	3720740	0	0	0.021778241	186.0465116	23.25581395	800
744705	387783	3720740	0	0	0.021778241	186.0465116	23.25581395	800
744706	390983	3719940	0	0	0.021778241	186.0465116	23.25581395	800
744707	390183	3719940	0	0	0.021778241	186.0465116	23.25581395	800
744708	389383	3719940	0	0	0.021778241	186.0465116	23.25581395	800
744709	388583	3719940	0	0	0.021778241	186.0465116	23.25581395	800
744710	387783	3719940	0	0	0.021778241	186.0465116	23.25581395	800
744711	390983	3719140	0	0	0.021778241	186.0465116	23.25581395	800
744712	390183	3719140	0	0	0.021778241	186.0465116	23.25581395	800
744713	389383	3719140	0	0	0.021778241	186.0465116	23.25581395	800
744714	388583	3719140	0	0	0.021778241	186.0465116	23.25581395	800
744715	387783	3719140	0	0	0.021778241	186.0465116	23.25581395	800
744716	390983	3718340	0	0	0.021778241	186.0465116	23.25581395	800
744717	390183	3718340	0	0	0.021778241	186.0465116	23.25581395	800
744718	389383	3718340	0	0	0.021778241	186.0465116	23.25581395	800
744719	388583	3718340	0	0	0.021778241	186.0465116	23.25581395	800
744720	387783	3718340	0	0	0.021778241	186.0465116	23.25581395	800
744721	390983	3717540	0	0	0.021778241	186.0465116	23.25581395	800
744722	390183	3717540	0	0	0.021778241	186.0465116	23.25581395	800
744723	389383	3717540	0	0	0.021778241	186.0465116	23.25581395	800
744724	388583	3717540	0	0	0.021778241	186.0465116	23.25581395	800
744725	387783	3717540	0	0	0.021778241	186.0465116	23.25581395	800
744601	390983	3716740	0	0	0.034164815	186.0465116	23.25581395	800
744602	390183	3716740	0	0	0.034164815	186.0465116	23.25581395	800
744603	389383	3716740	0	0	0.034164815	186.0465116	23.25581395	800
744604	388583	3716740	0	0	0.034164815	186.0465116	23.25581395	800
744605	387783	3716740	0	0	0.034164815	186.0465116	23.25581395	800
744606	390983	3715940	0	0	0.034164815	186.0465116	23.25581395	800
744607	390183	3715940	0	0	0.034164815	186.0465116	23.25581395	800
744608	389383	3715940	0	0	0.034164815	186.0465116	23.25581395	800
744609	388583	3715940	0	0	0.034164815	186.0465116	23.25581395	800
744610	387783	3715940	0	0	0.034164815	186.0465116	23.25581395	800
744611	390983	3715140	0	0	0.034164815	186.0465116	23.25581395	800
744612	390183	3715140	0	0	0.034164815	186.0465116	23.25581395	800
744613	389383	3715140	0	0	0.034164815	186.0465116	23.25581395	800
744614	388583	3715140	0	0	0.034164815	186.0465116	23.25581395	800
744615	387783	3715140	0	0	0.034164815	186.0465116	23.25581395	800
744616	390983	3714340	0	0	0.034164815	186.0465116	23.25581395	800
744617	390183	3714340	0	0	0.034164815	186.0465116	23.25581395	800
744618	389383	3714340	0	0	0.034164815	186.0465116	23.25581395	800
744619	388583	3714340	0	0	0.034164815	186.0465116	23.25581395	800
744620	387783	3714340	0	0	0.034164815	186.0465116	23.25581395	800
744621	390983	3713540	0	0	0.034164815	186.0465116	23.25581395	800
744622	390183	3713540	0	0	0.034164815	186.0465116	23.25581395	800
744623	389383	3713540	0	0	0.034164815	186.0465116	23.25581395	800
744624	388583	3713540	0	0	0.034164815	186.0465116	23.25581395	800
744625	387783	3713540	0	0	0.034164815	186.0465116	23.25581395	800
744501	390983	3712740	0	0	0.015778704	186.0465116	23.25581395	800
744502	390183	3712740	0	0	0.015778704	186.0465116	23.25581395	800

Shipping Lanes

Source ID	UTM X (m)	UTM Y (m)	Base Elevation (m)	Height (m)	Emission Rate (g/s)	Sigma Y (m)	Sigma Z (m)	Length of Side (m)
744503	389383	3712740	0	0	0.015778704	186.0465116	23.25581395	800
744504	388583	3712740	0	0	0.015778704	186.0465116	23.25581395	800
744505	387783	3712740	0	0	0.015778704	186.0465116	23.25581395	800
744506	390983	3711940	0	0	0.015778704	186.0465116	23.25581395	800
744507	390183	3711940	0	0	0.015778704	186.0465116	23.25581395	800
744508	389383	3711940	0	0	0.015778704	186.0465116	23.25581395	800
744509	388583	3711940	0	0	0.015778704	186.0465116	23.25581395	800
744510	387783	3711940	0	0	0.015778704	186.0465116	23.25581395	800
744511	390983	3711140	0	0	0.015778704	186.0465116	23.25581395	800
744512	390183	3711140	0	0	0.015778704	186.0465116	23.25581395	800
744513	389383	3711140	0	0	0.015778704	186.0465116	23.25581395	800
744514	388583	3711140	0	0	0.015778704	186.0465116	23.25581395	800
744515	387783	3711140	0	0	0.015778704	186.0465116	23.25581395	800
744516	390983	3710340	0	0	0.015778704	186.0465116	23.25581395	800
744517	390183	3710340	0	0	0.015778704	186.0465116	23.25581395	800
744518	389383	3710340	0	0	0.015778704	186.0465116	23.25581395	800
744519	388583	3710340	0	0	0.015778704	186.0465116	23.25581395	800
744520	387783	3710340	0	0	0.015778704	186.0465116	23.25581395	800
744521	390983	3709540	0	0	0.015778704	186.0465116	23.25581395	800
744522	390183	3709540	0	0	0.015778704	186.0465116	23.25581395	800
744523	389383	3709540	0	0	0.015778704	186.0465116	23.25581395	800
744524	388583	3709540	0	0	0.015778704	186.0465116	23.25581395	800
744525	387783	3709540	0	0	0.015778704	186.0465116	23.25581395	800
734801	386983	3724740	0	0	0.177289815	186.0465116	23.25581395	800
734802	386183	3724740	0	0	0.177289815	186.0465116	23.25581395	800
734803	385383	3724740	0	0	0.177289815	186.0465116	23.25581395	800
734804	384583	3724740	0	0	0.177289815	186.0465116	23.25581395	800
734805	383783	3724740	0	0	0.177289815	186.0465116	23.25581395	800
734806	386983	3723940	0	0	0.177289815	186.0465116	23.25581395	800
734807	386183	3723940	0	0	0.177289815	186.0465116	23.25581395	800
734808	385383	3723940	0	0	0.177289815	186.0465116	23.25581395	800
734809	384583	3723940	0	0	0.177289815	186.0465116	23.25581395	800
734810	383783	3723940	0	0	0.177289815	186.0465116	23.25581395	800
734811	386983	3723140	0	0	0.177289815	186.0465116	23.25581395	800
734812	386183	3723140	0	0	0.177289815	186.0465116	23.25581395	800
734813	385383	3723140	0	0	0.177289815	186.0465116	23.25581395	800
734814	384583	3723140	0	0	0.177289815	186.0465116	23.25581395	800
734815	383783	3723140	0	0	0.177289815	186.0465116	23.25581395	800
734816	386983	3722340	0	0	0.177289815	186.0465116	23.25581395	800
734817	386183	3722340	0	0	0.177289815	186.0465116	23.25581395	800
734818	385383	3722340	0	0	0.177289815	186.0465116	23.25581395	800
734819	384583	3722340	0	0	0.177289815	186.0465116	23.25581395	800
734820	383783	3722340	0	0	0.177289815	186.0465116	23.25581395	800
734821	386983	3721540	0	0	0.177289815	186.0465116	23.25581395	800
734822	386183	3721540	0	0	0.177289815	186.0465116	23.25581395	800
734823	385383	3721540	0	0	0.177289815	186.0465116	23.25581395	800
734824	384583	3721540	0	0	0.177289815	186.0465116	23.25581395	800
734825	383783	3721540	0	0	0.177289815	186.0465116	23.25581395	800
734701	386983	3720740	0	0	0.126575463	186.0465116	23.25581395	800
734702	386183	3720740	0	0	0.126575463	186.0465116	23.25581395	800
734703	385383	3720740	0	0	0.126575463	186.0465116	23.25581395	800
734704	384583	3720740	0	0	0.126575463	186.0465116	23.25581395	800
734705	383783	3720740	0	0	0.126575463	186.0465116	23.25581395	800
734706	386983	3719940	0	0	0.126575463	186.0465116	23.25581395	800
734707	386183	3719940	0	0	0.126575463	186.0465116	23.25581395	800
734708	385383	3719940	0	0	0.126575463	186.0465116	23.25581395	800
734709	384583	3719940	0	0	0.126575463	186.0465116	23.25581395	800
734710	383783	3719940	0	0	0.126575463	186.0465116	23.25581395	800
734711	386983	3719140	0	0	0.126575463	186.0465116	23.25581395	800
734712	386183	3719140	0	0	0.126575463	186.0465116	23.25581395	800
734713	385383	3719140	0	0	0.126575463	186.0465116	23.25581395	800

Shipping Lanes

Source ID	UTM X (m)	UTM Y (m)	Base Elevation (m)	Height (m)	Emission Rate (g/s)	Sigma Y (m)	Sigma Z (m)	Length of Side (m)
734714	384583	3719140	0	0	0.126575463	186.0465116	23.25581395	800
734715	383783	3719140	0	0	0.126575463	186.0465116	23.25581395	800
734716	386983	3718340	0	0	0.126575463	186.0465116	23.25581395	800
734717	386183	3718340	0	0	0.126575463	186.0465116	23.25581395	800
734718	385383	3718340	0	0	0.126575463	186.0465116	23.25581395	800
734719	384583	3718340	0	0	0.126575463	186.0465116	23.25581395	800
734720	383783	3718340	0	0	0.126575463	186.0465116	23.25581395	800
734721	386983	3717540	0	0	0.126575463	186.0465116	23.25581395	800
734722	386183	3717540	0	0	0.126575463	186.0465116	23.25581395	800
734723	385383	3717540	0	0	0.126575463	186.0465116	23.25581395	800
734724	384583	3717540	0	0	0.126575463	186.0465116	23.25581395	800
734725	383783	3717540	0	0	0.126575463	186.0465116	23.25581395	800
734601	386983	3716740	0	0	0.003936574	186.0465116	23.25581395	800
734602	386183	3716740	0	0	0.003936574	186.0465116	23.25581395	800
734603	385383	3716740	0	0	0.003936574	186.0465116	23.25581395	800
734604	384583	3716740	0	0	0.003936574	186.0465116	23.25581395	800
734605	383783	3716740	0	0	0.003936574	186.0465116	23.25581395	800
734606	386983	3715940	0	0	0.003936574	186.0465116	23.25581395	800
734607	386183	3715940	0	0	0.003936574	186.0465116	23.25581395	800
734608	385383	3715940	0	0	0.003936574	186.0465116	23.25581395	800
734609	384583	3715940	0	0	0.003936574	186.0465116	23.25581395	800
734610	383783	3715940	0	0	0.003936574	186.0465116	23.25581395	800
734611	386983	3715140	0	0	0.003936574	186.0465116	23.25581395	800
734612	386183	3715140	0	0	0.003936574	186.0465116	23.25581395	800
734613	385383	3715140	0	0	0.003936574	186.0465116	23.25581395	800
734614	384583	3715140	0	0	0.003936574	186.0465116	23.25581395	800
734615	383783	3715140	0	0	0.003936574	186.0465116	23.25581395	800
734616	386983	3714340	0	0	0.003936574	186.0465116	23.25581395	800
734617	386183	3714340	0	0	0.003936574	186.0465116	23.25581395	800
734618	385383	3714340	0	0	0.003936574	186.0465116	23.25581395	800
734619	384583	3714340	0	0	0.003936574	186.0465116	23.25581395	800
734620	383783	3714340	0	0	0.003936574	186.0465116	23.25581395	800
734621	386983	3713540	0	0	0.003936574	186.0465116	23.25581395	800
734622	386183	3713540	0	0	0.003936574	186.0465116	23.25581395	800
734623	385383	3713540	0	0	0.003936574	186.0465116	23.25581395	800
734624	384583	3713540	0	0	0.003936574	186.0465116	23.25581395	800
734625	383783	3713540	0	0	0.003936574	186.0465116	23.25581395	800

Attachment 4
HBEP Cumulative Impact Assessment

Huntington Beach Energy Project
Attachment 4 Table 1
Cumulative Modeling Parameters - Stack Parameters
October 2013

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	Stack 1	409185	3723252	3.7	36.6	461	15.4	5.49
	Stack 2	409216	3723231	3.7	36.6	461	15.4	5.49
	Stack 3	409245	3723210	3.7	36.6	461	15.4	5.49
	Stack 4	409522	3723157	3.7	36.6	461	15.4	5.49
	Stack 5	409522	3723194	3.7	36.6	461	15.4	5.49
	Stack 6	409522	3723230	3.7	36.6	461	15.4	5.49
HBGS	Boilers 1 & 2	409274	3723095	3.7	61.0	367	7.9	6.27
OC Sanitation - FV	OCSFV 1730101	412962	3728359	8.0	7.4	1089	1.37	2.23
	OCSFV 1730102	412914	3728328	7.7	7.6	475	7.03	0.55
	OCSFV 1730103	412935	3728401	8.0	18.9	533	17.9	0.76
	OCSFV 1730104	412942	3728391	8.0	18.9	533	17.9	0.76
	OCSFV 1730105	412939	3728396	8.0	18.9	533	17.9	0.76
OC Sanitation - HB	OCSHB 2911001	411071	3722313	1.6	7.6	475	7.44	0.53
	OCSHB 2911002	411096	3722214	1.6	7.4	1089	1.37	0.68
	OCSHB 2911003	411240	3722455	1.6	18.0	589	22.9	0.76
	OCSHB 2911004	411248	3722455	1.6	18.0	589	22.9	0.76
	OCSHB 2911005	411255	3722455	1.6	18.0	589	22.9	0.76
	OCSHB 2911006	411263	3722455	1.6	18.0	589	22.9	0.76
	OCSHB 2911007	411270	3722455	1.6	18.0	589	22.9	0.76
Beta Offshore	Beta 16607301	395222	3716431	0.0	18.3	661	31.1	0.30
	Beta 16607302	395222	3716431	0.0	18.3	641	30.0	0.30
	Beta 16607303	395222	3716431	0.0	18.3	585	24.2	0.30
	Beta 16607304	394082	3717932	0.0	18.3	663	28.7	0.30
	Beta 16607305	394082	3717932	0.0	18.3	684	34.7	0.30
	Beta 16607306	394082	3717932	0.0	18.3	583	21.1	0.30
	Beta 16607307	395265	3716554	0.0	18.3	671	39.4	0.61
	Beta 16607308	395265	3716554	0.0	18.3	671	38.1	0.61
	Beta 16607309	395265	3716554	0.0	18.3	677	37.5	0.61
	Beta 16607310	395265	3716554	0.0	18.3	671	81.2	0.76
	Beta 16607311	395265	3716554	0.0	18.3	669	81.1	0.76
	Beta 16607312	395265	3716554	0.0	18.3	668	81.4	0.76
	Beta 16607313	395265	3716554	0.0	22.9	464	8.3	0.51

Volume Sources

Facility	Source ID	Base Elevation (m)	Stack Height (m)	Initial Horizontal Dimension (m)	Initial Vertical Dimension (m)
Shipping Lanes (525 sources)	734601-774425	0.0	0.0	186.0	23.3

Huntington Beach Energy Project
Attachment 4 Table 2
Cumulative Modeling Parameters - Emission Rates
October2013

Facility	Source ID	1-hr NO_2 (g/s)	1-hr NO_2 (lb/hr)
HBEP	Stack 1	3.21	25.5
	Stack 2	3.21	25.5
	Stack 3	3.21	25.5
	Stack 4	3.21	25.5
	Stack 5	3.21	25.5
	Stack 6	3.21	25.5
HBGS	Boilers 1 & 2	4.32	34.3
OC Sanitation - FV	OCSFV 1730101	0.65	5.17
	OCSFV 1730102	0.01	0.08
	OCSFV 1730103	0.98	7.79
	OCSFV 1730104	0.98	7.79
	OCSFV 1730105	0.98	7.79
OC Sanitation - HB	OCSHB 2911001	0.08	0.60
	OCSHB 2911002	0.11	0.90
	OCSHB 2911003	0.87	6.90
	OCSHB 2911004	0.87	6.90
	OCSHB 2911005	0.87	6.90
	OCSHB 2911006	0.87	6.90
	OCSHB 2911007	0.87	6.90
Beta Offshore	Beta 16607301	1.90	15.0
	Beta 16607302	1.90	15.0
	Beta 16607303	1.90	15.0
	Beta 16607304	1.90	15.0
	Beta 16607305	1.90	15.0
	Beta 16607306	1.90	15.0
	Beta 16607307	0.37	2.90
	Beta 16607308	0.31	2.50
	Beta 16607309	0.35	2.80
	Beta 16607310	2.52	20.0
	Beta 16607311	2.48	19.7
	Beta 16607312	2.48	19.7
	Beta 16607313	10.28	81.6
Shipping Lanes (525 sources)	734601-774425	25.47	202.2

Huntington Beach Energy Project
Attachment 4 Table 3
Cumulative Modeling Results Summary
October 2013

Source Group	Year	1-hr NO_2 Concentrations
ALL	2008	163
	2009	160
	2010	155
	2011	166
	2012	167
HBEP	2008	44.4
	2009	37.5
	2010	45.8
	2011	45.5
	2012	43.4
HBGS	2008	10.3
	2009	11.3
	2010	37.8
	2011	11.6
	2012	9.68
OC Sanitation - FV	2008	8.79
	2009	8.89
	2010	8.86
	2011	8.82
	2012	8.79
OC Sanitation - HB	2008	60.2
	2009	59.6
	2010	59.4
	2011	60.3
	2012	59.2
Beta Offshore	2008	61.9
	2009	65.1
	2010	64.7
	2011	64.8
	2012	65.6
Shipping Lanes	2008	25.7
	2009	26.2
	2010	28.1
	2011	25.7
	2012	25.7

[a] The maximum 1-hour NO_2 concentrations include ambient NO_2 ratios of 0.80.
[b] Total predicted concentration for the Federal 1-hour NO_2 standard (source ALL) is the maximum modeled concentration paired with the three-year average of 98th percentile seasonal hourly background concentrations, as provided by the SCAQMD.

Attachment 5
HBEP Class II Visibility Assessment

AES Huntington Beach Energy Project Class II Visibility Assessment

PREPARED FOR: AES Huntington Beach, LLC

COPY TO: CH2M HILL Project Folder

PREPARED BY: John Frohning/CH2M HILL

DATE: October 18, 2013

AES Huntington Beach, LLC (AES) owns and operates the Huntington Beach Generating Station located in Huntington Beach, California and is proposing to replace the existing power boilers with more efficient natural gas-fired combustion turbines in a combined cycle configuration. The proposed Huntington Beach Energy Project (HBEP) would be one of the 28 major source categories defined in Title 40 of the Code of Federal Regulations (CFR), Section 51.166, and the modification would trigger Prevention of Significant Deterioration (PSD) permitting requirements.

The South Coast Air Quality Management District (SCAQMD) is a responsible agency with regards to the permitting of HBEP. In addition to the information needed to satisfy the requirements for a complete PSD permit application, the SCAQMD has requested an analysis of the project's impacts on visibility for nearby Class II areas. This memorandum outlines the HBEP visibility analysis approach and results at the Class II areas of concern identified through consultation with SCAQMD.

Class II Areas of Concern

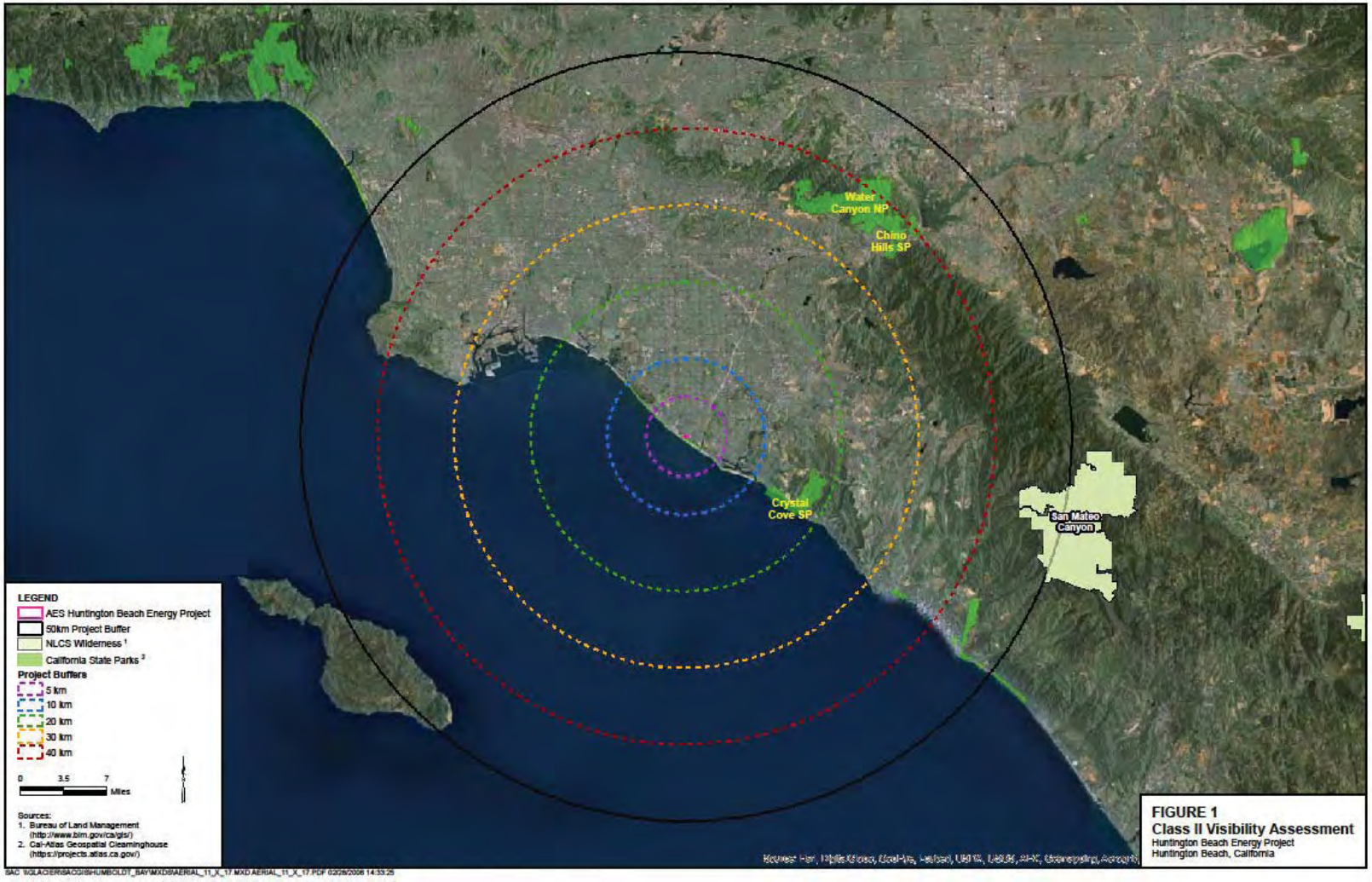
A survey of California State Parks and Wilderness areas designated as Class II areas was conducted within 50 kilometers (km) of HBEP. The results of this survey were presented to the SCAQMD staff for review and approval. The Class II areas identified and approved by the SCAQAMD for inclusion in the Class II visibility analysis are presented in Table 1 below and shown on Figure 1.

TABLE 1

Class II Areas within 50 km of HBEP

Class II Area	Nearest Distance	Furthest Distance
Crystal Cove State Park	12.5	18.4
Water Canyon State Park	33.6	42.9
Chino Hills State Park	35.8	41.6
San Mateo Canyon Wilderness Area	44.3	57.6

FIGURE 1
Class II Areas within 50 km of HBEP



Visibility Assessment Approach

No specific requirements or criteria exist in the PSD regulations for assessing Class II visibility impacts. Therefore, the conservative approach used to assess visibility impacts of Class I areas within 50 km of a PSD project site was used.

The *Federal Land Managers' Air Quality Related Values Workgroup (FLAG) Phase I Report – Revised (2010)* (Federal Land Managers [FLM], 2010) guidance document for addressing Class I areas initially recommends the use of the U.S Environmental Protection Agency's (EPA) VISCREEN screening model to assess the change in color difference (ΔE) and contrast between the facility's plume and the viewing background. The VISCREEN screening model can use a tiered approach to determine if the facility's emissions would impact visibility at a nearby Class I area. If the VISCREEN Tier I and Tier II screening assessment demonstrate that visibility could be impacted at the Class I area, then the PLUVUE II model is recommended for a Tier III assessment. The PLUVUE II model differs from the VISCREEN screening model as VISCREEN uses a single representative worst-case meteorological condition to determine the facility's potential impacts on visibility while PLUVUE II considers a realistic array of all conditions that would be expected to occur in a typical year in the region. Procedures outlined in the *Workbook for Plume Visual Impact Screening and Analysis* (EPA, 1992) were followed to conduct a visibility assessment with VISCREEN at the nearby Class II areas.

The VISCREEN screening model was developed to present a visual effect evaluation of emissions from a source as observed from a given vantage point on either a sky or terrain background. Emissions input into the model are assumed to travel along an infinitely long, straight line toward the specified area of concern. As mentioned above, the VISCREEN screening model allows for the use of a tiered approach to assess a proposed source's impacts on visibility. A Tier I assessment utilizes conservative assumptions for both plume characteristics and dispersion conditions to determine if the plume would have an impact on visibility. If a Tier I assessment exceeds the FLAG guidance levels of concern for Class I areas of 2.0 for ΔE and 0.05 for contrast, then a Tier II assessment would be conducted. A Tier II assessment provides a more realistic representation of the possible worst-case meteorology and plume transport for a specific area to be analyzed.

Background visual ranges for the Class II areas presented in Table 1 were selected from the Interagency Monitoring of Protected Visual Environments (IMPROVE) annual average background visual range map. These data are provided on the IMPROVE website[1]. The average of the annual upper and lower bounds of the background visual range for the identified Class II areas was used for the analysis.

For HBEP, if a VISCREEN Tier I assessment exceeded the conservative criteria for Class I areas for either ΔE or contrast, a Tier II assessment utilized the John Wayne Airport AERMET meteorological dataset, which was approved by SCAQMD staff for the PSD modeling analysis for years 2008 through 2012, to determine representative worst-case single combinations of wind speed, wind direction, and atmospheric stability for each Class II area above the screening criteria. The 5-years of John Wayne Airport meteorological data were pre-processed with the EPA Meteorological Processor for Regulatory Modeling Applications (MPRM, Version 99349) for the Industrial Source Complex (ISC) modeling system. These data, pre-processed with MPRM, contain the required parameters of wind speed, wind direction, and stability class to create the joint frequency distributions[2]. These meteorological data would be considered representative for creating the joint frequency tables for determining the conservative representative worst-case single wind speed and stability class required for a Class I area VISCREEN assessment.

The meteorological data processing utilized the SCAQMD-approved AERMET data for wind speed, wind direction, and temperature. These data were used since AERMET was pre-processed with the 1-minute automated surface observational system (ASOS) data. The cloud cover and ceiling height data were from the raw integrated surface hourly (ISH) format from the National Weather Service (NWS). The meteorological data processed with MPRM

[1] http://www2.nature.nps.gov/air/monitoring/vismonresults.cfm. Accessed June 15, 2013.

[2] Meteorological data processed for ISC is preferred to create the joint frequency distribution tables for a Tier II VISCREEN assessment since the data contain Pasquill-Gifford Stability Classes. Meteorological data pre-processed for AERMOD do not contain the Pasquill-Gifford stability parameters.

would be representative of the Class II area VISCREEN assessment. These parameters are required to create the corresponding hourly Pasquill-Gifford stability classes (EPA, 1996).

Additionally, considering that worst-case visibility impacts would occur during daylight hours, the joint frequency distribution only considered daylight hours. Daylight hours were conservatively considered to be between the hours of 6:00 a.m. and 8:00 p.m., which correspond to the sunrise and sunset times for the summer solstice. The meteorological data joint frequency distribution of these parameters for each Class II area requiring a Tier II assessment is provided in Attachment A.

Since the annual average background visual ranges for each Class II area was used, the annual average HBEP emissions in tons per year (tpy) were used for oxides of nitrogen (NOx) and total particulate matter (PM). The assessment conservatively assumes only the project increases in emissions from HBEP would be modeled and would not consider any contemporaneous decreases of these pollutants from removal of the existing Huntington Beach Generating Station Units 1 and 2 boilers. The HBEP potential to emit are 242.3 tpy of NOx and 99.3 tpy of PM.

Visibility Assessment Results

Following the approach above, Table 2 summarizes the VISCREEN Tier I modeled results for each Class II area shown in Table 1. The maximum modeled values for ΔE and contrast are presented for inside the area analyzed, regardless of the VISCREEN modeled lines of sight for the observer.

TABLE 2

Tier I VISCREEN Results

Class II Area	Minimum Distance	Maximum Distance	Variable	Sky	Terrain	Criteria
Crystal Cove State Park	12.5	18.4	Delta E	**3.961**	**7.476**	2.0
			Contrast	-0.041	0.042	|0.05|
Water Canyon State Park	33.6	42.9	Delta E	1.732	**2.326**	2.0
			Contrast	-0.018	0.021	|0.05|
Chino Hills State Park	35.8	41.6	Delta E	1.437	1.612	2.0
			Contrast	-0.015	0.017	|0.05|
San Mateo Canyon Wilderness Area	44.3	57.6	Delta E	1.083	1.564	2.0
			Contrast	0.011	0.015	|0.05|

Bold Values exceed the Class I significant impact criteria.

As shown in Table 2, the results of the Tier I assessment demonstrate that the proposed HBEP would be below the significance criteria for both ΔE and contrast at Chino Hills State Park and San Mateo Canyon Wilderness Area. The Tier I assessment exceeded the criteria for ΔE at Crystal Cove State Park and Water Canyon State Park. As a result, a Tier II assessment was performed for the Crystal Cove State Park and Water Canyon State Park. The Tier II VISCREEN results are summarized in Table 3.

TABLE 3

Tier 2 VISCREEN Results

Class II Area	Minimum Distance	Maximum Distance	Wind Speed [a]	Stability [a]	Variable	Sky	Terrain	Criteria
Crystal Cove State Park	12.5	18.4	4	D	Delta E	0.319	0.687	2.0
					Contrast	0.003	0.004	|0.05|
Water Canyon State Park	33.6	42.9	3	F	Delta E	0.586	0.797	2.0
					Contrast	0.006	0.007	|0.05|

[a] The Joint Frequency Distribution table used to calculate the wind speed and stability for the Tier II assessment is presented in Attachment A.

The VISCREEN Tier II assessment for Crystal Cove State Park and Water Canyon State Park did not exceed the criteria for ΔE or contrast. As the modeled results are below the conservative Class I area criteria for both ΔE and contrast, HBEP would not adversely affect visibility at nearby Class II areas.

References

U.S. Environmental Protection Agency (EPA). 1992. *Workbook for Plume Visual Impact Screening and Analysis* (EPA-454/R-92-023). October.

U.S. Environmental Protection Agency (EPA). 1996. *Meteorological Processor for Regulatory Models (MPRM) User's Guide*. Office of Air Quality Planning and Standards. Research Triangle Park. EPA-454/B-96-002. August.

Federal Land Managers (FLM). 2010. *Federal Land Managers' Air Quality Related Values Work Group (FLAG) Phase I Report – Revised (2010), Natural Resource Report NPS/NRPC/NRR-2010/232*. October.

Interagency Monitoring of Protected Visual Environments (IMPROVE). 2013. *Visibility Monitoring Data, Results*. http://www2.nature.nps.gov/air/monitoring/vismonresults.cfm. Accessed June 15.

Attachment A

Joint Frequency Distributions for Tier II VISCREEN Assessment

Table A-1
Crystal Cove State Park Joint Frequency Distribution

Dispersion Condition		σz·σy·u [a]	Transport Time (hours)	Count (hours) [b]	Frequency	Cumulative Frequency
Stability	Wind Speed					
F	1	1.68E+04	3.5	0	0	0
F	2	3.36E+04	1.7	39	0.001423	0.001423
E	1	4.36E+04	3.5	0	0	0.001423
F	3	5.04E+04	1.2	9	0.000328	0.001752
F	4	6.73E+04	0.9	0	0	0.001752
E	2	8.71E+04	1.7	49	0.001788	0.00354
D	1	1.01E+05	3.5	0	0	0.00354
E	3	1.31E+05	1.2	10	0.000365	0.003904
E	4	1.74E+05	0.9	4	0.000146	0.00405
D	2	2.03E+05	1.7	59	0.002153	0.006203
E	5	2.18E+05	0.7	0	0	0.006203
D	3	3.04E+05	1.2	25	0.000912	0.007115
D	4	4.06E+05	0.9	16	0.000584	0.007699

[a] σz·σy·u is based on a distance of 12.5 km.

[b] Count is for hours during which winds blow toward the sector between 103 and 125 degrees from true north during daylight hours, which are defined as between 6:00 a.m. and 8:00 p.m. The highlighted row conservatively represents the top 1 percent of the data; the corresponding wind speed and stability were used for the Tier II analysis.

Table A-2
Water Canyon State Park Joint Frequency Distribution

Dispersion Condition		σz·σy·u [a]	Transport Time (hours)	Count (hours) [b]	Frequency	Cumulative Frequency
Stability	Wind Speed					
F	1	1.89E+05	9.3	0	0	0
F	2	3.78E+05	4.7	157	0.005729	0.005729
F	3	5.66E+05	3.1	165	0.006021	0.01175
E	1	5.67E+05	9.3	0	0	0.01175
E	2	1.13 E+06	4.7	87	0.003175	0.014924
E	3	1.70 E+06	3.1		0	0.014924
D	1	1.89 E+06	9.3	0	0	0.014924
E	4	2.27 E+06	2.3	185	0.006751	0.021675
E	5	2.84 E+06	1.9	83	0.003029	0.024704
D	2	3.78 E+06	4.7	158	0.005765	0.030469
D	3	5.68 E+06	3.1	319	0.01164	0.042109
D	4	7.57 E+06	2.3	609	0.022222	0.064331

[a] σz·σy·u is based on a distance of 33.6 km.
[b] Count is for hours during which winds blow toward the sector between 22 and 41 degrees from true north during daylight hours, which are defined as between 6:00 a.m. and 8:00 p.m.
The highlighted row conservatively represents the top 1 percent of the data; the corresponding wind speed and stability were used for the Tier II analysis.