Appendix 5.1C
Dispersion Modeling and Climate Information

APPENDIX 5.1C

Dispersion Modeling and Climate Information

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Huntington Beach Energy Project
Table 5.1C.1
Commissioning Source Parameters for AERMOD Input
June 2012

Point Sources

Scenario	Building Name	Easting (X) (m)	Northing (Y) (m)	Base Elevation (m)	Stack Height (m)	Temperature (K)	Exit Velocity (m/s)	Stack Diameter (m)	NO_2 (g/s)	NO_2 (lb/hr)	CO (g/s)	CO (lb/hr)
5% Load	Stack 1	409185	3723252	3.7	36.6	500	10.1	5.49	6.11	48.5	215.4	1709
	Stack 2	409216	3723231	3.7	36.6	500	10.1	5.49	6.11	48.5	215.4	1709
	Stack 3	409245	3723210	3.7	36.6	500	10.1	5.49	6.11	48.5	215.4	1709
	Stack 4	409522	3723157	3.7	36.6	461	15.4	5.49	3.21	25.5	14.53	115.3
	Stack 5	409522	3723194	3.7	36.6	461	15.4	5.49	3.21	25.5	14.53	115.3
	Stack 6	409522	3723230	3.7	36.6	461	15.4	5.49	3.21	25.5	14.53	115.3
40% Load	Stack 1	409185	3723252	3.7	36.6	473	9.9	5.49	3.27	26.0	172.9	1373
	Stack 2	409216	3723231	3.7	36.6	473	9.9	5.49	3.27	26.0	172.9	1373
	Stack 3	409245	3723210	3.7	36.6	473	9.9	5.49	3.27	26.0	172.9	1373
	Stack 4	409522	3723157	3.7	36.6	461	15.4	5.49	3.21	25.5	14.53	115.3
	Stack 5	409522	3723194	3.7	36.6	461	15.4	5.49	3.21	25.5	14.53	115.3
	Stack 6	409522	3723230	3.7	36.6	461	15.4	5.49	3.21	25.5	14.53	115.3
50% Load	Stack 1	409185	3723252	3.7	36.6	466	9.9	5.49	13.82	109.7	399.3	3169
	Stack 2	409216	3723231	3.7	36.6	466	9.9	5.49	13.82	109.7	399.3	3169
	Stack 3	409245	3723210	3.7	36.6	466	9.9	5.49	13.82	109.7	399.3	3169
	Stack 4	409522	3723157	3.7	36.6	461	15.4	5.49	3.21	25.5	14.53	115.3
	Stack 5	409522	3723194	3.7	36.6	461	15.4	5.49	3.21	25.5	14.53	115.3
	Stack 6	409522	3723230	3.7	36.6	461	15.4	5.49	3.21	25.5	14.53	115.3
100% Load	Stack 1	409185	3723252	3.7	36.6	472	22.7	5.49	5.29	42.0	3.57	28.4
	Stack 2	409216	3723231	3.7	36.6	472	22.7	5.49	5.29	42.0	3.57	28.4
	Stack 3	409245	3723210	3.7	36.6	472	22.7	5.49	5.29	42.0	3.57	28.4
	Stack 4	409522	3723157	3.7	36.6	461	15.4	5.49	3.21	25.5	14.53	115.3
	Stack 5	409522	3723194	3.7	36.6	461	15.4	5.49	3.21	25.5	14.53	115.3
	Stack 6	409522	3723230	3.7	36.6	461	15.4	5.49	3.21	25.5	14.53	115.3

Huntington Beach Energy Project
Table 5.1C.2
Commissioning Building Parameters for AERMOD Input
June 2012

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)
Admin	2	1	3.66	3.35	16	409290	3723286	409355	3723240	409351	3723235	409348	3723237
Admin	*	2	*	5.18	14	409287	3723281	409348	3723237	409338	3723223	409343	3723219
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
AIRIN5	1	1	3.66	11.61	6	409471	3723174	409471	3723178	409476	3723188	409478	3723188
AIRIN4	1	1	3.66	11.61	6	409471	3723136	409471	3723141	409476	3723151	409478	3723151
AIRIN1	1	1	3.66	11.61	6	409172	3723196	409169	3723199	409163	3723209	409164	3723211
AIRIN2	1	1	3.66	11.61	6	409202	3723175	409199	3723178	409194	3723188	409195	3723190
AIRIN3	1	1	3.66	11.61	6	409232	3723154	409229	3723157	409224	3723167	409225	3723169
B1	2	1	3.66	23.16	4	409293	3723102	409312	3723128	409335	3723112	409317	3723086
B1	*	2	*	37.64	4	409301	3723114	409312	3723128	409335	3723112	409326	3723098
B2	2	1	3.66	23.16	4	409252	3723127	409272	3723153	409295	3723137	409277	3723111
B2	*	2	*	37.64	4	409261	3723139	409272	3723153	409295	3723137	409285	3723123

Tank Name	Base Elevation (m)	Center East (X) (m)	Center North (Y) (m)	Tank Height (m)	Tank Diameter (m)
Stack12	3.66	409274	3723095	60.96	6.27

Huntington Beach Energy Project
Table 5.1C.2
Commissioning Building Parameters for AERMOD Input
June 2012

Building Name	Number of Tiers	Tier Number	Base Elevation (m)	Tier Height (m)	Number of Corners	Corner 5 East (X) (m)	Corner 5 North (Y) (m)	Corner 6 East (X) (m)	Corner 6 North (Y) (m)	Corner 7 East (X) (m)	Corner 7 North (Y) (m)	Corner 8 East (X) (m)	Corner 8 North (Y) (m)	Corner 9 East (X) (m)	Corner 9 North (Y) (m)	Corner 10 East (X) (m)	Corner 10 North (Y) (m)
Admin	2	1	3.66	3.35	16	409338	3723223	409343	3723219	409333	3723205	409321	3723213	409323	3723216	409296	3723237
Admin	*	2	*	5.18	14	409333	3723205	409321	3723213	409323	3723216	409296	3723237	409296	3723237	409292	3723241
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	409482	3723215	409482	3723210								
AIRIN5	1	1	3.66	11.61	6	409483	3723178	409483	3723174								
AIRIN4	1	1	3.66	11.61	6	409483	3723140	409483	3723136								
AIRIN1	1	1	3.66	11.61	6	409176	3723208	409179	3723206								
AIRIN2	1	1	3.66	11.61	6	409206	3723187	409209	3723185								
AIRIN3	1	1	3.66	11.61	6	409236	3723166	409239	3723164								
B1	2	1	3.66	23.16	4												
B1	*	2	*	37.64	4												
B2	2	1	3.66	23.16	4												
B2	*	2	*	37.64	4												

Tank Name	Base Elevation (m)	Center East (X) (m)	Center North (Y) (m)	Tank Height (m)	Tank Diameter (m)
Stack12	3.66	409274	3723095	60.96	6.27

Huntington Beach Energy Project
Table 5.1C.2
Commissioning Building Parameters for AERMOD Input
June 2012

Building Name	Number of Tiers	Tier Number	Base Elevation (m)	Tier Height (m)	Number of Corners	Corner 11 East (X) (m)	Corner 11 North (Y) (m)	Corner 12 East (X) (m)	Corner 12 North (Y) (m)	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	409296	3723237	409292	3723241	409293	3723243	409279	3723252	409292	3723270	409283	3723276
Admin	*	2	*	5.18	14	409293	3723243	409279	3723252	409292	3723270	409283	3723276				
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												
B1	2	1	3.66	23.16	4												
B1	*	2	*	37.64	4												
B2	2	1	3.66	23.16	4												
B2	*	2	*	37.64	4												

Tank Name	Base Elevation (m)	Center East (X) (m)	Center North (Y) (m)	Tank Height (m)	Tank Diameter (m)
Stack12	3.66	409274	3723095	60.96	6.27

Huntington Beach Energy Project
Table 5.1C.3
Commissioning Modeling Results Summary
June 2012

Scenario	Year	NO_2 (µg/m^3)	CO (µg/m^3)	
		1-hr	1-hr	8-hr
5% Load	2005	37.4	2437	1027
	2006	56.4	3733	1877
	2007	65.6	4275	1606
40% Load	2005	22.6	2214	962
	2006	32.7	3247	1738
	2007	36.7	3591	1471
50% Load	2005	98.7	5284	2313
	2006	142	7688	4157
	2007	161	8582	3544
100% Load	2005	14.8	55.3	962
	2006	15.6	53.7	1738
	2007	19.3	56.8	1471

Huntington Beach Energy Project
Table 5.1C.4
Operational Modeling Parameters - Stack Parameters
June 2012

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
Table 5.1C.4
Operational Modeling Parameters - Stack Parameters
June 2012

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
Table 5.1C.5
Operational Modeling Parameters - Emission Rates
June 2012

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

Source ID	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 $PM_{2.5}$	
	(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)
Stack 1	3.21	25.5	14.5	115	5.72	45.4	0.31	2.45	0.31	2.45	0.31	2.45	1.20	9.50	1.20	9.50
Stack 2	3.21	25.5	14.5	115	5.72	45.4	0.31	2.45	0.31	2.45	0.31	2.45	1.20	9.50	1.20	9.50
Stack 3	3.21	25.5	14.5	115	5.72	45.4	0.31	2.45	0.31	2.45	0.31	2.45	1.20	9.50	1.20	9.50
Stack 4	3.21	25.5	14.5	115	5.72	45.4	0.31	2.45	0.31	2.45	0.31	2.45	1.20	9.50	1.20	9.50
Stack 5	3.21	25.5	14.5	115	5.72	45.4	0.31	2.45	0.31	2.45	0.31	2.45	1.20	9.50	1.20	9.50
Stack 6	3.21	25.5	14.5	115	5.72	45.4	0.31	2.45	0.31	2.45	0.31	2.45	1.20	9.50	1.20	9.50

Emission Rates for Annual Modeling

Source ID	Annual NO_2		Annual PM_{10}		Annual $PM_{2.5}$	
	(g/s)	(lb/hr)	(g/s)	(lb/hr)	(g/s)	(lb/hr)
Stack 1	1.18	9.34	0.52	4.11	0.52	4.11
Stack 2	1.18	9.34	0.52	4.11	0.52	4.11
Stack 3	1.18	9.34	0.52	4.11	0.52	4.11
Stack 4	1.18	9.34	0.52	4.11	0.52	4.11
Stack 5	1.18	9.34	0.52	4.11	0.52	4.11
Stack 6	1.18	9.34	0.52	4.11	0.52	4.11

Huntington Beach Energy Project
Table 5.1C.6
Operational Building Parameters for AERMOD Input
June 2012

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
Table 5.1C.6
Operational Building Parameters for AERMOD Input
June 2012

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
Table 5.1C.6
Operational Building Parameters for AERMOD Input
June 2012

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
Table 5.1C.7
Operational Modeling Results Summary
June 2012

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

Year	NO_2 (µg/m^3)		CO (µg/m3)		SO_2 (µg/m3)			PM_{10} (µg/m3)		$PM_{2.5}$ (µg/m3)	
	1-hr	Annual	1-hr	8-hr	1-hr	3-hr	24-hr	24-hr	Annual	24-hr	Annual
2005	14.0	-	63.2	18.2	1.45	1.28	0.61	2.19	-	2.19	-
2006	14.2	-	64.1	17.7	1.47	1.35	0.51	1.83	-	1.83	-
2007	20.0	-	90.4	22.3	2.07	1.56	0.68	2.44	-	2.44	-

Case 2: 32°F, 100% Load

Year	NO_2 (µg/m^3)		CO (µg/m3)		SO_2 (µg/m3)			PM_{10} (µg/m3)		$PM_{2.5}$ (µg/m3)	
	1-hr	Annual	1-hr	8-hr	1-hr	3-hr	24-hr	24-hr	Annual	24-hr	Annual
2005	14.0	-	63.2	17.7	1.08	0.96	0.45	1.02	-	1.02	-
2006	14.0	-	63.3	17.2	1.08	1.01	0.38	0.86	-	0.86	-
2007	18.9	-	85.6	19.0	1.46	1.10	0.45	1.03	-	1.03	-

Case 3: 32°F, 90% Load

Year	NO_2 (µg/m^3)		CO (µg/m3)		SO_2 (µg/m3)			PM_{10} (µg/m3)		$PM_{2.5}$ (µg/m3)	
	1-hr	Annual	1-hr	8-hr	1-hr	3-hr	24-hr	24-hr	Annual	24-hr	Annual
2005	14.0	-	63.2	17.5	0.98	0.87	0.42	1.04	-	1.04	-
2006	14.6	-	66.1	17.1	1.03	0.92	0.34	0.87	-	0.87	-
2007	20.4	-	92.4	22.2	1.44	1.08	0.49	1.23	-	1.23	-

Case 4: 32°F, 80% Load

Year	NO_2 (µg/m^3)		CO (µg/m3)		SO_2 (µg/m3)			PM_{10} (µg/m3)		$PM_{2.5}$ (µg/m3)	
	1-hr	Annual	1-hr	8-hr	1-hr	3-hr	24-hr	24-hr	Annual	24-hr	Annual
2005	15.8	-	71.4	17.4	0.99	0.78	0.38	1.07	-	1.07	-
2006	18.0	-	81.3	18.7	1.13	0.92	0.31	0.87	-	0.87	-
2007	23.2	-	104.8	26.3	1.45	1.06	0.53	1.48	-	1.48	-

Case 5: 32°F, 70% Load

Year	NO_2 (µg/m^3)		CO (µg/m3)		SO_2 (µg/m3)			PM_{10} (µg/m3)		$PM_{2.5}$ (µg/m3)	
	1-hr	Annual	1-hr	8-hr	1-hr	3-hr	24-hr	24-hr	Annual	24-hr	Annual
2005	20.2	-	91.5	21.9	1.16	0.83	0.36	1.10	-	1.10	-
2006	25.3	-	114.5	20.6	1.45	1.02	0.29	0.89	-	0.89	-
2007	26.9	-	121.8	28.5	1.54	1.05	0.54	1.67	-	1.67	-

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

Year	NO_2 (µg/m^3)		CO (µg/m3)		SO_2 (µg/m3)			PM_{10} (µg/m3)		$PM_{2.5}$ (µg/m3)	
	1-hr	Annual	1-hr	8-hr	1-hr	3-hr	24-hr	24-hr	Annual	24-hr	Annual
2005	14.3	-	64.9	18.1	1.42	1.22	0.59	2.22	-	2.22	-
2006	15.3	-	69.3	17.6	1.51	1.29	0.48	1.83	-	1.83	-
2007	21.0	-	94.9	23.7	2.07	1.56	0.71	2.70	-	2.70	-

Case 7: 66°F, 100% Load

Year	NO_2 (µg/m^3)		CO (µg/m3)		SO_2 (µg/m3)			PM_{10} (µg/m3)		$PM_{2.5}$ (µg/m3)	
	1-hr	Annual	1-hr	8-hr	1-hr	3-hr	24-hr	24-hr	Annual	24-hr	Annual
2005	14.0	0.86	63.2	17.6	1.01	0.90	0.42	1.03	0.22	1.03	0.11
2006	14.0	0.81	63.3	17.1	1.01	0.95	0.35	0.86	0.18	0.86	0.10
2007	19.7	0.62	89.1	21.3	1.43	1.07	0.48	1.16	0.25	1.16	0.13

Case 8: 66°F, 90% Load

Year	NO_2 (µg/m^3)		CO (µg/m3)		SO_2 (µg/m3)			PM_{10} (µg/m3)		$PM_{2.5}$ (µg/m3)	
	1-hr	Annual	1-hr	8-hr	1-hr	3-hr	24-hr	24-hr	Annual	24-hr	Annual
2005	14.5	0.84	65.5	17.4	0.95	0.81	0.39	1.06	0.20	1.06	0.11
2006	16.1	0.79	72.8	17.7	1.06	0.90	0.32	0.87	0.17	0.87	0.09
2007	21.2	0.61	96.2	23.1	1.39	1.05	0.49	1.31	0.25	1.31	0.13

Case 9: 66°F, 80% Load

Year	NO_2 (µg/m^3)		CO (µg/m3)		SO_2 (µg/m3)			PM_{10} (µg/m3)		$PM_{2.5}$ (µg/m3)	
	1-hr	Annual	1-hr	8-hr	1-hr	3-hr	24-hr	24-hr	Annual	24-hr	Annual
2005	19.2	0.83	87.1	18.1	1.15	0.74	0.36	1.08	0.19	1.08	0.10
2006	18.2	0.78	82.6	19.2	1.09	0.91	0.29	0.87	0.15	0.87	0.08
2007	23.5	0.61	106.4	26.9	1.40	1.03	0.51	1.52	0.27	1.52	0.14

Case 10: 66°F, 70% Load

Year	NO_2 (µg/m^3)		CO (µg/m3)		SO_2 (µg/m3)			PM_{10} (µg/m3)		$PM_{2.5}$ (µg/m3)	
	1-hr	Annual	1-hr	8-hr	1-hr	3-hr	24-hr	24-hr	Annual	24-hr	Annual
2005	21.2	0.84	95.8	22.3	1.13	0.82	0.34	1.11	0.17	1.11	0.09
2006	28.9	0.79	130.8	21.3	1.54	1.03	0.28	0.92	0.14	0.92	0.07

Huntington Beach Energy Project
Table 5.1C.7
Operational Modeling Results Summary

2007	30.6	0.61	138.5	29.5	1.64	1.02	0.53	1.77	0.28	1.77	0.14

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

Year	NO_2 (µg/m^3)		CO (µg/m3)		SO_2 (µg/m3)			PM_{10} (µg/m3)		$PM_{2.5}$ (µg/m3)	
	1-hr	Annual	1-hr	8-hr	1-hr	3-hr	24-hr	24-hr	Annual	24-hr	Annual
2005	14.6	-	66.3	18.0	1.41	1.19	0.58	2.24	-	2.24	-
2006	16.1	-	73.0	18.4	1.55	1.25	0.47	1.83	-	1.83	-
2007	22.2	-	100.4	24.3	2.13	1.56	0.72	2.80	-	2.80	-

Case 12: 110°F, 100% Load

Year	NO_2 (µg/m^3)		CO (µg/m3)		SO_2 (µg/m3)			PM_{10} (µg/m3)		$PM_{2.5}$ (µg/m3)	
	1-hr	Annual	1-hr	8-hr	1-hr	3-hr	24-hr	24-hr	Annual	24-hr	Annual
2005	14.0	-	63.2	17.5	0.97	0.86	0.41	1.04	-	1.04	-
2006	14.5	-	65.4	17.0	1.01	0.91	0.34	0.86	-	0.86	-
2007	20.1	-	91.1	21.8	1.40	1.06	0.48	1.20	-	1.20	-

Case 13: 110°F, 90% Load

Year	NO_2 (µg/m^3)		CO (µg/m3)		SO_2 (µg/m3)			PM_{10} (µg/m3)		$PM_{2.5}$ (µg/m3)	
	1-hr	Annual	1-hr	8-hr	1-hr	3-hr	24-hr	24-hr	Annual	24-hr	Annual
2005	19.2	-	87.0	18.4	1.11	0.71	0.35	1.08	-	1.08	-
2006	18.8	-	85.1	19.2	1.08	0.89	0.28	0.87	-	0.87	-
2007	23.6	-	106.6	26.9	1.35	0.99	0.50	1.53	-	1.53	-

Case 14: 110°F, 80% Load

Year	NO_2 (µg/m^3)		CO (µg/m3)		SO_2 (µg/m3)			PM_{10} (µg/m3)		$PM_{2.5}$ (µg/m3)	
	1-hr	Annual	1-hr	8-hr	1-hr	3-hr	24-hr	24-hr	Annual	24-hr	Annual
2005	20.5	-	92.8	22.0	1.07	0.76	0.33	1.10	-	1.10	-
2006	26.1	-	118.0	20.7	1.36	0.95	0.27	0.90	-	0.90	-
2007	27.7	-	125.4	28.7	1.45	0.97	0.50	1.70	-	1.70	-

Case 15: 110°F, 70% Load

Year	NO_2 (µg/m^3)		CO (µg/m3)		SO_2 (µg/m3)			PM_{10} (µg/m3)		$PM_{2.5}$ (µg/m3)	
	1-hr	Annual	1-hr	8-hr	1-hr	3-hr	24-hr	24-hr	Annual	24-hr	Annual
2005	22.4	-	101.5	23.8	1.07	0.80	0.30	1.13	-	1.13	-
2006	35.1	-	159.0	22.4	1.67	0.99	0.27	1.00	-	1.00	-
2007	35.6	-	160.9	30.9	1.69	1.04	0.51	1.90	-	1.90	-

Huntington Beach Energy Project
Table 5.1C.8
Construction Source Parameters for AERMOD Input
June 2012

Area Sources

Source ID	Base Elevation (m)	Release Height (m)	Number of Vertices	Vertical Dimension (m)	Easting (X1) (m)	Northing (Y1) (m)	Easting (X2) (m)	Northing (Y2) (m)	Easting (X3) (m)	Northing (Y3) (m)	Easting (X4) (m)	Northing (Y4) (m)	Easting (X5) (m)	Northing (Y5) (m)	Easting (X6) (m)	Northing (Y6) (m)	Easting (X7) (m)	Northing (Y7) (m)	Easting (X8) (m)	Northing (Y8) (m)	Easting (X9) (m)	Northing (Y9) (m)
FUG	3.7	1.0	9.0	0.93	409452	3723309	409563	3723310	409565	3723115	409537	3723136	409449	3723089	409315	3723180	409358	3723245	409372	3723242	409453	3723187

Volume Sources

Source ID	Easting (X) (m)	Northing (Y) (m)	Base Elevation (m)	Release Height (m)	Horizontal Dimension (m)	Vertical Dimension (m)
EXH1	409510	3723228	3.7	4.6	9.30	4.28
EXH2	409414	3723167	3.7	4.6	9.30	4.28

Huntington Beach Energy Project
Table 5.1C.9
Construction Modeling Parameters - Emission Rates
June 2012

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

Source ID	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 $PM_{2.5}$	
	(g/s)	(lb/hr)	(g/s)	(lb/hr)	(g/s)	(lb/hr)	(g/s)	(lb/hr)	(g/s)	(lb/hr)	(g/s)	(lb/hr)	(g/s)	(lb/hr)	(g/s)	(lb/hr)
FUG	-	-	-	-	-	-	-	-	-	-	-	-	0.455	3.61	0.087	0.688
EXH1	1.31	10.4	0.803	6.37	0.803	6.37	0.002	0.013	0.002	0.013	0.001	0.006	0.028	0.219	0.028	0.219
EXH2	1.31	10.4	0.803	6.37	0.803	6.37	0.002	0.013	0.002	0.013	0.001	0.006	0.028	0.219	0.028	0.219

Emission Rates for Annual Modeling

Source ID	Annual NO_2		Annual PM_{10}		Annual $PM_{2.5}$	
	(g/s)	(lb/hr)	(g/s)	(lb/hr)	(g/s)	(lb/hr)
FUG	-	-	0.258	2.05	0.048	0.381
EXH1	0.347	2.75	0.018	0.139	0.018	0.139
EXH2	0.347	2.75	0.018	0.139	0.018	0.139

Huntington Beach Energy Project
Table 5.1C.10
Construction Modeling Results
June 2012

Source	Year	NO_2 (µg/m^3)		CO (µg/m3)		SO_2 (µg/m3)			PM_{10} (µg/m3)		$PM_{2.5}$ (µg/m3)	
		1-hr	Annual	1-hr	8-hr	1-hr	3-hr	24-hr	24-hr	Annual	24-hr	Annual
ALL	2005	568	155	2264	1404	4.69	4.23	0.84	333	121	84.0	31.1
EXH1		-	69.2	1735	935	3.59	2.46	0.39	15.5	4.67	15.5	4.67
EXH2		-	116	2148	1311	4.45	3.99	0.77	30.4	7.84	30.4	7.84
FUG		-	-	-	-	-	-	-	314	111	59.7	20.6
ALL	2006	591	153	2289	1132	4.74	3.61	0.63	300	121	76.4	31.1
EXH1		-	71.8	1739	838	3.59	2.79	0.42	16.7	4.84	16.7	4.84
EXH2		-	115	2173	1016	4.50	3.35	0.56	22.2	7.75	22.2	7.75
FUG		-	-	-	-	-	-	-	279	111	53.2	20.6
ALL	2007	589	145	2275	1215	4.71	3.79	0.61	309	115	74.2	29.3
EXH1		-	69.1	1720	723	3.55	3.06	0.34	13.6	4.66	13.6	4.66
EXH2		-	111	2159	1030	4.47	3.51	0.51	20.1	7.48	20.1	7.48
FUG		-	-	-	-	-	-	-	74	105	56.4	19.5

Huntington Beach Energy Project
Table 5.1C.11a
First Quarter Wind Table
June 2012

Frequency Distribution (Hours)
Date Range: Jan 1 - Mar 31 (2005-2007)

Wind Speed (m/s) Wind Direction (from)	0.5 -2.1	2.1 -3.6	3.6 -5.7	5.7 -8.8	8.8 - 11.1	>= 11.1	Total
N	16	3	0	0	0	0	19
NNE	30	19	5	0	0	0	54
NE	65	58	45	0	0	0	168
ENE	109	36	12	0	0	0	157
E	149	12	0	0	0	0	161
ESE	129	37	2	0	0	0	168
SE	138	92	39	2	0	0	271
SSE	174	76	9	1	0	0	260
S	162	36	0	0	0	0	198
SSW	239	23	0	0	0	0	262
SW	376	45	0	0	0	0	421
WSW	347	219	27	0	0	0	593
W	254	157	64	2	0	0	477
WNW	94	32	3	0	0	0	129
NW	83	10	4	0	0	0	97
NNW	25	2	0	0	0	0	27
Total	2390	857	210	5	0	0	3462

Frequency of Calm Winds: 1588

Huntington Beach Energy Project
Table 5.1C.11b
Second Quarter Wind Table
June 2012

Frequency Distribution (Hours)
Date Range: Apr 1 - Jun 30 (2005-2007)

Wind Speed (m/s)	0.5 -2.1	2.1 -3.6	3.6 -5.7	5.7 -8.8	8.8 - 11.1	>= 11.1	Total
Wind Direction (from)							
N	7	0	0	0	0	0	7
NNE	3	1	0	0	0	0	4
NE	9	3	0	0	0	0	12
ENE	18	1	0	0	0	0	19
E	77	0	0	0	0	0	77
ESE	154	8	0	0	0	0	162
SE	357	45	1	0	0	0	403
SSE	339	66	0	0	0	0	405
S	319	56	0	0	0	0	375
SSW	657	77	0	0	0	0	734
SW	656	131	0	0	0	0	787
WSW	515	364	22	0	0	0	901
W	301	128	27	4	0	0	460
WNW	82	7	6	0	0	0	95
NW	38	1	1	0	0	0	40
NNW	12	1	0	0	0	0	13
Total	3544	889	57	4	0	0	4494

Frequency of Calm Winds: 1401

Huntington Beach Energy Project
Table 5.1C.11c
Third Quarter Wind Table
June 2012

Frequency Distribution (Hours)
Date Range: Jul 1 - Sep 30 (2005-2007)

Wind Speed (m/s)	0.5 -2.1	2.1 -3.6	3.6 -5.7	5.7 -8.8	8.8 - 11.1	>= 11.1	Total
Wind Direction (from)							
N	8	0	0	0	0	0	8
NNE	11	0	0	0	0	0	11
NE	11	1	0	0	0	0	12
ENE	15	0	3	0	0	0	18
E	62	0	0	0	0	0	62
ESE	98	5	0	0	0	0	103
SE	164	16	0	0	0	0	180
SSE	282	48	0	0	0	0	330
S	287	61	0	0	0	0	348
SSW	512	88	0	0	0	0	600
SW	697	147	0	0	0	0	844
WSW	796	387	1	0	0	0	1184
W	419	220	9	0	0	0	648
WNW	160	23	2	0	0	0	185
NW	93	1	0	0	0	0	94
NNW	29	1	0	0	0	0	30
Total	3644	998	15	0	0	0	4657

Frequency of Calm Winds: 1281

Huntington Beach Energy Project
Table 5.1C.11d
Fourth Quarter Wind Table
June 2012

Frequency Distribution (Hours)
Date Range: Oct 1 - Dec 31 (2005-2007)

Wind Speed (m/s)	0.5 -2.1	2.1 -3.6	3.6 -5.7	5.7 -8.8	8.8 - 11.1	>= 11.1	Total
Wind Direction (from)							
N	43	1	0	0	0	0	44
NNE	56	6	1	0	0	0	63
NE	61	30	31	4	0	0	126
ENE	110	34	25	18	0	0	187
E	203	11	5	1	0	0	220
ESE	169	8	1	0	0	0	178
SE	157	19	0	0	0	0	176
SSE	180	37	2	0	0	0	219
S	211	21	1	0	0	0	233
SSW	213	13	0	1	0	0	227
SW	327	19	0	0	0	0	346
WSW	483	106	2	0	0	0	591
W	298	134	24	2	0	0	458
WNW	171	46	8	3	0	0	228
NW	130	15	0	0	0	0	145
NNW	111	13	5	0	0	0	129
Total	2923	513	105	29	0	0	3570

Frequency of Calm Winds: 1531

Huntington Beach Energy Project
Table 5.1C.12
June 2012
Ambient Air Quality Standards Summary

Ambient Air Quality Standards

Pollutant	Averaging Time	California Standards [1]		National Standards [2]		
		Concentration [3]	Method [4]	Primary [3,5]	Secondary [3,6]	Method [7]
Ozone (O_3)	1 Hour	0.09 ppm (180 µg/m^3)	Ultraviolet Photometry	—	Same as Primary Standard	Ultraviolet Photometry
	8 Hour	0.070 ppm (137 µg/m^3)		0.075 ppm (147 µg/m^3)		
Respirable Particulate Matter (PM10)	24 Hour	50 µg/m^3	Gravimetric or Beta Attenuation	150 µg/m^3	Same as Primary Standard	Inertial Separation and Gravimetric Analysis
	Annual Arithmetic Mean	20 µg/m^3		—		
Fine Particulate Matter (PM2.5)	24 Hour	—	—	35 µg/m^3	Same as Primary Standard	Inertial Separation and Gravimetric Analysis
	Annual Arithmetic Mean	12 µg/m^3	Gravimetric or Beta Attenuation	15 µg/m^3		
Carbon Monoxide (CO)	1 Hour	20 ppm (23 mg/m^3)	Non-Dispersive Infrared Photometry (NDIR)	35 ppm (40 mg/m^3)	—	Non-Dispersive Infrared Photometry (NDIR)
	8 Hour	9.0 ppm (10 mg/m^3)		9 ppm (10 mg/m^3)	—	
	8 Hour (Lake Tahoe)	6 ppm (7 mg/m^3)		—	—	
Nitrogen Dioxide (NO_2)[8]	1 Hour	0.18 ppm (339 µg/m^3)	Gas Phase Chemiluminescence	100 ppb (188 µg/m^3)	—	Gas Phase Chemiluminescence
	Annual Arithmetic Mean	0.030 ppm (57 µg/m3)		53 ppb (100 µg/m^3)	Same as Primary Standard	
Sulfur Dioxide (SO_2)[9]	1 Hour	0.25 ppm (655 µg/m^3)	Ultraviolet Fluorescence	75 ppb (196 µg/m^3)	—	Ultraviolet Flourescence; Spectrophotometry (Pararosaniline Method)
	3 Hour	—		—	0.5 ppm (1300 µg/m^3)	
	24 Hour	0.04 ppm (105 µg/m^3)		0.14 ppm (for certain areas)[9]	—	
	Annual Arithmetic Mean	—		0.030 ppm (for certain areas)[9]	—	
Lead[10,11]	30 Day Average	1.5 µg/m^3	Atomic Absorption	—	—	High Volume Sampler and Atomic Absorption
	Calendar Quarter	—		1.5 µg/m^3 (for certain areas)[11]	Same as Primary Standard	
	Rolling 3-Month Average	—		0.15 µg/m^3		
Visibility Reducing Particles[12]	8 Hour	See footnote 12	Beta Attenuation and Transmittance through Filter Tape	No National Standards		
Sulfates	24 Hour	25 µg/m^3	Ion Chromatography			
Hydrogen Sulfide	1 Hour	0.03 ppm (42 µg/m^3)	Ultraviolet Fluorescence			
Vinyl Chloride[10]	24 Hour	0.01 ppm (26 µg/m^3)	Gas Chromatography			

1. California standards for ozone, carbon monoxide (except 8-hour Lake Tahoe), sulfur dioxide (1 and 24 hour), nitrogen dioxide, and particulate matter (PM10, PM2.5, and visibility reducing particles), are values that are not to be exceeded. All others are not to be equaled or exceeded. California ambient air quality standards are listed in the Table of Standards in Section 70200 of Title 17 of the California Code of Regulations.

2. National standards (other than ozone, particulate matter, and those based on annual arithmetic mean) are not to be exceeded more than once a year. The ozone standard is attained when the fourth highest 8-hour concentration measured at each site in a year, averaged over three years, is equal to or less than the standard. For PM10, the 24 hour standard is attained when the expected number of days per calendar year with a 24-hour average concentration above 150 $\mu g/m^3$ is equal to or less than one. For PM2.5, the 24 hour standard is attained when 98 percent of the daily concentrations, averaged over three years, are equal to or less than the standard. Contact the U.S. EPA for further clarification and current national policies.

3. Concentration expressed first in units in which it was promulgated. Equivalent units given in parentheses are based upon a reference temperature of 25°C and a reference pressure of 760 torr. Most measurements of air quality are to be corrected to a reference temperature of 25°C and a reference pressure of 760 torr; ppm in this table refers to ppm by volume, or micromoles of pollutant per mole of gas.

4. Any equivalent measurement method which can be shown to the satisfaction of the ARB to give equivalent results at or near the level of the air quality standard may be used.

5. National Primary Standards: The levels of air quality necessary, with an adequate margin of safety to protect the public health.

6. National Secondary Standards: The levels of air quality necessary to protect the public welfare from any known or anticipated adverse effects of a pollutant.

7. Reference method as described by the U.S. EPA. An "equivalent method" of measurement may be used but must have a "consistent relationship to the reference method" and must be approved by the U.S. EPA.

8. To attain the 1-hour national standard, the 3-year average of the annual 98th percentile of the 1-hour daily maximum concentrations at each site must not exceed 100 ppb. Note that the national standards are in units of parts per billion (ppb). California standards are in units of parts per million (ppm). To directly compare the national standards to the California standards the units can be converted from ppb to ppm. In this case, the national standards of 53 ppb and 100 ppb are identical to 0.053 ppm and 0.100 ppm, respectively.

9. On June 2, 2010, a new 1-hour SO_2 standard was established and the existing 24-hour and annual primary standards were revoked. To attain the 1-hour national standard, the 3-year average of the annual 99th percentile of the 1-hour daily maximum concentrations at each site must not exceed 75 ppb. The 1971 SO_2 national standards (24-hour and annual) remain in effect until one year after an area is designated for the 2010 standard, except that in areas designated nonattainment for the 1971 standards, the 1971 standards remain in effect until implementation plans to attain or maintain the 2010 standards are approved.

   Note that the 1-hour national standard is in units of parts per billion (ppb). California standards are in units of parts per million (ppm). To directly compare the 1-hour national standard to the California standard the units can be converted to ppm. In this case, the national standard of 75 ppb is identical to 0.075 ppm.

10. The ARB has identified lead and vinyl chloride as 'toxic air contaminants' with no threshold level of exposure for adverse health effects determined. These actions allow for the implementation of control measures at levels below the ambient concentrations specified for these pollutants.

11. The national standard for lead was revised on October 15, 2008 to a rolling 3-month average. The 1978 lead standard (1.5 $\mu g/m^3$ as a quarterly average) remains in effect until one year after an area is designated for the 2008 standard, except that in areas designated nonattainment for the 1978 standard, the 1978 standard remains in effect until implementation plans to attain or maintain the 2008 standard are approved.

12. In 1989, the ARB converted both the general statewide 10-mile visibility standard and the Lake Tahoe 30-mile visibility standard to instrumental equivalents, which are "extinction of 0.23 per kilometer" and "extinction of 0.07 per kilometer" for the statewide and Lake Tahoe Air Basin standards, respectively.

Huntington Beach Energy Project
Table 5.1C.13a
June 2012
Climatic Summary for Newport Beach, CA

NEWPORT BEACH HARBOR, CALIFORNIA (046175)

Period of Record Monthly Climate Summary

Period of Record : 1/ 1/1921 to 2/26/2012

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Average Max. Temperature (F)	63.2	63.4	64.0	65.2	67.1	69.1	72.3	73.4	72.9	70.9	67.8	64.2	67.8
Average Min. Temperature (F)	46.9	48.2	49.8	52.3	56.0	59.1	62.2	63.2	61.2	57.2	51.4	47.5	54.6
Average Total Precipitation (in.)	2.21	2.32	1.73	0.92	0.23	0.07	0.01	0.06	0.21	0.38	1.08	1.85	11.05
Average Total SnowFall (in.)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Average Snow Depth (in.)	0	0	0	0	0	0	0	0	0	0	0	0	0

Percent of possible observations for period of record.
Max. Temp.: 98.2% Min. Temp.: 98.2% Precipitation: 98.4% Snowfall: 93.6% Snow Depth: 93.6%
Check Station Metadata or Metadata graphics for more detail about data completeness.

Western Regional Climate Center, wrcc@dri.edu

Huntington Beach Energy Project
Table 5.1C.13b
June 2012
Climatic Summary for Long Beach, CA

LONG BEACH WSCMO, CALIFORNIA (045085)

Period of Record Monthly Climate Summary

Period of Record : 4/ 1/1958 to 2/26/2012

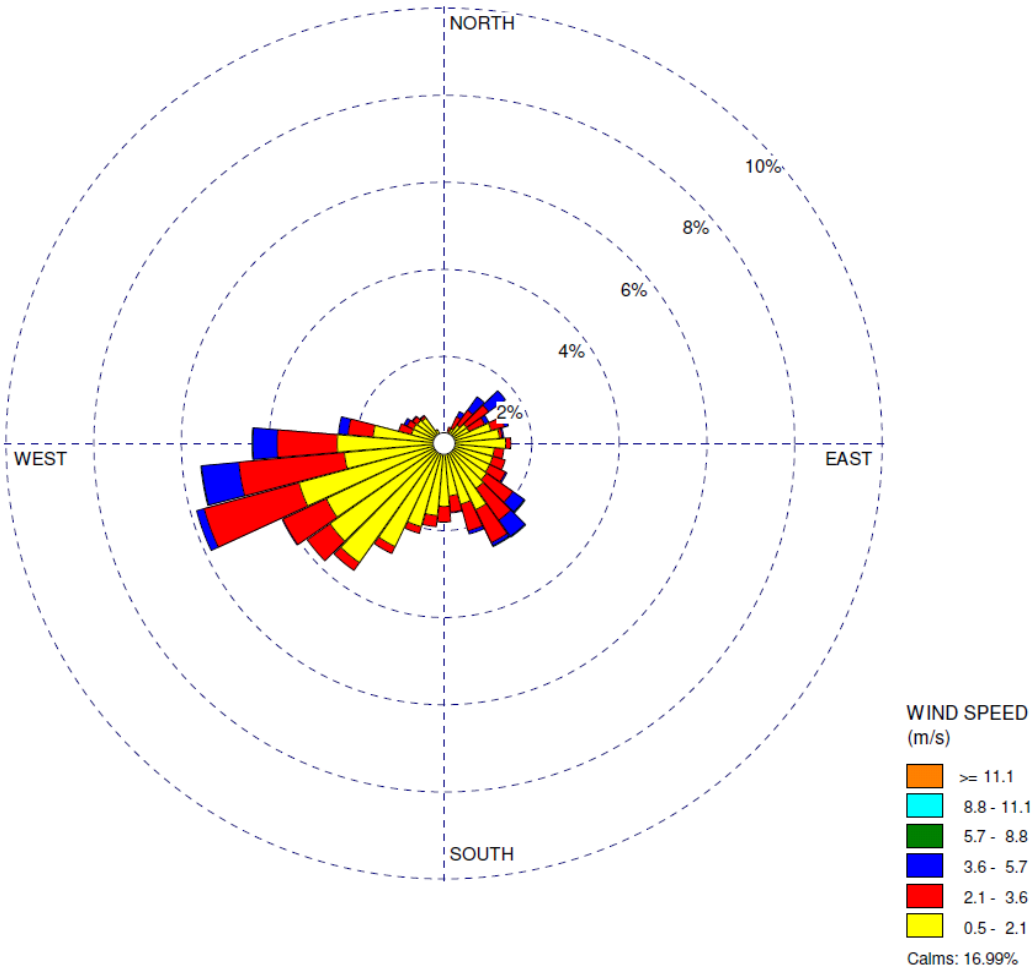
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Average Max. Temperature (F)	67.1	67.2	68.4	71.6	73.5	76.9	82.3	83.8	82.2	77.9	72.2	67.0	74.2
Average Min. Temperature (F)	45.6	47.3	49.7	52.3	56.8	60.3	63.8	64.8	62.8	57.9	50.5	45.3	54.8
Average Total Precipitation (in.)	2.63	2.90	1.84	0.69	0.20	0.06	0.02	0.06	0.19	0.42	1.21	1.80	12.01
Average Total SnowFall (in.)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Average Snow Depth (in.)	0	0	0	0	0	0	0	0	0	0	0	0	0

Percent of possible observations for period of record.
Max. Temp.: 100% Min. Temp.: 100% Precipitation: 100% Snowfall: 90% Snow Depth: 90.4%
Check Station Metadata or Metadata graphics for more detail about data completeness.

Western Regional Climate Center, wrcc@dri.edu

Huntington Beach Energy Project
Figure 5.1C-1a - June 2012
First Quarter Wind Rose
Date Range: January 1 – March 31

WIND ROSE PLOT:	DISPLAY:
SCAQMD Meteorological Data **Costa Mesa Station**	**Wind Speed** **Direction (blowing from)**

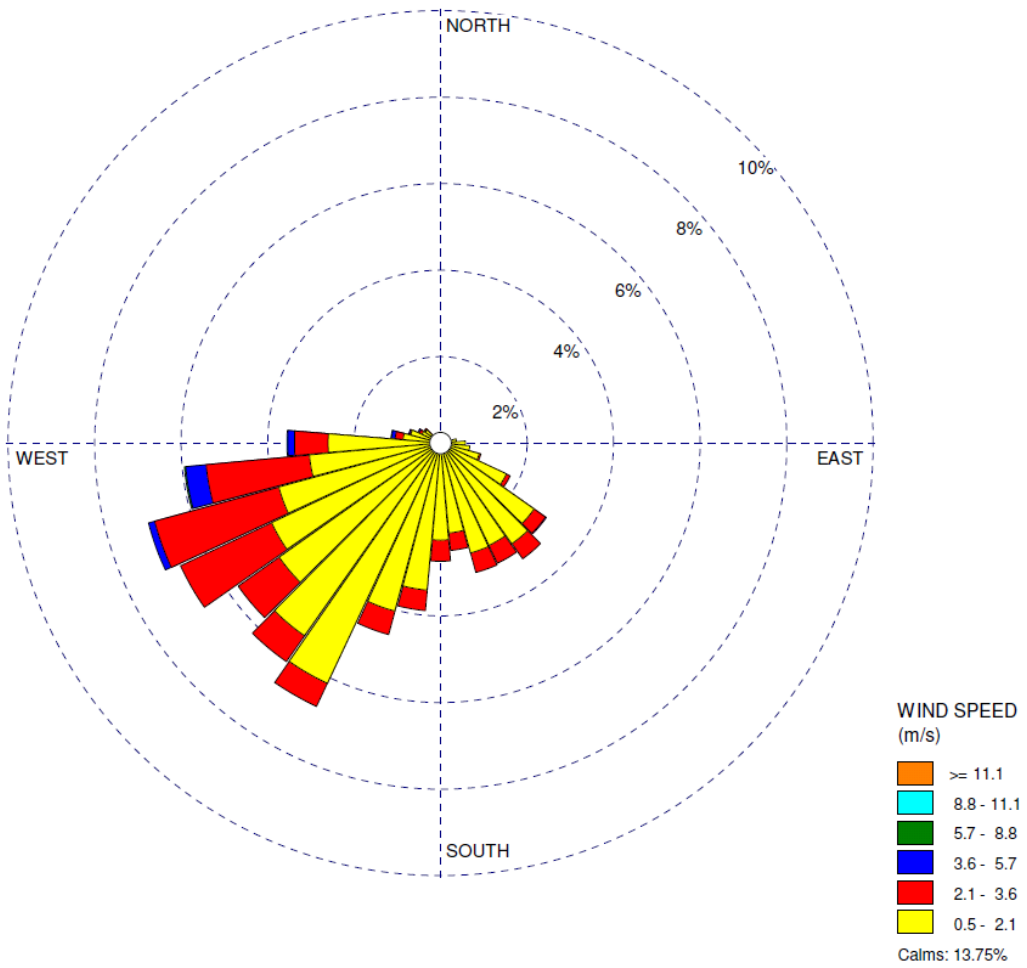


COMMENTS:	DATA PERIOD:	COMPANY NAME:	
	Start Date: 1/1/2005 - 03:00 **End Date: 3/31/2007 - 19:00**	MODELER:	
	CALM WINDS: **16.99%**	TOTAL COUNT: **5050 hrs.**	
	AVG. WIND SPEED: **1.20 m/s**	DATE: **5/25/2012**	PROJECT NO.:

Huntington Beach Energy Project
Figure 5.1C-1b – June 2012
Second Quarter Wind Rose
Date Range: April 1 – June 30

WIND ROSE PLOT:
SCAQMD Meteorological Data
Costa Mesa Station

DISPLAY:
Wind Speed
Direction (blowing from)

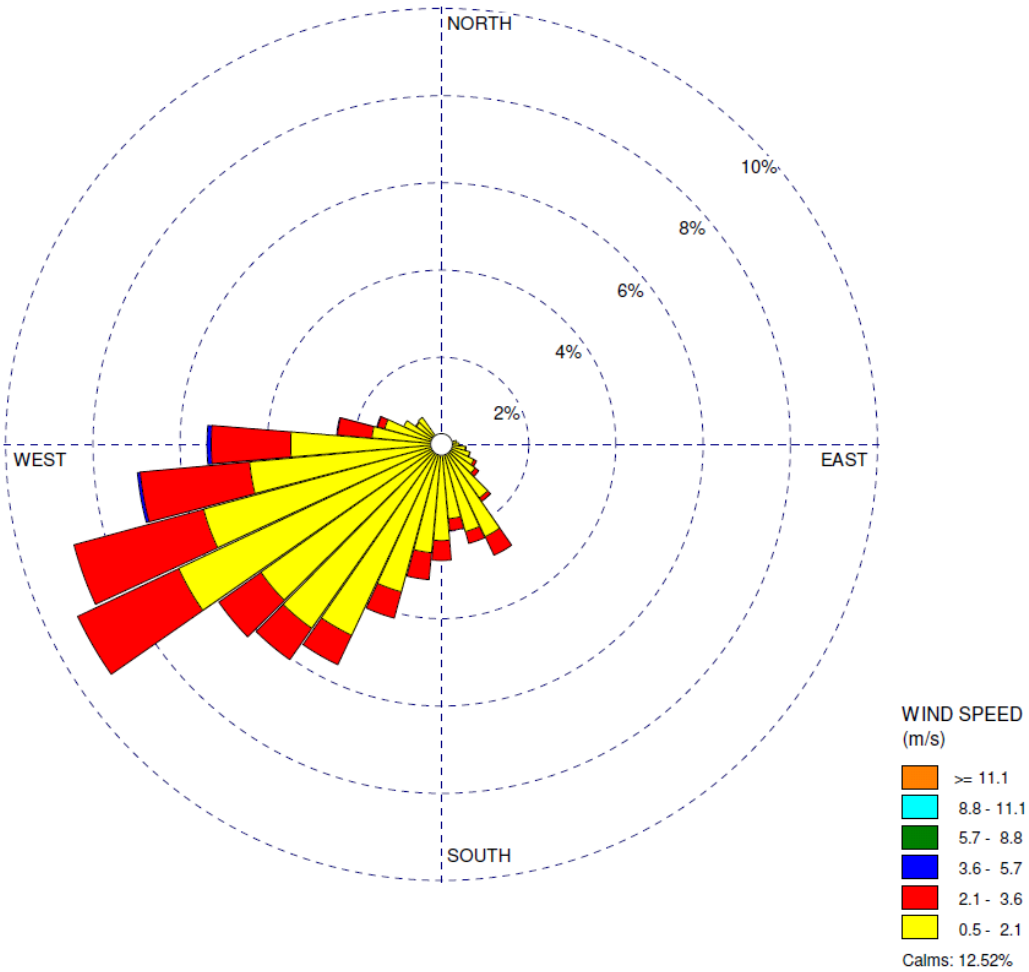


COMMENTS:	DATA PERIOD:	COMPANY NAME:	
	Start Date: 4/1/2005 - 01:00 **End Date: 6/30/2007 - 23:00**	MODELER:	
	CALM WINDS: **13.75%**	TOTAL COUNT: **5895 hrs.**	
	AVG. WIND SPEED: **1.17 m/s**	DATE: **5/25/2012**	PROJECT NO.:

Huntington Beach Energy Project
Figure 5.1C-1c - June 2012
Third Quarter Wind Rose
Date Range: July 1 – September 30

WIND ROSE PLOT:
SCAQMD Meteorological Data
Costa Mesa Station

DISPLAY:
Wind Speed
Direction (blowing from)

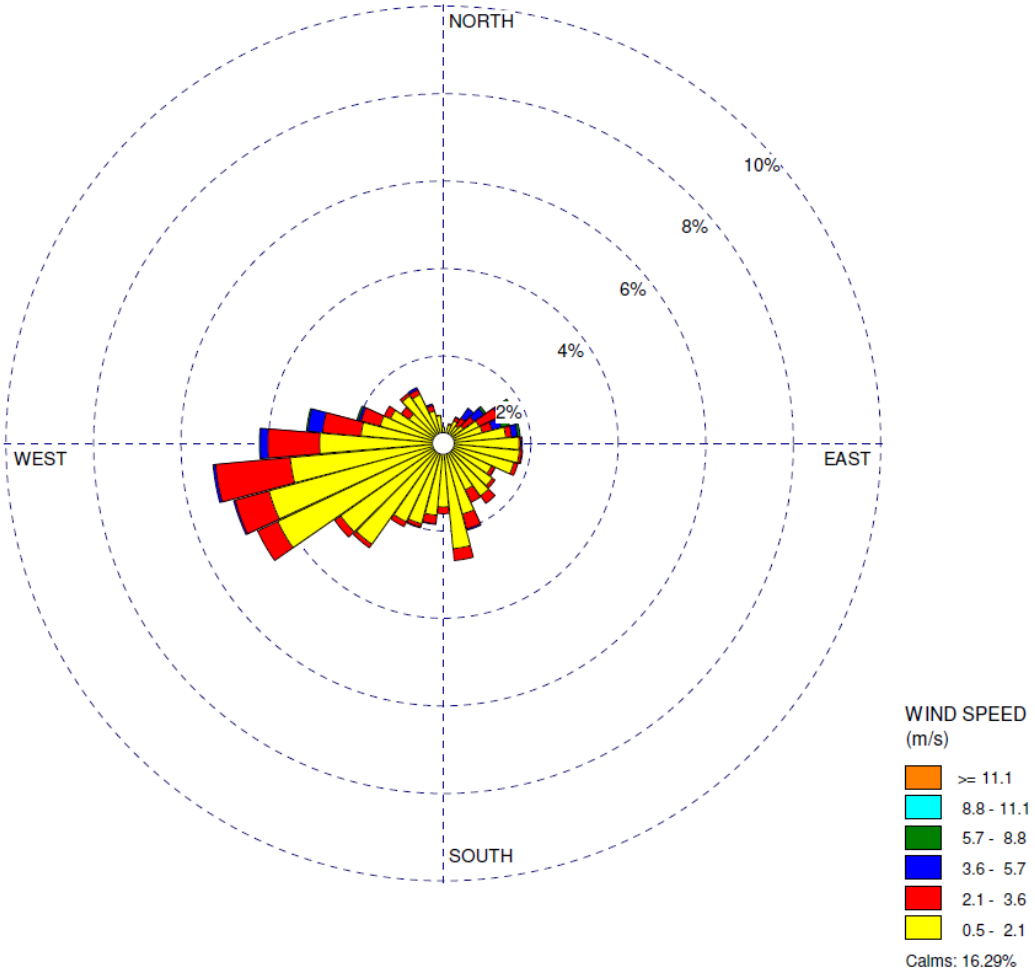


COMMENTS:	DATA PERIOD:	COMPANY NAME:	
	Start Date: 7/1/2005 - 00:00 **End Date: 9/30/2007 - 23:00**	MODELER:	
	CALM WINDS: **12.52%**	TOTAL COUNT: **5938 hrs.**	
	AVG. WIND SPEED: **1.17 m/s**	DATE: **5/25/2012**	PROJECT NO.:

Huntington Beach Energy Project
Figure 5.1C-1d- June 2012
Fourth Quarter Wind Rose
Date Range: October 1 – December 31

WIND ROSE PLOT:
SCAQMD Meteorological Data
Costa Mesa Station

DISPLAY:
Wind Speed
Direction (blowing from)

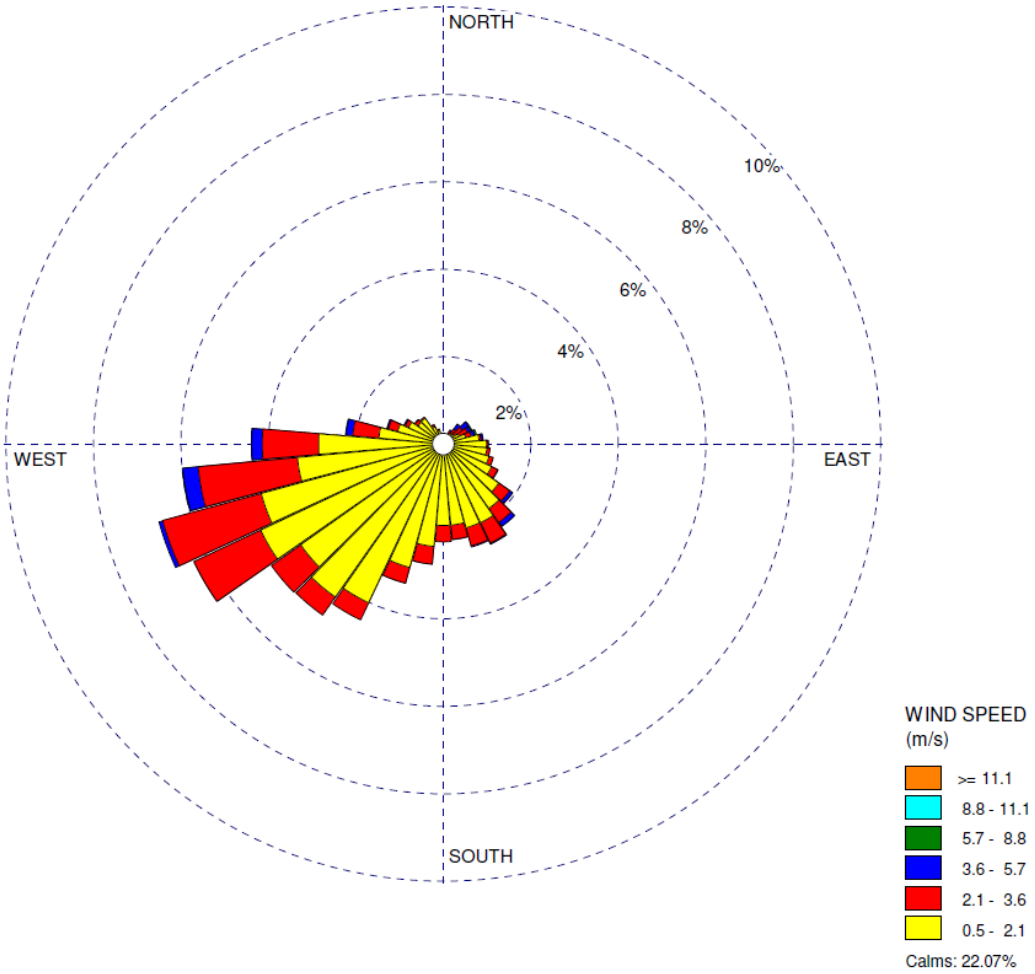


COMMENTS:	DATA PERIOD:	COMPANY NAME:	
	Start Date: 10/1/2005 - 00:00 **End Date: 12/31/2007 - 23:00**	MODELER:	
	CALM WINDS: **16.29%**	TOTAL COUNT: **5101 hrs.**	
	AVG. WIND SPEED: **1.01 m/s**	DATE: **5/25/2012**	PROJECT NO.:

Huntington Beach Energy Project
Figure 5.1C-1e - June 2012
Annual Wind Rose

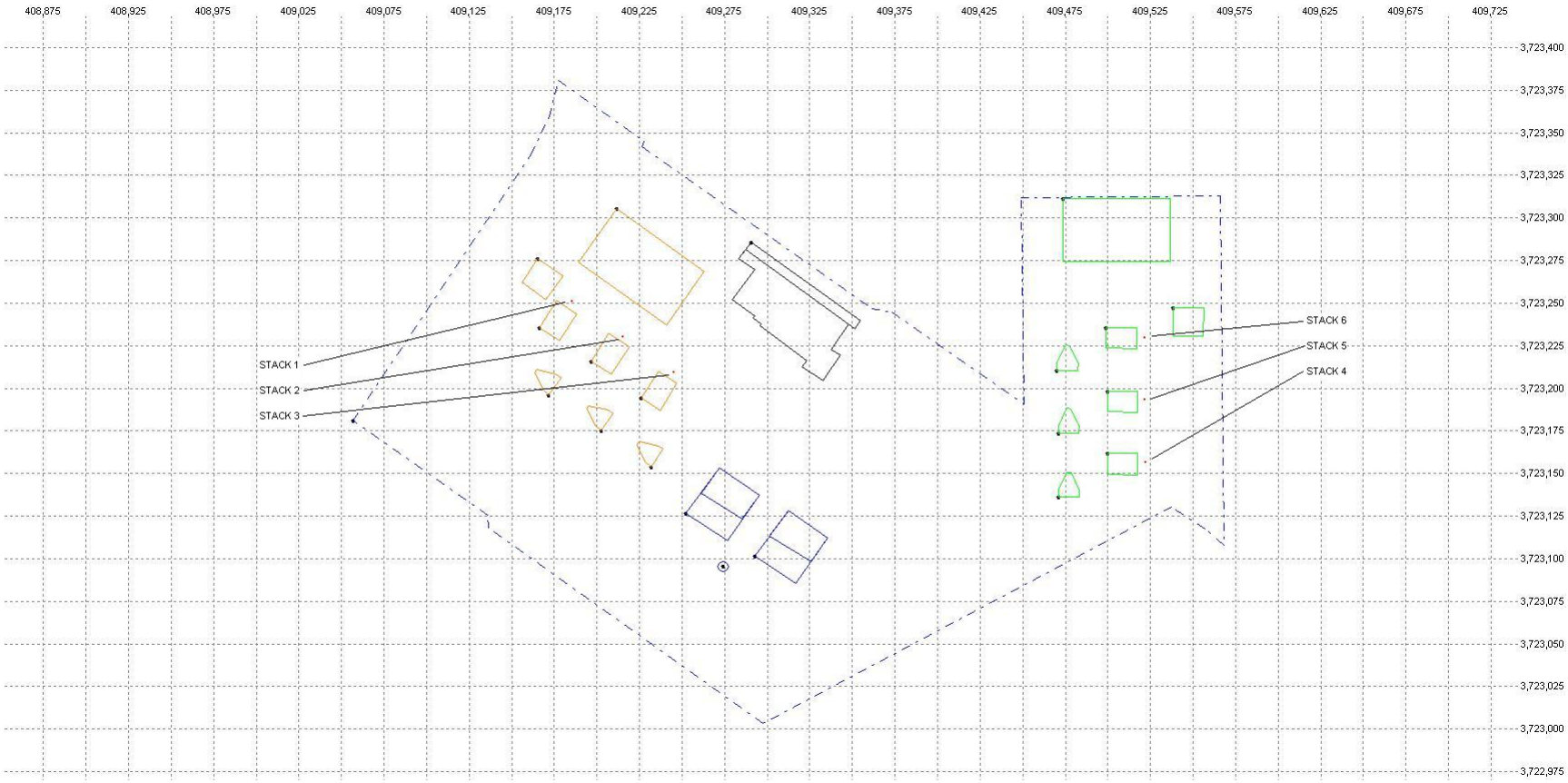
WIND ROSE PLOT:
SCAQMD Meteorological Data
Costa Mesa Station

DISPLAY:
Wind Speed
Direction (blowing from)

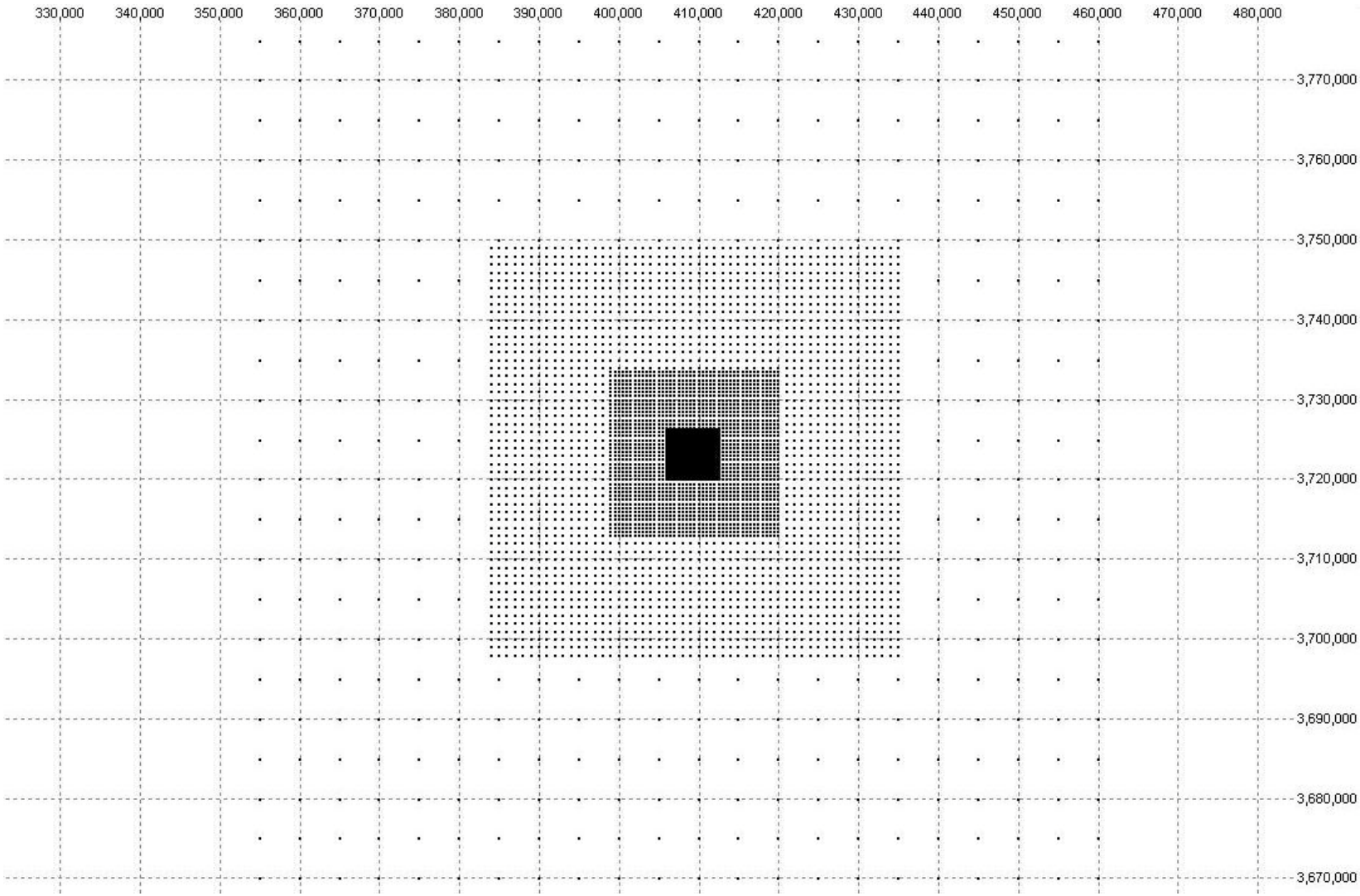


COMMENTS:	DATA PERIOD:	COMPANY NAME:	
	Start Date: 1/1/2005 - 03:00 **End Date: 12/31/2007 - 23:00**	MODELER:	
	CALM WINDS: **22.07%**	TOTAL COUNT: **21984 hrs.**	
	AVG. WIND SPEED: **1.14 m/s**	DATE: **5/25/2012**	PROJECT NO.:

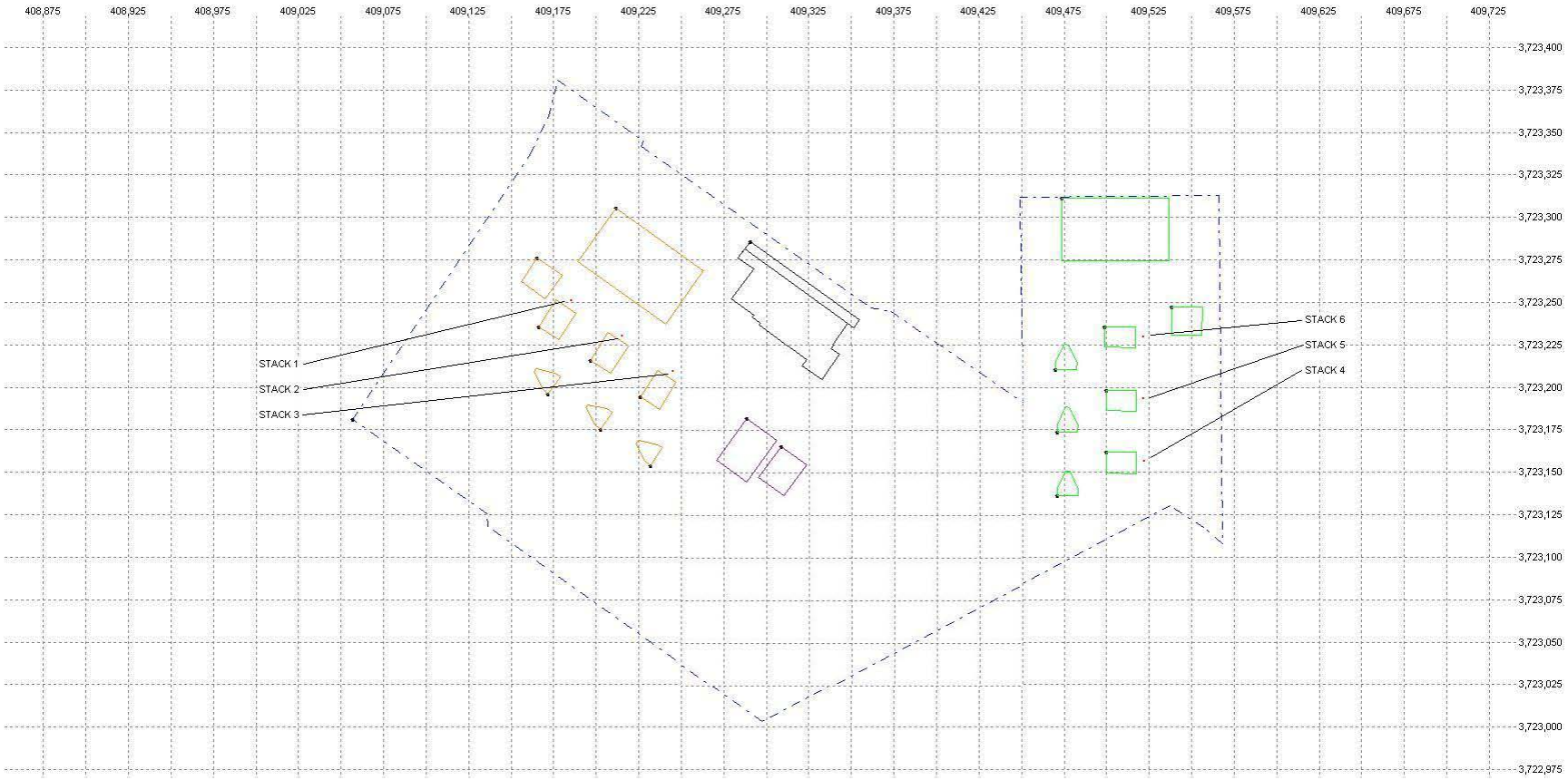
Huntington Beach Energy Project
Figure 5.1C-2
June 2012
Commissioning Model Setup



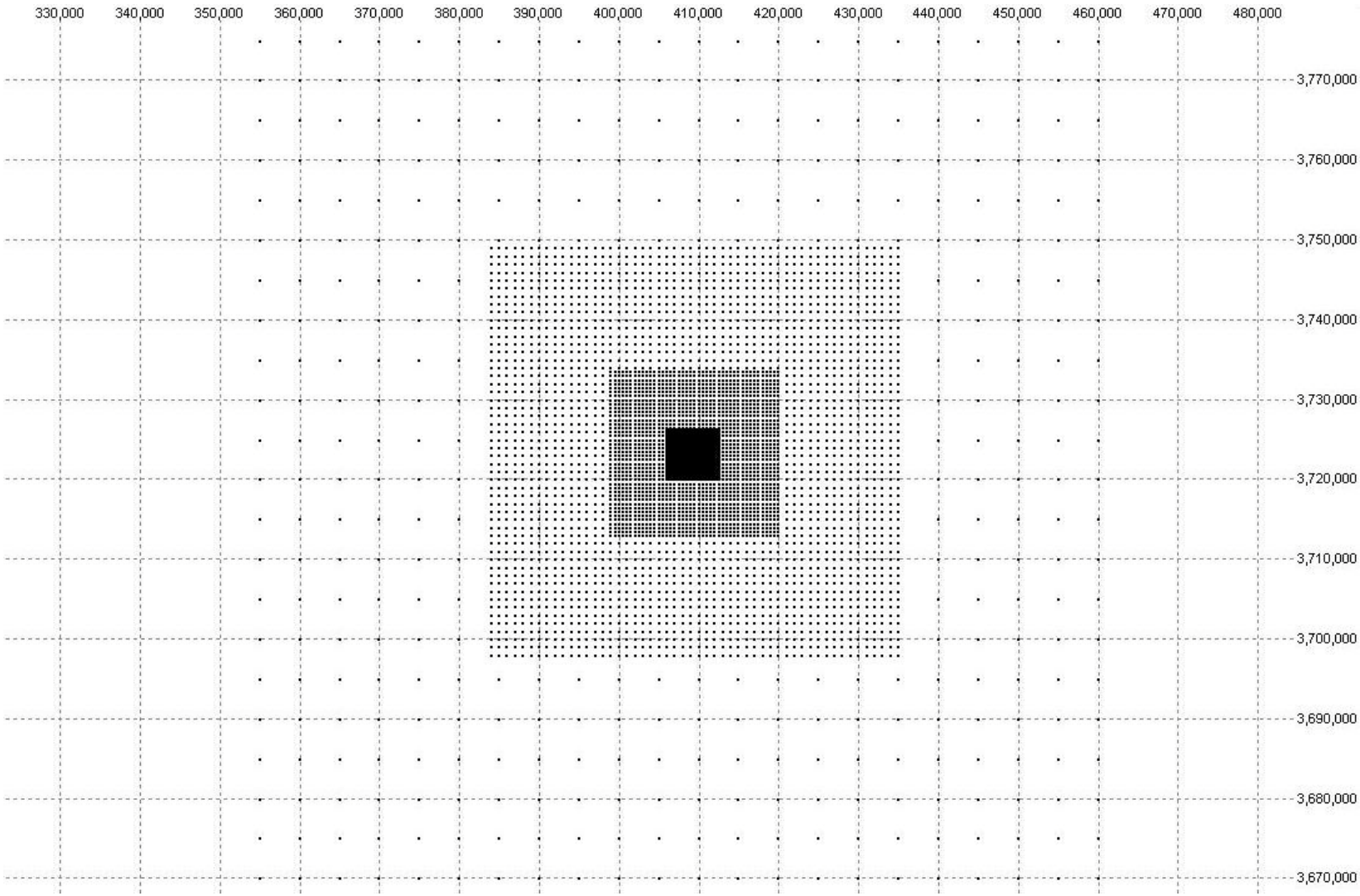
Huntington Beach Energy Project
Figure 5.1C-3
June 2012
Commissioning Coarse and Refined Receptor Grids



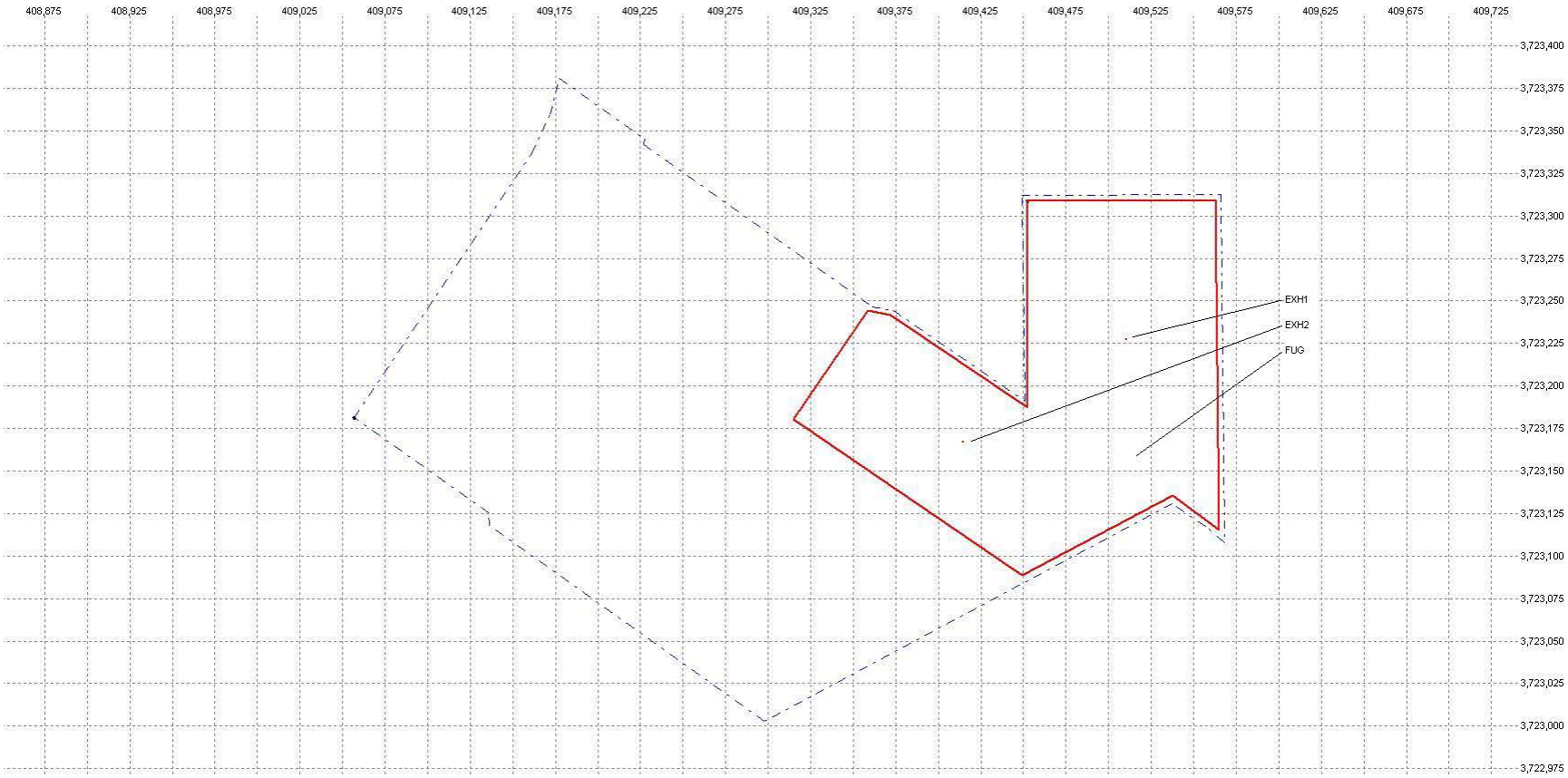
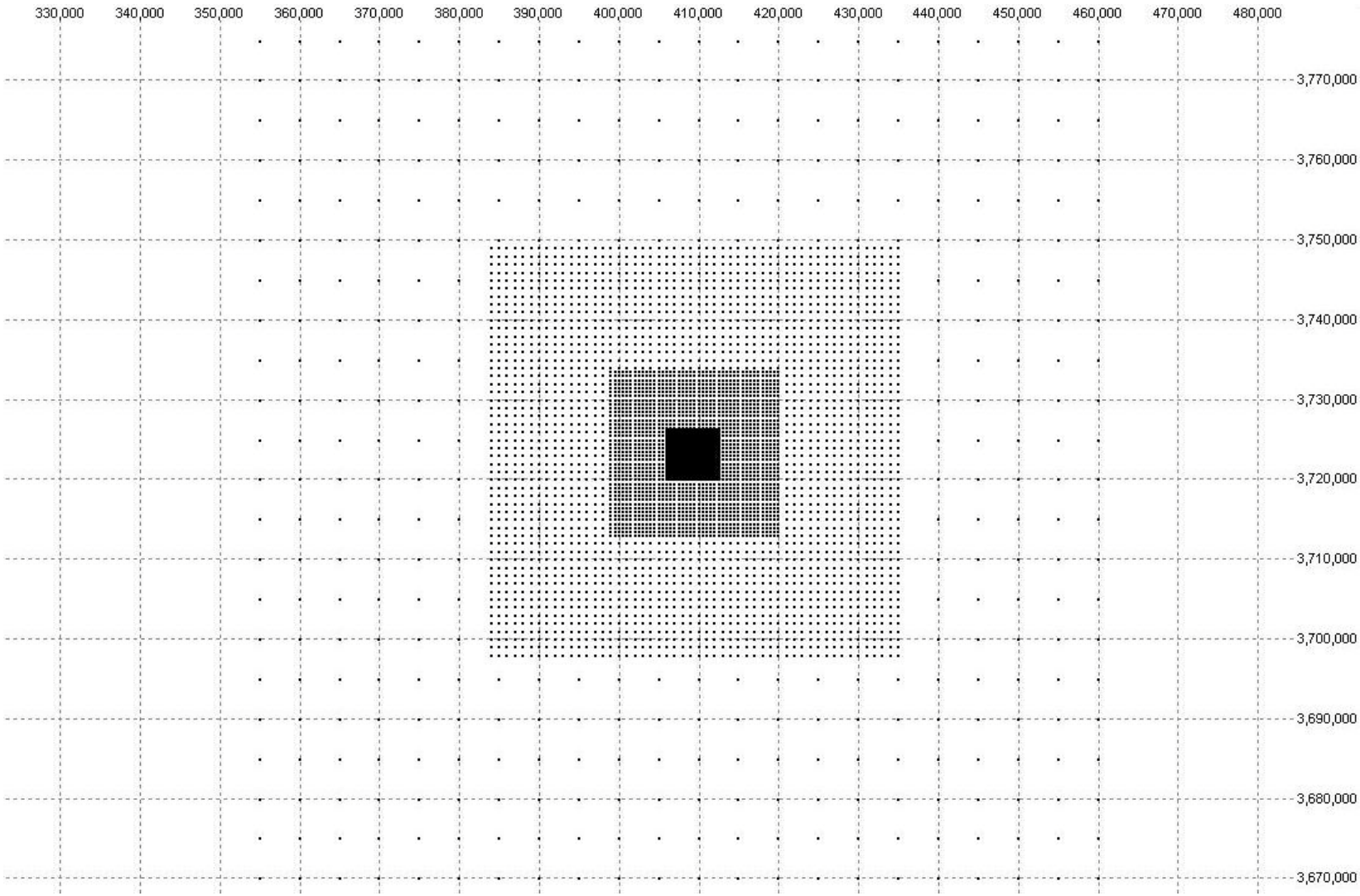
Huntington Beach Energy Project
Figure 5.1C-4
June 2012
Operational Model Setup



Huntington Beach Energy Project
Figure 5.1C-5
June 2012
Operational Coarse and Refined Receptor Grids



Huntington Beach Energy Project
Figure 5.1C-6
June 2012
Construction Model Setup



Huntington Beach Energy Project
Figure 5.1C-7
June 2012
Construction Coarse and Refined Receptor Grids