

Appendix C: Air Quality Information

**Supporting Air Quality Information
Marina Park
City of Newport Beach, California**

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Urbemis 2007 Version 9.2.4

Combined Summer Emissions Reports (Pounds/Day)

File Name: C:\MBA\Client\00640022 Marina Park\Marina Park.urb924

Project Name: Marina Park

Project Location: South Coast AQMD

On-Road Vehicle Emissions Based on: Version : Emfac2007 V2.3 Nov 1 2006

Off-Road Vehicle Emissions Based on: OFFROAD2007

Summary Report:

CONSTRUCTION EMISSION ESTIMATES

	<u>ROG</u>	<u>NOx</u>	<u>CO</u>	<u>SO2</u>	<u>PM10 Dust</u>	<u>PM10 Exhaust</u>	<u>PM10</u>	<u>PM2.5 Dust</u>	<u>PM2.5 Exhaust</u>	<u>PM2.5</u>	<u>CO2</u>
2009 TOTALS (lbs/day unmitigated)	66.24	55.53	38.91	0.02	50.03	2.85	52.55	10.45	2.62	12.77	5,510.97
2009 TOTALS (lbs/day mitigated)	66.24	55.53	38.91	0.02	8.19	2.85	10.71	1.71	2.62	4.03	5,510.97

AREA SOURCE EMISSION ESTIMATES

	<u>ROG</u>	<u>NOx</u>	<u>CO</u>	<u>SO2</u>	<u>PM10</u>	<u>PM2.5</u>	<u>CO2</u>
TOTALS (lbs/day, unmitigated)	0.68	0.39	4.92	0.00	0.02	0.02	402.83

OPERATIONAL (VEHICLE) EMISSION ESTIMATES

	<u>ROG</u>	<u>NOx</u>	<u>CO</u>	<u>SO2</u>	<u>PM10</u>	<u>PM2.5</u>	<u>CO2</u>
TOTALS (lbs/day, unmitigated)	4.80	6.67	58.56	0.07	9.97	1.94	5,921.79

SUM OF AREA SOURCE AND OPERATIONAL EMISSION ESTIMATES

	<u>ROG</u>	<u>NOx</u>	<u>CO</u>	<u>SO2</u>	<u>PM10</u>	<u>PM2.5</u>	<u>CO2</u>
TOTALS (lbs/day, unmitigated)	5.48	7.06	63.48	0.07	9.99	1.96	6,324.62

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Construction Unmitigated Detail Report:

CONSTRUCTION EMISSION ESTIMATES Summer Pounds Per Day, Unmitigated

	<u>ROG</u>	<u>NOx</u>	<u>CO</u>	<u>SO2</u>	<u>PM10 Dust</u>	<u>PM10 Exhaust</u>	<u>PM10</u>	<u>PM2.5 Dust</u>	<u>PM2.5 Exhaust</u>	<u>PM2.5</u>	<u>CO2</u>
Time Slice 1/5/2009-1/16/2009 Active Days: 10	1.60	11.62	7.55	0.00	1.27	0.79	2.06	0.27	0.72	0.99	1,157.03
Demolition 01/05/2009-01/16/2009	1.60	11.62	7.55	0.00	1.27	0.79	2.06	0.27	0.72	0.99	1,157.03
Fugitive Dust	0.00	0.00	0.00	0.00	1.26	0.00	1.26	0.26	0.00	0.26	0.00
Demo Off Road Diesel	1.45	10.12	5.88	0.00	0.00	0.72	0.72	0.00	0.67	0.67	856.00
Demo On Road Diesel	0.11	1.42	0.55	0.00	0.01	0.06	0.07	0.00	0.05	0.06	176.60
Demo Worker Trips	0.04	0.07	1.13	0.00	0.01	0.00	0.01	0.00	0.00	0.00	124.43
Time Slice 1/19/2009-3/13/2009 Active Days: 40	6.06	55.53	27.81	0.01	50.03	2.52	52.55	10.45	2.32	12.77	5,490.68
Mass Grading 01/19/2009-03/13/2009	6.06	55.53	27.81	0.01	50.03	2.52	52.55	10.45	2.32	12.77	5,490.68
Mass Grading Dust	0.00	0.00	0.00	0.00	50.00	0.00	50.00	10.44	0.00	10.44	0.00
Mass Grading Off Road Diesel	5.60	50.26	23.59	0.00	0.00	2.30	2.30	0.00	2.11	2.11	4,606.06
Mass Grading On Road Diesel	0.39	5.13	1.97	0.01	0.02	0.21	0.24	0.01	0.20	0.20	635.76
Mass Grading Worker Trips	0.07	0.14	2.25	0.00	0.01	0.01	0.02	0.00	0.01	0.01	248.86
Time Slice 3/16/2009-3/31/2009 Active Days: 12	2.90	23.32	11.89	0.00	0.01	1.29	1.30	0.00	1.19	1.19	2,212.48
Trenching 03/16/2009-03/31/2009	2.90	23.32	11.89	0.00	0.01	1.29	1.30	0.00	1.19	1.19	2,212.48
Trenching Off Road Diesel	2.86	23.26	10.77	0.00	0.00	1.29	1.29	0.00	1.19	1.19	2,088.05
Trenching Worker Trips	0.04	0.07	1.13	0.00	0.01	0.00	0.01	0.00	0.00	0.00	124.43

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Time Slice 4/1/2009-4/30/2009 Active Days: 22	7.55	45.22	38.91	0.02	10.08	2.68	12.75	2.12	2.46	4.58	5,510.97
Building 04/01/2009-12/24/2009	4.33	18.70	24.80	0.02	0.07	1.34	1.41	0.03	1.23	1.25	3,139.22
Building Off Road Diesel	3.87	17.35	11.50	0.00	0.00	1.28	1.28	0.00	1.17	1.17	1,621.20
Building Vendor Trips	0.05	0.58	0.47	0.00	0.00	0.02	0.03	0.00	0.02	0.02	101.00
Building Worker Trips	0.41	0.77	12.84	0.01	0.07	0.04	0.11	0.02	0.03	0.06	1,417.02
Fine Grading 04/01/2009-04/30/2009	3.22	26.52	14.10	0.00	10.01	1.34	11.34	2.09	1.23	3.32	2,371.75
Fine Grading Dust	0.00	0.00	0.00	0.00	10.00	0.00	10.00	2.09	0.00	2.09	0.00
Fine Grading Off Road Diesel	3.18	26.46	12.98	0.00	0.00	1.33	1.33	0.00	1.23	1.23	2,247.32
Fine Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fine Grading Worker Trips	0.04	0.07	1.13	0.00	0.01	0.00	0.01	0.00	0.00	0.00	124.43
Time Slice 5/1/2009-11/30/2009 Active Days: 152	4.33	18.70	24.80	0.02	0.07	1.34	1.41	0.03	1.23	1.25	3,139.22
Building 04/01/2009-12/24/2009	4.33	18.70	24.80	0.02	0.07	1.34	1.41	0.03	1.23	1.25	3,139.22
Building Off Road Diesel	3.87	17.35	11.50	0.00	0.00	1.28	1.28	0.00	1.17	1.17	1,621.20
Building Vendor Trips	0.05	0.58	0.47	0.00	0.00	0.02	0.03	0.00	0.02	0.02	101.00
Building Worker Trips	0.41	0.77	12.84	0.01	0.07	0.04	0.11	0.02	0.03	0.06	1,417.02

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Time Slice 12/1/2009-12/24/2009 Active Days: 18	<u>66.24</u>	36.87	37.55	<u>0.02</u>	0.09	<u>2.85</u>	2.94	0.03	<u>2.62</u>	2.65	4,888.16
Asphalt 12/01/2009-12/24/2009	3.21	18.12	11.97	0.00	0.02	1.51	1.53	0.01	1.39	1.40	1,663.75
Paving Off-Gas	0.25	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Paving Off Road Diesel	2.81	16.83	9.27	0.00	0.00	1.46	1.46	0.00	1.34	1.34	1,272.04
Paving On Road Diesel	0.09	1.15	0.44	0.00	0.00	0.05	0.05	0.00	0.04	0.05	142.85
Paving Worker Trips	0.07	0.14	2.25	0.00	0.01	0.01	0.02	0.00	0.01	0.01	248.86
Building 04/01/2009-12/24/2009	4.33	18.70	24.80	0.02	0.07	1.34	1.41	0.03	1.23	1.25	3,139.22
Building Off Road Diesel	3.87	17.35	11.50	0.00	0.00	1.28	1.28	0.00	1.17	1.17	1,621.20
Building Vendor Trips	0.05	0.58	0.47	0.00	0.00	0.02	0.03	0.00	0.02	0.02	101.00
Building Worker Trips	0.41	0.77	12.84	0.01	0.07	0.04	0.11	0.02	0.03	0.06	1,417.02
Coating 12/01/2009-12/24/2009	58.70	0.05	0.77	0.00	0.00	0.00	0.01	0.00	0.00	0.00	85.20
Architectural Coating	58.67	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Coating Worker Trips	0.02	0.05	0.77	0.00	0.00	0.00	0.01	0.00	0.00	0.00	85.20

Phase Assumptions

Phase: Demolition 1/5/2009 - 1/16/2009 - Demolition

Building Volume Total (cubic feet): 30000

Building Volume Daily (cubic feet): 3000

On Road Truck Travel (VMT): 41.67

Off-Road Equipment:

1 Concrete/Industrial Saws (10 hp) operating at a 0.73 load factor for 8 hours per day

1 Rubber Tired Dozers (357 hp) operating at a 0.59 load factor for 2 hours per day

2 Tractors/Loaders/Backhoes (108 hp) operating at a 0.55 load factor for 6 hours per day

Phase: Fine Grading 4/1/2009 - 4/30/2009 - Fine grading

Total Acres Disturbed: 2

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Maximum Daily Acreage Disturbed: 1

Fugitive Dust Level of Detail: Default

10 lbs per acre-day

On Road Truck Travel (VMT): 0

Off-Road Equipment:

1 Graders (174 hp) operating at a 0.61 load factor for 6 hours per day

1 Rubber Tired Dozers (357 hp) operating at a 0.59 load factor for 6 hours per day

1 Tractors/Loaders/Backhoes (108 hp) operating at a 0.55 load factor for 7 hours per day

1 Water Trucks (189 hp) operating at a 0.5 load factor for 8 hours per day

Phase: Mass Grading 1/19/2009 - 3/13/2009 - Mass grading

Total Acres Disturbed: 10

Maximum Daily Acreage Disturbed: 5

Fugitive Dust Level of Detail: Default

10 lbs per acre-day

On Road Truck Travel (VMT): 150

Off-Road Equipment:

1 Aerial Lifts (60 hp) operating at a 0.46 load factor for 6 hours per day

1 Graders (174 hp) operating at a 0.61 load factor for 6 hours per day

2 Other Equipment (190 hp) operating at a 0.62 load factor for 8 hours per day

2 Rubber Tired Dozers (357 hp) operating at a 0.59 load factor for 6 hours per day

1 Tractors/Loaders/Backhoes (108 hp) operating at a 0.55 load factor for 7 hours per day

1 Water Trucks (189 hp) operating at a 0.5 load factor for 6 hours per day

Phase: Trenching 3/16/2009 - 3/31/2009 - Trenching

Off-Road Equipment:

2 Excavators (168 hp) operating at a 0.57 load factor for 8 hours per day

1 Other Material Handling Equipment (191 hp) operating at a 0.59 load factor for 8 hours per day

1 Tractors/Loaders/Backhoes (108 hp) operating at a 0.55 load factor for 8 hours per day

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Phase: Paving 12/1/2009 - 12/24/2009 - Paving

Acres to be Paved: 1.69

Off-Road Equipment:

4 Cement and Mortar Mixers (10 hp) operating at a 0.56 load factor for 6 hours per day

1 Pavers (100 hp) operating at a 0.62 load factor for 7 hours per day

1 Paving Equipment (104 hp) operating at a 0.53 load factor for 8 hours per day

1 Rollers (95 hp) operating at a 0.56 load factor for 7 hours per day

1 Tractors/Loaders/Backhoes (108 hp) operating at a 0.55 load factor for 7 hours per day

Phase: Building Construction 4/1/2009 - 12/24/2009 - Default Building Construction Description

Off-Road Equipment:

1 Cranes (399 hp) operating at a 0.43 load factor for 6 hours per day

2 Forklifts (145 hp) operating at a 0.3 load factor for 6 hours per day

1 Generator Sets (49 hp) operating at a 0.74 load factor for 8 hours per day

1 Tractors/Loaders/Backhoes (108 hp) operating at a 0.55 load factor for 8 hours per day

3 Welders (45 hp) operating at a 0.45 load factor for 8 hours per day

Phase: Architectural Coating 12/1/2009 - 12/24/2009 - Default Architectural Coating Description

Rule: Residential Interior Coatings begins 1/1/2005 ends 6/30/2008 specifies a VOC of 100

Rule: Residential Interior Coatings begins 7/1/2008 ends 12/31/2040 specifies a VOC of 50

Rule: Residential Exterior Coatings begins 1/1/2005 ends 6/30/2008 specifies a VOC of 250

Rule: Residential Exterior Coatings begins 7/1/2008 ends 12/31/2040 specifies a VOC of 100

Rule: Nonresidential Interior Coatings begins 1/1/2005 ends 12/31/2040 specifies a VOC of 250

Rule: Nonresidential Exterior Coatings begins 1/1/2005 ends 12/31/2040 specifies a VOC of 250

Construction Mitigated Detail Report:

CONSTRUCTION EMISSION ESTIMATES Summer Pounds Per Day, Mitigated

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	<u>ROG</u>	<u>NOx</u>	<u>CO</u>	<u>SO2</u>	<u>PM10 Dust</u>	<u>PM10 Exhaust</u>	<u>PM10</u>	<u>PM2.5 Dust</u>	<u>PM2.5 Exhaust</u>	<u>PM2.5</u>	<u>CO2</u>
Time Slice 1/5/2009-1/16/2009 Active Days: 10	1.60	11.62	7.55	0.00	1.27	0.79	2.06	0.27	0.72	0.99	1,157.03
Demolition 01/05/2009- 01/16/2009	1.60	11.62	7.55	0.00	1.27	0.79	2.06	0.27	0.72	0.99	1,157.03
Fugitive Dust	0.00	0.00	0.00	0.00	1.26	0.00	1.26	0.26	0.00	0.26	0.00
Demo Off Road Diesel	1.45	10.12	5.88	0.00	0.00	0.72	0.72	0.00	0.67	0.67	856.00
Demo On Road Diesel	0.11	1.42	0.55	0.00	0.01	0.06	0.07	0.00	0.05	0.06	176.60
Demo Worker Trips	0.04	0.07	1.13	0.00	0.01	0.00	0.01	0.00	0.00	0.00	124.43
Time Slice 1/19/2009-3/13/2009 Active Days: 40	6.06	55.53	27.81	0.01	8.19	2.52	10.71	1.71	2.32	4.03	5,490.68
Mass Grading 01/19/2009- 03/13/2009	6.06	55.53	27.81	0.01	8.19	2.52	10.71	1.71	2.32	4.03	5,490.68
Mass Grading Dust	0.00	0.00	0.00	0.00	8.16	0.00	8.16	1.70	0.00	1.70	0.00
Mass Grading Off Road Diesel	5.60	50.26	23.59	0.00	0.00	2.30	2.30	0.00	2.11	2.11	4,606.06
Mass Grading On Road Diesel	0.39	5.13	1.97	0.01	0.02	0.21	0.24	0.01	0.20	0.20	635.76
Mass Grading Worker Trips	0.07	0.14	2.25	0.00	0.01	0.01	0.02	0.00	0.01	0.01	248.86
Time Slice 3/16/2009-3/31/2009 Active Days: 12	2.90	23.32	11.89	0.00	0.01	1.29	1.30	0.00	1.19	1.19	2,212.48
Trenching 03/16/2009-03/31/2009	2.90	23.32	11.89	0.00	0.01	1.29	1.30	0.00	1.19	1.19	2,212.48
Trenching Off Road Diesel	2.86	23.26	10.77	0.00	0.00	1.29	1.29	0.00	1.19	1.19	2,088.05
Trenching Worker Trips	0.04	0.07	1.13	0.00	0.01	0.00	0.01	0.00	0.00	0.00	124.43

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Time Slice 4/1/2009-4/30/2009 Active Days: 22	7.55	45.22	<u>38.91</u>	0.02	2.35	2.68	5.03	0.50	2.46	2.96	<u>5,510.97</u>
Building 04/01/2009-12/24/2009	4.33	18.70	24.80	0.02	0.07	1.34	1.41	0.03	1.23	1.25	3,139.22
Building Off Road Diesel	3.87	17.35	11.50	0.00	0.00	1.28	1.28	0.00	1.17	1.17	1,621.20
Building Vendor Trips	0.05	0.58	0.47	0.00	0.00	0.02	0.03	0.00	0.02	0.02	101.00
Building Worker Trips	0.41	0.77	12.84	0.01	0.07	0.04	0.11	0.02	0.03	0.06	1,417.02
Fine Grading 04/01/2009-04/30/2009	3.22	26.52	14.10	0.00	2.28	1.34	3.62	0.48	1.23	1.71	2,371.75
Fine Grading Dust	0.00	0.00	0.00	0.00	2.28	0.00	2.28	0.48	0.00	0.48	0.00
Fine Grading Off Road Diesel	3.18	26.46	12.98	0.00	0.00	1.33	1.33	0.00	1.23	1.23	2,247.32
Fine Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fine Grading Worker Trips	0.04	0.07	1.13	0.00	0.01	0.00	0.01	0.00	0.00	0.00	124.43
Time Slice 5/1/2009-11/30/2009 Active Days: 152	4.33	18.70	24.80	0.02	0.07	1.34	1.41	0.03	1.23	1.25	3,139.22
Building 04/01/2009-12/24/2009	4.33	18.70	24.80	0.02	0.07	1.34	1.41	0.03	1.23	1.25	3,139.22
Building Off Road Diesel	3.87	17.35	11.50	0.00	0.00	1.28	1.28	0.00	1.17	1.17	1,621.20
Building Vendor Trips	0.05	0.58	0.47	0.00	0.00	0.02	0.03	0.00	0.02	0.02	101.00
Building Worker Trips	0.41	0.77	12.84	0.01	0.07	0.04	0.11	0.02	0.03	0.06	1,417.02

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Time Slice 12/1/2009-12/24/2009 Active Days: 18	66.24	36.87	37.55	0.02	0.09	2.85	2.94	0.03	2.62	2.65	4,888.16
Asphalt 12/01/2009-12/24/2009	3.21	18.12	11.97	0.00	0.02	1.51	1.53	0.01	1.39	1.40	1,663.75
Paving Off-Gas	0.25	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Paving Off Road Diesel	2.81	16.83	9.27	0.00	0.00	1.46	1.46	0.00	1.34	1.34	1,272.04
Paving On Road Diesel	0.09	1.15	0.44	0.00	0.00	0.05	0.05	0.00	0.04	0.05	142.85
Paving Worker Trips	0.07	0.14	2.25	0.00	0.01	0.01	0.02	0.00	0.01	0.01	248.86
Building 04/01/2009-12/24/2009	4.33	18.70	24.80	0.02	0.07	1.34	1.41	0.03	1.23	1.25	3,139.22
Building Off Road Diesel	3.87	17.35	11.50	0.00	0.00	1.28	1.28	0.00	1.17	1.17	1,621.20
Building Vendor Trips	0.05	0.58	0.47	0.00	0.00	0.02	0.03	0.00	0.02	0.02	101.00
Building Worker Trips	0.41	0.77	12.84	0.01	0.07	0.04	0.11	0.02	0.03	0.06	1,417.02
Coating 12/01/2009-12/24/2009	58.70	0.05	0.77	0.00	0.00	0.00	0.01	0.00	0.00	0.00	85.20
Architectural Coating	58.67	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Coating Worker Trips	0.02	0.05	0.77	0.00	0.00	0.00	0.01	0.00	0.00	0.00	85.20

Construction Related Mitigation Measures

The following mitigation measures apply to Phase: Fine Grading 4/1/2009 - 4/30/2009 - Fine grading

For Soil Stabilizing Measures, the Water exposed surfaces 2x daily watering mitigation reduces emissions by:

PM10: 55% PM25: 55%

For Soil Stabilizing Measures, the Equipment loading/unloading mitigation reduces emissions by:

PM10: 69% PM25: 69%

For Unpaved Roads Measures, the Reduce speed on unpaved roads to less than 15 mph mitigation reduces emissions by:

PM10: 44% PM25: 44%

The following mitigation measures apply to Phase: Mass Grading 1/19/2009 - 3/13/2009 - Mass grading

For Soil Stabilizing Measures, the Water exposed surfaces 2x daily watering mitigation reduces emissions by:

PM10: 55% PM25: 55%

For Soil Stabilizing Measures, the Equipment loading/unloading mitigation reduces emissions by:

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PM10: 69% PM25: 69%

For Unpaved Roads Measures, the Reduce speed on unpaved roads to less than 15 mph mitigation reduces emissions by:

PM10: 44% PM25: 44%

For Unpaved Roads Measures, the Manage haul road dust 2x daily watering mitigation reduces emissions by:

PM10: 55% PM25: 55%

Area Source Unmitigated Detail Report:

AREA SOURCE EMISSION ESTIMATES Summer Pounds Per Day, Unmitigated

<u>Source</u>	<u>ROG</u>	<u>NOx</u>	<u>CO</u>	<u>SO2</u>	<u>PM10</u>	<u>PM2.5</u>	<u>CO2</u>
Natural Gas	0.02	0.33	0.28	0.00	0.00	0.00	394.40
Hearth - No Summer Emissions							
Landscape	0.37	0.06	4.64	0.00	0.02	0.02	8.43
Consumer Products	0.00						
Architectural Coatings	0.29						
TOTALS (lbs/day, unmitigated)	0.68	0.39	4.92	0.00	0.02	0.02	402.83

Area Source Changes to Defaults

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Operational Unmitigated Detail Report:

OPERATIONAL EMISSION ESTIMATES Summer Pounds Per Day, Unmitigated

Source	ROG	NOX	CO	SO2	PM10	PM25	CO2
City park	0.53	0.75	6.57	0.01	1.12	0.22	663.88
Community Center/Sailing Center/Cafe	3.50	5.06	44.43	0.05	7.56	1.47	4,493.69
Visitor Marina - Berths	0.77	0.86	7.56	0.01	1.29	0.25	764.22
TOTALS (lbs/day, unmitigated)	4.80	6.67	58.56	0.07	9.97	1.94	5,921.79

Operational Settings:

Does not include correction for passby trips

Does not include double counting adjustment for internal trips

Analysis Year: 2010 Temperature (F): 80 Season: Summer

Erfac: Version : Erfac2007 V2.3 Nov 1 2006

Summary of Land Uses

Land Use Type	Acreage	Trip Rate	Unit Type	No. Units	Total Trips	Total VMT
City park		15.80	acres	4.50	71.10	645.77
Community Center/Sailing Center/Cafe		22.88	1000 sq ft	21.30	487.34	4,372.94
Visitor Marina - Berths		2.96	1000 sq ft	28.00	82.88	743.68
					641.32	5,762.39

Vehicle Fleet Mix

Vehicle Type	Percent Type	Non-Catalyst	Catalyst	Diesel
Light Auto	51.7	1.2	98.6	0.2
Light Truck < 3750 lbs	7.3	2.7	94.6	2.7

Vehicle Fleet Mix

Vehicle Type	Percent Type	Non-Catalyst	Catalyst	Diesel
Light Truck 3751-5750 lbs	22.9	0.4	99.6	0.0
Med Truck 5751-8500 lbs	10.6	0.9	99.1	0.0
Lite-Heavy Truck 8501-10,000 lbs	1.6	0.0	81.2	18.8
Lite-Heavy Truck 10,001-14,000 lbs	0.5	0.0	60.0	40.0
Med-Heavy Truck 14,001-33,000 lbs	0.9	0.0	22.2	77.8
Heavy-Heavy Truck 33,001-60,000 lbs	0.5	0.0	0.0	100.0
Other Bus	0.1	0.0	0.0	100.0
Urban Bus	0.1	0.0	0.0	100.0
Motorcycle	2.8	67.9	32.1	0.0
School Bus	0.1	0.0	0.0	100.0
Motor Home	0.9	0.0	88.9	11.1

Travel Conditions

	Residential			Commercial		
	Home-Work	Home-Shop	Home-Other	Commuter	Non-Work	Customer
Urban Trip Length (miles)	12.7	7.0	9.5	13.3	7.4	8.9
Rural Trip Length (miles)	17.6	12.1	14.9	15.4	9.6	12.6
Trip speeds (mph)	30.0	30.0	30.0	30.0	30.0	30.0
% of Trips - Residential	32.9	18.0	49.1			
% of Trips - Commercial (by land use)						
City park				5.0	2.5	92.5

Travel Conditions

	Residential			Commercial		
	Home-Work	Home-Shop	Home-Other	Commute	Non-Work	Customer
Community Center/Sailing Center/Cafe				2.0	1.0	97.0
Visitor Marina - Berths				2.0	1.0	97.0

Operational Changes to Defaults

Urbemis 2007 Version 9.2.4

Combined Winter Emissions Reports (Pounds/Day)

File Name: C:\MBA\Client\00640022 Marina Park\Marina Park.urb924

Project Name: Marina Park

Project Location: South Coast AQMD

On-Road Vehicle Emissions Based on: Version : Emfac2007 V2.3 Nov 1 2006

Off-Road Vehicle Emissions Based on: OFFROAD2007

Area Source Unmitigated Detail Report:

AREA SOURCE EMISSION ESTIMATES Winter Pounds Per Day, Unmitigated

<u>Source</u>	<u>ROG</u>	<u>NOx</u>	<u>CO</u>	<u>SO2</u>	<u>PM10</u>	<u>PM2.5</u>	<u>CO2</u>
Natural Gas	0.02	0.33	0.28	0.00	0.00	0.00	394.40
Hearth	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Landscaping - No Winter Emissions							
Consumer Products	0.00						
Architectural Coatings	0.29						
TOTALS (lbs/day, unmitigated)	0.31	0.33	0.28	0.00	0.00	0.00	394.40

Area Source Changes to Defaults

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Operational Unmitigated Detail Report:

OPERATIONAL EMISSION ESTIMATES Winter Pounds Per Day, Unmitigated

Source	ROG	NOX	CO	SO2	PM10	PM25	CO2
City park	0.58	0.90	6.34	0.01	1.12	0.22	601.18
Community Center/Sailing Center/Cafe	3.92	6.10	42.91	0.04	7.56	1.47	4,069.09
Visitor Marina - Berths	0.75	1.04	7.30	0.01	1.29	0.25	692.01
TOTALS (lbs/day, unmitigated)	5.25	8.04	56.55	0.06	9.97	1.94	5,362.28

Operational Settings:

Does not include correction for passby trips

Does not include double counting adjustment for internal trips

Analysis Year: 2010 Temperature (F): 60 Season: Winter

Erfac: Version : Erfac2007 V2.3 Nov 1 2006

Summary of Land Uses

Land Use Type	Acreage	Trip Rate	Unit Type	No. Units	Total Trips	Total VMT
City park		15.80	acres	4.50	71.10	645.77
Community Center/Sailing Center/Cafe		22.88	1000 sq ft	21.30	487.34	4,372.94
Visitor Marina - Berths		2.96	1000 sq ft	28.00	82.88	743.68
					641.32	5,762.39

Vehicle Fleet Mix

Vehicle Type	Percent Type	Non-Catalyst	Catalyst	Diesel
Light Auto	51.7	1.2	98.6	0.2
Light Truck < 3750 lbs	7.3	2.7	94.6	2.7

Vehicle Fleet Mix

Vehicle Type	Percent Type	Non-Catalyst	Catalyst	Diesel
Light Truck 3751-5750 lbs	22.9	0.4	99.6	0.0
Med Truck 5751-8500 lbs	10.6	0.9	99.1	0.0
Lite-Heavy Truck 8501-10,000 lbs	1.6	0.0	81.2	18.8
Lite-Heavy Truck 10,001-14,000 lbs	0.5	0.0	60.0	40.0
Med-Heavy Truck 14,001-33,000 lbs	0.9	0.0	22.2	77.8
Heavy-Heavy Truck 33,001-60,000 lbs	0.5	0.0	0.0	100.0
Other Bus	0.1	0.0	0.0	100.0
Urban Bus	0.1	0.0	0.0	100.0
Motorcycle	2.8	67.9	32.1	0.0
School Bus	0.1	0.0	0.0	100.0
Motor Home	0.9	0.0	88.9	11.1

Travel Conditions

	Residential			Commercial		
	Home-Work	Home-Shop	Home-Other	Commute	Non-Work	Customer
Urban Trip Length (miles)	12.7	7.0	9.5	13.3	7.4	8.9
Rural Trip Length (miles)	17.6	12.1	14.9	15.4	9.6	12.6
Trip speeds (mph)	30.0	30.0	30.0	30.0	30.0	30.0
% of Trips - Residential	32.9	18.0	49.1			
% of Trips - Commercial (by land use)						
City park				5.0	2.5	92.5

Travel Conditions

	Residential			Commercial		
	Home-Work	Home-Shop	Home-Other	Commute	Non-Work	Customer
Community Center/Sailing Center/Cafe				2.0	1.0	97.0
Visitor Marina - Berths				2.0	1.0	97.0

Operational Changes to Defaults

Combined Summer Emissions Reports (Pounds/Day)

File Name: I:\Marina Park\URBEMIS\ExistingLandUses.urb924

Project Name: Marina Park Existing Land Uses

Project Location: South Coast AQMD

On-Road Vehicle Emissions Based on: Version : Emfac2007 V2.3 Nov 1 2006

Off-Road Vehicle Emissions Based on: OFFROAD2007

Summary Report:

AREA SOURCE EMISSION ESTIMATES

	<u>ROG</u>	<u>NOx</u>	<u>CO</u>	<u>SO2</u>	<u>PM10</u>	<u>PM2.5</u>	<u>CO2</u>
TOTALS (lbs/day, unmitigated)	3.95	0.97	4.81	0.00	0.01	0.01	1,192.12

OPERATIONAL (VEHICLE) EMISSION ESTIMATES

	<u>ROG</u>	<u>NOx</u>	<u>CO</u>	<u>SO2</u>	<u>PM10</u>	<u>PM2.5</u>	<u>CO2</u>
TOTALS (lbs/day, unmitigated)	2.36	2.69	25.01	0.02	0.19	0.12	2,033.10

SUM OF AREA SOURCE AND OPERATIONAL EMISSION ESTIMATES

	<u>ROG</u>	<u>NOx</u>	<u>CO</u>	<u>SO2</u>	<u>PM10</u>	<u>PM2.5</u>	<u>CO2</u>
TOTALS (lbs/day, unmitigated)	6.31	3.66	29.82	0.02	0.20	0.13	3,225.22

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Area Source Unmitigated Detail Report:

AREA SOURCE EMISSION ESTIMATES Summer Pounds Per Day, Unmitigated

<u>Source</u>	<u>ROG</u>	<u>NOx</u>	<u>CO</u>	<u>SO2</u>	<u>PM10</u>	<u>PM2.5</u>	<u>CO2</u>
Natural Gas	0.07	0.93	0.40	0.00	0.00	0.00	1,185.30
Hearth - No Summer Emissions							
Landscape	0.63	0.04	4.41	0.00	0.01	0.01	6.82
Consumer Products	2.92						
Architectural Coatings	0.33						
TOTALS (lbs/day, unmitigated)	3.95	0.97	4.81	0.00	0.01	0.01	1,192.12

Area Source Changes to Defaults

Percentage of residences with wood stoves changed from 10% to 0%

Percentage of residences with wood fireplaces changed from 5% to 0%

Percentage of residences with natural gas fireplaces changed from 85% to 0%

Operational Unmitigated Detail Report:

OPERATIONAL EMISSION ESTIMATES Summer Pounds Per Day, Unmitigated

<u>Source</u>	<u>ROG</u>	<u>NOX</u>	<u>CO</u>	<u>SO2</u>	<u>PM10</u>	<u>PM25</u>	<u>CO2</u>
Mobile home park	2.36	2.69	25.01	0.02	0.19	0.12	2,033.10
TOTALS (lbs/day, unmitigated)	2.36	2.69	25.01	0.02	0.19	0.12	2,033.10

Operational Settings:

Does not include correction for passby trips

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Does not include double counting adjustment for internal trips

Analysis Year: 2008 Temperature (F): 80 Season: Summer

Emfac: Version : Emfac2007 V2.3 Nov 1 2006

Summary of Land Uses

Land Use Type	Acreage	Trip Rate	Unit Type	No. Units	Total Trips	Total VMT
Mobile home park	9.50	3.40	dwelling units	57.00	193.80	1,957.92
					193.80	1,957.92

Vehicle Fleet Mix

Vehicle Type	Percent Type	Non-Catalyst	Catalyst	Diesel
Light Auto	51.6	1.7	97.9	0.4
Light Truck < 3750 lbs	7.4	4.1	91.8	4.1
Light Truck 3751-5750 lbs	22.9	0.9	99.1	0.0
Med Truck 5751-8500 lbs	10.6	0.9	99.1	0.0
Lite-Heavy Truck 8501-10,000 lbs	1.6	0.0	81.2	18.8
Lite-Heavy Truck 10,001-14,000 lbs	0.5	0.0	60.0	40.0
Med-Heavy Truck 14,001-33,000 lbs	0.9	0.0	22.2	77.8
Heavy-Heavy Truck 33,001-60,000 lbs	0.5	0.0	0.0	100.0
Other Bus	0.1	0.0	0.0	100.0
Urban Bus	0.1	0.0	0.0	100.0
Motorcycle	2.8	78.6	21.4	0.0
School Bus	0.1	0.0	0.0	100.0
Motor Home	0.9	11.1	77.8	11.1

Travel Conditions

	Residential			Commercial		
	Home-Work	Home-Shop	Home-Other	Commute	Non-Work	Customer
Urban Trip Length (miles)	12.7	7.0	9.5	13.3	7.4	8.9
Rural Trip Length (miles)	17.6	12.1	14.9	15.4	9.6	12.6
Trip speeds (mph)	30.0	30.0	30.0	30.0	30.0	30.0
% of Trips - Residential	32.9	18.0	49.1			

% of Trips - Commercial (by land use)

Combined Winter Emissions Reports (Pounds/Day)

File Name: I:\Marina Park\URBEMIS\ExistingLandUses.urb924

Project Name: Marina Park Existing Land Uses

Project Location: South Coast AQMD

On-Road Vehicle Emissions Based on: Version : Emfac2007 V2.3 Nov 1 2006

Off-Road Vehicle Emissions Based on: OFFROAD2007

Summary Report:

AREA SOURCE EMISSION ESTIMATES

	<u>ROG</u>	<u>NOx</u>	<u>CO</u>	<u>SO2</u>	<u>PM10</u>	<u>PM2.5</u>	<u>CO2</u>
TOTALS (lbs/day, unmitigated)	3.32	0.93	0.40	0.00	0.00	0.00	1,185.30

OPERATIONAL (VEHICLE) EMISSION ESTIMATES

	<u>ROG</u>	<u>NOx</u>	<u>CO</u>	<u>SO2</u>	<u>PM10</u>	<u>PM2.5</u>	<u>CO2</u>
TOTALS (lbs/day, unmitigated)	2.38	3.25	24.17	0.02	0.19	0.12	1,844.92

SUM OF AREA SOURCE AND OPERATIONAL EMISSION ESTIMATES

	<u>ROG</u>	<u>NOx</u>	<u>CO</u>	<u>SO2</u>	<u>PM10</u>	<u>PM2.5</u>	<u>CO2</u>
TOTALS (lbs/day, unmitigated)	5.70	4.18	24.57	0.02	0.19	0.12	3,030.22

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Area Source Unmitigated Detail Report:

AREA SOURCE EMISSION ESTIMATES Winter Pounds Per Day, Unmitigated

<u>Source</u>	<u>ROG</u>	<u>NOx</u>	<u>CO</u>	<u>SO2</u>	<u>PM10</u>	<u>PM2.5</u>	<u>CO2</u>
Natural Gas	0.07	0.93	0.40	0.00	0.00	0.00	1,185.30
Hearth	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Landscaping - No Winter Emissions							
Consumer Products	2.92						
Architectural Coatings	0.33						
TOTALS (lbs/day, unmitigated)	3.32	0.93	0.40	0.00	0.00	0.00	1,185.30

Area Source Changes to Defaults

Percentage of residences with wood stoves changed from 10% to 0%

Percentage of residences with wood fireplaces changed from 5% to 0%

Percentage of residences with natural gas fireplaces changed from 85% to 0%

Operational Unmitigated Detail Report:

OPERATIONAL EMISSION ESTIMATES Winter Pounds Per Day, Unmitigated

<u>Source</u>	<u>ROG</u>	<u>NOX</u>	<u>CO</u>	<u>SO2</u>	<u>PM10</u>	<u>PM25</u>	<u>CO2</u>
Mobile home park	2.38	3.25	24.17	0.02	0.19	0.12	1,844.92
TOTALS (lbs/day, unmitigated)	2.38	3.25	24.17	0.02	0.19	0.12	1,844.92

Operational Settings:

Does not include correction for passby trips

9/29/2008 2:29:29 PM

Does not include double counting adjustment for internal trips

Analysis Year: 2008 Temperature (F): 60 Season: Winter

Emfac: Version : Emfac2007 V2.3 Nov 1 2006

Summary of Land Uses

Land Use Type	Acreage	Trip Rate	Unit Type	No. Units	Total Trips	Total VMT
Mobile home park	9.50	3.40	dwelling units	57.00	193.80	1,957.92
					193.80	1,957.92

Vehicle Fleet Mix

Vehicle Type	Percent Type	Non-Catalyst	Catalyst	Diesel
Light Auto	51.6	1.7	97.9	0.4
Light Truck < 3750 lbs	7.4	4.1	91.8	4.1
Light Truck 3751-5750 lbs	22.9	0.9	99.1	0.0
Med Truck 5751-8500 lbs	10.6	0.9	99.1	0.0
Lite-Heavy Truck 8501-10,000 lbs	1.6	0.0	81.2	18.8
Lite-Heavy Truck 10,001-14,000 lbs	0.5	0.0	60.0	40.0
Med-Heavy Truck 14,001-33,000 lbs	0.9	0.0	22.2	77.8
Heavy-Heavy Truck 33,001-60,000 lbs	0.5	0.0	0.0	100.0
Other Bus	0.1	0.0	0.0	100.0
Urban Bus	0.1	0.0	0.0	100.0
Motorcycle	2.8	78.6	21.4	0.0
School Bus	0.1	0.0	0.0	100.0
Motor Home	0.9	11.1	77.8	11.1

Travel Conditions

	Residential			Commercial		
	Home-Work	Home-Shop	Home-Other	Commute	Non-Work	Customer
Urban Trip Length (miles)	12.7	7.0	9.5	13.3	7.4	8.9
Rural Trip Length (miles)	17.6	12.1	14.9	15.4	9.6	12.6
Trip speeds (mph)	30.0	30.0	30.0	30.0	30.0	30.0
% of Trips - Residential	32.9	18.0	49.1			

% of Trips - Commercial (by land use)

Marina Emissions

Marina Park

Prepared on October 15, 2008

Prepared by Michael Brandman Associates

Boats 100
Hours run per day 1

Emissions	HC	NOx	CO	PM10	SO2	CO2	PM2.5
Emission Factor (g/hour)	11	63	38	8	10	6412	
Emissions (g/day)	1100	6300	3800	800	1000	641200	
Emissions (lbs/day)	2.4	13.9	8.4	1.8	2.2	1411	1.6
Emissions (tons/year)	0.4	3	2	0.3	0.4	257	0.3

Note:
Emission factor from U.S. EPA model, NONROAD for diesel pleasure craft, inboard/sterndrive, between 25 and 40 horsepower.

PM2.5 emissions were estimated from PM10 emissions by assuming 92% of PM10.

Emission Factors by Horsepower, SCC, and Pollutant

All Fuels

Grams/Operating Hour

Orange County

Marina Park
2010 (Marina)

Total for year: 2009

Date of Model Run: Oct 14 15:54:24: 2008

Today's Date: 10/14/2008

Fuel Type	SCC	Equipment Description	Engine Type	Horsepower	Exhaust THC	Exhaust NOx	Exhaust CO	Exhaust PM10	Exhaust SO2	Exhaust CO2	Crankcase THC	Diurnal THC
Diesel												
Pleasure Craft												
2282020005		Inboard/Sterndrive	Diesel									
				6 < HP <= 11	4	25	17	3	3	2,000	0	0
				11 < HP <= 16	6	34	21	4	5	3,065	0	0
				16 < HP <= 25	8	49	30	6	7	4,398	0	0
				25 < HP <= 40	11	63	38	8	10	6,412	0	0
				40 < HP <= 50	15	86	51	10	14	8,714	0	0
				50 < HP <= 75	4	127	20	4	19	11,597	0	0
				75 < HP <= 100	7	213	34	6	31	19,446	0	0
				100 < HP <= 175	10	320	53	9	43	26,898	0	0
				175 < HP <= 300	16	492	81	13	67	41,415	0	0
				300 < HP <= 600	28	854	141	23	116	71,859	0	0
				600 < HP <= 750	49	1,494	246	41	203	125,675	1	0
				750 < HP <= 1000	68	2,036	319	55	263	162,695	1	0
				1000 < HP <= 1200	89	2,680	420	72	346	214,204	2	0
				1200 < HP <= 2000	106	3,180	498	86	411	254,112	2	0

#Name?

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Emission Factors by Horsepower, SCC, and Pollutant

All Fuels

Grams/Operating Hour

Orange County

Marina Park
2010 (Marina)

Total for year: 2009

Date of Model Run: Oct 14 15:54:24: 2008

Today's Date: 10/14/2008

Fuel Type	SCC	Equipment Description	Engine Type	Vapor Displacement THC	Spillage THC	Hot Soak THC	Running Loss THC	Tank Permeation THC	Hose Permeation THC	Total THC
			Horsepower							
Diesel										
Pleasure Craft										
2282020005		Inboard/Sterndrive	Diesel							
			6 < HP <= 11	0	0	0	0	0	0	4
			11 < HP <= 16	0	0	0	0	0	0	6
			16 < HP <= 25	0	0	0	0	0	0	8
			25 < HP <= 40	0	0	0	0	0	0	11
			40 < HP <= 50	0	0	0	0	0	0	15
			50 < HP <= 75	0	0	0	0	0	0	4
			75 < HP <= 100	0	0	0	0	0	0	7
			100 < HP <= 175	0	0	0	0	0	0	11
			175 < HP <= 300	0	0	0	0	0	0	16
			300 < HP <= 600	0	0	0	0	0	0	28
			600 < HP <= 750	0	0	0	0	0	0	50
			750 < HP <= 1000	0	0	0	0	0	0	69
			1000 < HP <= 1200	0	0	0	0	0	0	91
			1200 < HP <= 2000	0	0	0	0	0	0	108

#Name?

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Fuel Type	SCC	Equipment Description	Engine Type	Horsepower	Exhaust THC	Exhaust NOx	Exhaust CO	Exhaust PM10	Exhaust SO2	Exhaust CO2	Crankcase THC	Diurnal THC
			2000 < HP <= 3000		177	5,328	835	144	688	425,810	3	0
	2282020010	Outboards	Diesel									
			25 < HP <= 40		11	65	39	8	11	6,628	0	0
Gasoline												
Pleasure Craft												
	2282005010*	Outboard	2 Stroke									
			1 < HP <= 3		89	1	242	2	0	785	0	10
			3 < HP <= 6		200	3	374	4	0	1,685	0	25
			6 < HP <= 11		240	5	516	5	1	2,604	0	30
			11 < HP <= 16		346	9	769	7	1	4,436	0	30
			16 < HP <= 25		444	11	985	9	1	6,579	0	46
			25 < HP <= 40		645	20	1,537	13	2	9,463	0	46
			40 < HP <= 50		927	26	2,154	19	3	12,377	0	59
			50 < HP <= 75		881	41	2,599	18	3	15,142	0	87
			75 < HP <= 100		1,238	52	3,485	25	4	20,393	0	87
			100 < HP <= 175		1,911	89	5,313	38	6	28,427	0	144
			175 < HP <= 300		2,618	145	7,168	51	8	39,390	0	207
	2282005015*	Personal Water Craft	2 Stroke									
			1 < HP <= 3		31	1	208	0	0	566	0	2
			3 < HP <= 6		70	1	396	1	0	1,295	0	2
			6 < HP <= 11		124	8	444	3	1	2,476	0	2
			16 < HP <= 25		99	20	683	2	1	5,199	0	2
			25 < HP <= 40		146	42	1,277	3	2	9,704	0	4
			40 < HP <= 50		883	13	1,824	21	2	11,666	0	4

#Name?

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Fuel Type	SCC	Equipment Description	Engine Type Horsepower	Vapor Displacement THC	Spillage THC	Hot Soak THC	Running Loss THC	Tank Permeation THC	Hose Permeation THC	Total THC
			2000 < HP <= 3000	0	0	0	0	0	0	180
	2282020010	Outboards	Diesel							
			25 < HP <= 40	0	0	0	0	0	0	12
Gasoline										
Pleasure Craft										
	2282005010*	Outboard	2 Stroke							
			1 < HP <= 3	0	1	0	0	18	248	367
			3 < HP <= 6	1	1	0	0	36	248	510
			6 < HP <= 11	1	1	0	0	41	248	562
			11 < HP <= 16	2	2	0	0	41	248	669
			16 < HP <= 25	3	0	0	0	58	248	800
			25 < HP <= 40	4	0	3	0	49	132	880
			40 < HP <= 50	6	0	3	0	65	234	1,294
			50 < HP <= 75	7	0	3	0	100	244	1,323
			75 < HP <= 100	9	0	3	0	100	244	1,682
			100 < HP <= 175	13	0	3	0	174	345	2,592
			175 < HP <= 300	18	0	3	0	270	447	3,563
	2282005015*	Personal Water Craft	2 Stroke							
			1 < HP <= 3	0	0	3	3	15	39	93
			3 < HP <= 6	1	1	3	3	15	39	132
			6 < HP <= 11	1	1	3	3	15	39	187
			16 < HP <= 25	2	2	3	3	15	39	165
			25 < HP <= 40	4	0	3	3	25	48	234
			40 < HP <= 50	5	1	3	3	30	58	986

#Name?

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Fuel Type	SCC	Equipment Description	Engine Type	Horsepower	Exhaust THC	Exhaust NOx	Exhaust CO	Exhaust PM10	Exhaust SO2	Exhaust CO2	Crankcase THC	Diurnal THC
				50 < HP <= 75	1,521	21	3,193	32	4	18,352	0	6
				75 < HP <= 100	1,687	25	3,713	37	4	21,787	0	6
				100 < HP <= 175	969	70	4,168	19	5	22,925	0	8
				175 < HP <= 300	3,518	94	8,673	78	9	42,685	0	8
2282010005*		Inboard/Stern drive	4 Stroke									
				3 < HP <= 6	7	6	192	0	0	976	0	7
				6 < HP <= 11	14	11	385	0	0	1,951	0	12
				11 < HP <= 16	21	17	577	0	1	2,927	0	14
				25 < HP <= 40	43	35	1,172	0	1	5,946	0	39
				50 < HP <= 75	81	71	2,197	1	2	11,488	0	41
				75 < HP <= 100	0	0	0	0	0	0	0	0
				100 < HP <= 175	203	180	5,523	2	6	28,879	0	96
				175 < HP <= 300	247	293	6,643	3	8	39,215	0	125
				300 < HP <= 600	406	569	10,805	5	14	69,194	0	208
				600 < HP <= 750	759	851	20,432	9	24	117,944	0	195

* Under 25 horsepower spark-ignition engines are lumped into either 2- or 4-stroke.

#Name?

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Fuel Type	SCC	Equipment Description	Engine Type Horsepower	Vapor Displacement THC	Spillage THC	Hot Soak THC	Running Loss THC	Tank Permeation THC	Hose Permeation THC	Total THC
			50 < HP <= 75	9	1	3	3	40	77	1,660
			75 < HP <= 100	10	1	3	3	40	77	1,828
			100 < HP <= 175	10	1	3	3	47	97	1,137
			175 < HP <= 300	20	1	3	3	47	97	3,697
	2282010005*	Inboard/Stern drive	4 Stroke							
			3 < HP <= 6	0	1	3	3	12	54	87
			6 < HP <= 11	1	1	3	3	17	54	105
			11 < HP <= 16	1	1	3	3	20	54	117
			25 < HP <= 40	2	0	3	3	25	97	212
			50 < HP <= 75	4	0	3	3	45	171	349
			75 < HP <= 100	0	0	0	0	0	0	0
			100 < HP <= 175	11	0	3	0	108	245	667
			175 < HP <= 300	15	0	3	0	151	319	861
			300 < HP <= 600	27	0	3	0	269	393	1,306
			600 < HP <= 750	45	0	3	0	443	467	1,912

* Under 25 horsepower spark-ignition engines are lumped into either 2- or 4-stroke.

#Name?

page 6 of 6

Tugboat Emissions

Marina Park

2/24/2009

Prepared by Michael Brandman Associates

Assumptions

Propulsion Engine Power (kW)
Auxiliary Engine Power (kW)
Load Factor

Source

939 POLB, Table 3.1, Tugboat, Average
54 POLB, Table 3.2, Tugboat, Average
0.31 POLB, Table 3.8, Tugboat

Assumptions

Maximum hours per day 8 hours
Operating with auxiliary 40%
Operating with propulsion 60%
Days in operation 40

Zero Hour Emission Factors (g/kWh)

Engine Type	Year Min	Year Max	kW Max	PM	NOx	SO2	CO	HC	CO2	N2O	CH4	Source
Auxiliary	1997	2000	89	0.78	11.73	0.17	4.81	1.58	652	0.031	0.032	POLB, Appendix B
Propulsion	1987	1999	1417	0.67	17.4	0.17	4.01	1.13	652	0.031	0.023	POLB, Appendix B
Propulsion	2000	2007	1417	0.48	9.8	0.17	2.64	0.91	652	0.031	0.018	POLB, Appendix B
Propulsion	2007	2012	1417	0.27	7.41	0.17	5	0.91	652	0.031	0.018	POLB, Appendix B

Emissions (lbs/day)

Engine Type	Year Min	Year Max	kW Max	PM	NOx	SO2	CO	HC	CO2	N2O	CH4	PM2.5
Auxiliary	1997	2000	89	0.09	1.38	0.02	0.57	0.19	77	0.004	0.004	0.08
Propulsion	1987	1999	1417	2.06	53.49	0.52	12.33	3.47	2004	0.095	0.071	1.89
Propulsion	2000	2007	1417	1.48	30.12	0.52	8.12	2.80	2004	0.095	0.055	1.36
Propulsion	2007	2012	1417	0.83	22.78	0.52	15.37	2.80	2004	0.095	0.055	0.76

Emissions (MTCO2e/year)

Engine Type	Year Min	Year Max	kW Max
Auxiliary	1997	2000	89
Propulsion	1987	1999	1417
Propulsion	2000	2007	1417
Propulsion	2007	2012	1417

CO2	N2O	CH4
1	0.02	0.00
36	0.54	0.03
36	0.54	0.02
36	0.54	0.02

Emissions (tons/year)

CO2	N2O	CH4
2	0.00	0.00
40	0.00	0.00
40	0.00	0.00
40	0.00	0.00

Global Warming Potentials

310 N2O (nitrous oxide)
21 CH4 (methane)
1 CO2 (carbon dioxide)

Sources

POLB: Port of Long Beach, Air Emissions Inventory - 2007. January 2009. Prepared by Starcrest Consulting Group.
www.polb.com/environment/air_quality/emissions.asp

Notes

- Towboats/pushboats/tugboats are self-propelled vessels that tow or push barges within and outside of the port.
- The average year of the tugboat engines pursuant to the POLB Inventory is 1997 for the propulsion engines and 1998 for the auxiliary engine.
- PM2.5 is estimated as 92 percent of PM10 pursuant to SCAQMD Methodology to Calculate Particulate Matter (PM) 2.5 and PM2.5 Significance Thresholds, October 2006. The percentage was obtained from Appendix A, category "ships."
- Emissions = hours operating per day * percent operating with engine * emission factor (g/kWh) * conversion from grams to pounds (0.0022) * engine power (kW) * load factor
- MTCO2e = metric tons of carbon dioxide equivalent = tons multiplied by the global warming potential multiplied by 0.9072

Vialido_Results

CALINE4: CALIFORNIA LINE SOURCE DISPERSION MODEL
 JUNE 1989 VERSION
 PAGE 1

JOB: Newport and Via Lido
 RUN: Hour 1 (WORST CASE ANGLE)

POLLUTANT: Carbon Monoxide

I. SITE VARIABLES

U= 1.0 M/S Z0= 100. CM ALT= 2. (M)
 BRG= WORST CASE VD= .0 CM/S
 CLAS= 7 (G) VS= .0 CM/S
 MIXH= 1000. M AMB= .0 PPM
 SIGTH= 5. DEGREES TEMP= 15.6 DEGREE (C)

II. LINK VARIABLES

LINK DESCRIPTION	* X1	* Y1	* X2	* Y2	* TYPE	VPH	EF (G/MI)	H (M)	W (M)
A. NB External	18	0	18	600	AG	1465	4.2	.0	20.8
B. NB Approach	18	600	18	756	AG	1465	7.1	.0	20.8
C. NB Depart	18	756	18	911	AG	1745	7.1	.0	20.8
D. NB External	18	911	18	1511	AG	1745	4.2	.0	20.8
E. NB Left	18	600	9	756	AG	0	7.1	.0	20.8
F. SB Left	0	911	9	756	AG	580	7.1	.0	20.8
G. SB External	0	1511	0	911	AG	2684	4.2	.0	20.8
H. SB Approach	0	911	0	756	AG	2104	7.1	.0	20.8
I. SB Depart	0	756	0	600	AG	2124	7.1	.0	20.8
J. SB External	0	600	0	0	AG	2124	4.2	.0	20.8
K. EB External	-750	750	-150	750	AG	0	4.2	.0	14.4
L. EB Approach	-150	750	9	750	AG	0	7.1	.0	14.4
M. EB Depart	9	750	168	750	AG	610	7.1	.0	14.4
N. EB External	168	750	768	750	AG	610	4.2	.0	14.4
O. WB External	768	761	168	761	AG	330	4.2	.0	14.4
P. WB Approach	168	761	9	761	AG	310	7.1	.0	14.4
Q. WB Depart	9	761	-150	761	AG	0	7.1	.0	14.4
R. WB External	-150	761	-750	761	AG	0	7.1	.0	14.4
S. EB Left	-150	750	9	756	AG	0	7.1	.0	14.4
T. WB Left	168	761	9	756	AG	20	7.1	.0	14.4



CALINE4: CALIFORNIA LINE SOURCE DISPERSION MODEL
 JUNE 1989 VERSION
 PAGE 2

JOB: Newport and Via Lido
 RUN: Hour 1 (WORST CASE ANGLE)

POLLUTANT: Carbon Monoxide

III. RECEPTOR LOCATIONS

RECEPTOR	* X	* Y	* Z
1. Receptor	-12	741	2.0
2. Receptor	30	741	2.0
3. Receptor	30	770	2.0
4. Receptor	-12	770	2.0

IV. MODEL RESULTS (WORST CASE WIND ANGLE)

RECEPTOR	* BRG (DEG)	* CONC (PPM)	* A	* B	* C	CONC/LINK (PPM)				
						D	E	F	G	H
1. Receptor	7.	1.7	.0	.0	.1	.2	.0	.2	.1	1.0
2. Receptor	349.	1.7	.0	.1	.8	.0	.0	.2	.1	.3
3. Receptor	190.	1.4	.0	.7	.0	.0	.0	.0	.0	.0
4. Receptor	8.	1.7	.0	.0	.0	.2	.0	.2	.1	1.1

RECEPTOR	CONC/LINK (PPM)												
	I	J	K	L	M	N	O	P	Q	R	S	T	
1. Receptor	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	
2. Receptor	.0	.0	.0	.0	.1	.0	.0	.0	.0	.0	.0	.0	
3. Receptor	.3	.1	.0	.0	.1	.0	.0	.0	.0	.0	.0	.0	
4. Receptor	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	

Summary of Operational Greenhouse Gases

Unmitigated

Marina Park

Prepared by Michael Brandman Associates

Buildout Year 2010

Source	<i>Emissions (tons per year)</i>				Metric Tons CO2e
	Carbon Dioxide	Nitrous Oxide	Methane	Other	
Motor vehicles	1,047	0.15	0.31		999
Natural gas	72	0.00	0.00		65
Indirect electricity	117	0.00	0.00		106
Water transport	11	0.00	0.00		10
Refrigerants				0.23	276
Total	1,247	0.16	0.31	0.23	1457

Total	1,131	0.14	0.28	0.21 metric tons per year
GWP	1	310	21	varies
Total	1,131	44	6	276 MTCO2E per year
Total	0.0011	0.0000	0.0000	0.0003 MMTCO2E per year

Total - all gases
1,457 MTCO2e per year
0.0015 MMTCO2e per year

California emissions in 2004
Project percent of emissions
500 MMTCO2e per year
0.000291%

U.S. emissions in 2005
Project percent of emissions
7,260.4
0.000020%

Global emissions in 2004
Project percent of emissions
20135
0.000007%

Emissions converted from tons per year to metric tons of carbon dioxide equivalents (MTCO2e) per year by using the formula: (tons of gas) x (global warming potential) x (0.9072 metric tons)

Emissions converted to million metric tons of carbon dioxide equivalents (MMTCO2E) using the formula: MMTCO2e = (metric tons of gas) / (1,000,000).

Mobile Emissions - Methane**Unmitigated**

Page 1

Marina Park

15-Sep-08

Prepared by Michael Brandman Associates

Buildout Year 2010

Vehicle Miles Traveled

5,762

Starting Emissions	0.07 lbs/day	0.0000 tons/day	0.01 tons/year
Running Emissions	1.61 lbs/day	0.0008 tons/day	0.29 tons/year
Total	1.68 lbs/day	0.0008 tons/day	0.31 tons/year

Vehicle Percentages

Vehicle Type	Percent	Non-Catalyst	Catalyst	Diesel
Light Auto	54.7%	1.1%	98.7%	0.2%
Light Truck < 3,750 lbs	15.2%	2.0%	96.0%	2.0%
Light Truck 3,751- 5,750	16.2%	1.2%	98.1%	0.7%
Med Truck 5,751- 8,500	7.3%	1.4%	95.9%	2.7%
Lite-Heavy 8,501-10,000	1.1%	0.0%	81.8%	18.2%
Lite-Heavy 10,001-14,000	0.3%	0.0%	66.7%	33.3%
Med-Heavy 14,001-33,000	1.0%	0.0%	20.0%	80.0%
Heavy-Heavy 33,001-60,000	0.9%	0.0%	11.1%	88.9%
Line Haul > 60,000 lbs	0.0%	0.0%	0.0%	100.0%
Urban Bus	0.2%	0.0%	50.0%	50.0%
Motorcycle	1.6%	68.8%	31.2%	0.0%
School Bus	0.1%	0.0%	0.0%	100.0%
Motor Home	1.4%	7.1%	85.7%	7.2%

Running Emission Factors (g/mile)

Vehicle Type	Type	Non-Catalyst	Catalyst	Diesel
Light Auto	LDA	0.1931	0.1127	0.0161
Light Truck < 3,750 lbs	LDT1	0.2253	0.1448	0.0161
Light Truck 3,751- 5,750	LDT2	0.2253	0.1448	0.0161
Med Truck 5,751- 8,500	MDV	0.2253	0.1448	0.0161
Lite-Heavy 8,501-10,000	LHDT1	0.2012	0.1448	0.0805
Lite-Heavy 10,001-14,000	LHDT2	0.2012	0.1448	0.0805
Med-Heavy 14,001-33,000	MHDT	0.2012	0.1448	0.0805
Heavy-Heavy 33,001-60,000	HHDT	0.2012	0.1448	0.0805
Line Haul > 60,000 lbs	LHV	0.2012	0.1448	0.0805
Urban Bus	UB	0.2012	0.1448	0.0805
Motorcycle	MCY	0.2092	0.2092	0.2092
School Bus	SBUS	0.2012	0.1448	0.0805
Motor Home	MH	0.2012	0.1448	0.0805

Running Emissions (pounds per day)

Vehicle Type	Non-Catalyst	Catalyst	Diesel
Light Auto	0.01	0.77	0.00
Light Truck < 3,750 lbs	0.01	0.27	0.00
Light Truck 3,751- 5,750	0.01	0.29	0.00
Med Truck 5,751- 8,500	0.00	0.13	0.00
Lite-Heavy 8,501-10,000	0.00	0.02	0.00
Lite-Heavy 10,001-14,000	0.00	0.00	0.00
Med-Heavy 14,001-33,000	0.00	0.00	0.01
Heavy-Heavy 33,001-60,000	0.00	0.00	0.01
Line Haul > 60,000 lbs	0.00	0.00	0.00
Urban Bus	0.00	0.00	0.00
Motorcycle	0.03	0.01	0.00
School Bus	0.00	0.00	0.00
Motor Home	0.00	0.02	0.00
Total	0.06	1.52	0.02

Mobile Emissions - Methane

Marina Park
 Prepared by Michael Brandman Associates
 Buildout Year 2010

Total Trips 641

Starting Emission Factors (g/start)

Vehicle Type	Type	Non-Catalyst	Catalyst	Diesel
Light Auto	LDA	0.059	0.009	-0.003
Light Truck < 3,750 lbs	LDT1	0.067	0.099	-0.004
Light Truck 3,751- 5,750	LDT2	0.067	0.099	-0.004
Med Truck 5,751- 8,500	MDV	0.067	0.099	-0.004
Lite-Heavy 8,501-10,000	LHDT1	0.147	0.215	-0.004
Lite-Heavy 10,001-14,000	LHDT2	0.147	0.215	-0.004
Med-Heavy 14,001-33,000	MHDT	0.147	0.215	-0.004
Heavy-Heavy 33,001-60,000	HHDT	0.147	0.215	-0.004
Line Haul > 60,000 lbs	LHV	0.147	0.215	-0.004
Urban Bus	UB	0.147	0.215	-0.004
Motorcycle	MCY	0.024	0.024	0.033
School Bus	SBUS	0.147	0.215	-0.004
Motor Home	MH	0.147	0.215	-0.004

Trip Distribution

Vehicle Type	Type	Non-Catalyst	Catalyst	Diesel
Light Auto	LDA	3.9	346.2	0.7
Light Truck < 3,750 lbs	LDT1	1.9	93.6	1.9
Light Truck 3,751- 5,750	LDT2	1.2	101.9	0.7
Med Truck 5,751- 8,500	MDV	0.7	44.9	1.3
Lite-Heavy 8,501-10,000	LHDT1	0.0	5.8	1.3
Lite-Heavy 10,001-14,000	LHDT2	0.0	1.3	0.6
Med-Heavy 14,001-33,000	MHDT	0.0	1.3	5.1
Heavy-Heavy 33,001-60,000	HHDT	0.0	0.6	5.1
Line Haul > 60,000 lbs	LHV	0.0	0.0	0.0
Urban Bus	UB	0.0	0.6	0.6
Motorcycle	MCY	7.1	3.2	0.0
School Bus	SBUS	0.0	0.0	0.6
Motor Home	MH	0.6	7.7	0.6
Total		15.4	607.2	18.8

Starting Emissions (pounds per day)

Vehicle Type	Type	Non-Catalyst	Catalyst	Diesel
Light Auto	LDA	0.0005	0.0069	0.0000
Light Truck < 3,750 lbs	LDT1	0.0003	0.0204	0.0000
Light Truck 3,751- 5,750	LDT2	0.0002	0.0222	0.0000
Med Truck 5,751- 8,500	MDV	0.0001	0.0098	0.0000
Lite-Heavy 8,501-10,000	LHDT1	0.0000	0.0027	0.0000
Lite-Heavy 10,001-14,000	LHDT2	0.0000	0.0006	0.0000
Med-Heavy 14,001-33,000	MHDT	0.0000	0.0006	0.0000
Heavy-Heavy 33,001-60,000	HHDT	0.0000	0.0003	0.0000
Line Haul > 60,000 lbs	LHV	0.0000	0.0000	0.0000
Urban Bus	UB	0.0000	0.0003	0.0000
Motorcycle	MCY	0.0004	0.0002	0.0000
School Bus	SBUS	0.0000	0.0000	0.0000
Motor Home	MH	0.0002	0.0036	0.0000
Total		0.0016	0.0676	-0.0002

- Source of running emission factors: U.S. Environmental Protection Agency. Climate Leaders Greenhouse Gas Inventory Protocol, Core Module Guidance. Direct Emissions from Mobile Combustion Sources. October 2004.

- Source of vehicle percentages: URBEMIS2002 default values.

- Source of starting emissions: U.S. Environmental Protection Agency. Prepared by ICF Consulting. EPA420-P-04-016. Update of Methane and Nitrous Oxide Emission Factors for On-Highway Vehicles. November 2004.

Vehicle Miles Traveled 5,762

Starting Emissions	0.11 lbs/day	0.0001 tons/day	0.02 tons/year
Running Emissions	0.74 lbs/day	0.0004 tons/day	0.13 tons/year
Total	0.85 lbs/day	0.0004 tons/day	0.15 tons/year

Vehicle Percentages

Vehicle Type	Percent	Non-Catalyst	Catalyst	Diesel
Light Auto	54.7%	1.1%	98.7%	0.2%
Light Truck < 3,750 lbs	15.2%	2.0%	96.0%	2.0%
Light Truck 3,751- 5,750	16.2%	1.2%	98.1%	0.7%
Med Truck 5,751- 8,500	7.3%	1.4%	95.9%	2.7%
Lite-Heavy 8,501-10,000	1.1%	0.0%	81.8%	18.2%
Lite-Heavy 10,001-14,000	0.3%	0.0%	66.7%	33.3%
Med-Heavy 14,001-33,000	1.0%	0.0%	20.0%	80.0%
Heavy-Heavy 33,001-60,000	0.9%	0.0%	11.1%	88.9%
Line Haul > 60,000 lbs	0.0%	0.0%	0.0%	100.0%
Urban Bus	0.2%	0.0%	50.0%	50.0%
Motorcycle	1.6%	68.8%	31.2%	0.0%
School Bus	0.1%	0.0%	0.0%	100.0%
Motor Home	1.4%	7.1%	85.7%	7.2%

Running Emission Factors (g/mile)

Vehicle Type	Type	Non-Catalyst	Catalyst	Diesel
Light Auto	LDA	0.0166	0.0518	0.0161
Light Truck < 3,750 lbs	LDT1	0.0208	0.0649	0.0322
Light Truck 3,751- 5,750	LDT2	0.0208	0.0649	0.0322
Med Truck 5,751- 8,500	MDV	0.0208	0.0649	0.0322
Lite-Heavy 8,501-10,000	LHDT1	0.0480	0.1499	0.0483
Lite-Heavy 10,001-14,000	LHDT2	0.0480	0.1499	0.0483
Med-Heavy 14,001-33,000	MHDT	0.0480	0.1499	0.0483
Heavy-Heavy 33,001-60,000	HHDT	0.0480	0.1499	0.0483
Line Haul > 60,000 lbs	LHV	0.0480	0.1499	0.0483
Urban Bus	UB	0.0480	0.1499	0.0483
Motorcycle	MCY	0.0073	0.0073	0.0073
School Bus	SBUS	0.0480	0.1499	0.0483
Motor Home	MH	0.0480	0.1499	0.0483

Running Emissions (pounds per day)

Vehicle Type	Non-Catalyst	Catalyst	Diesel
Light Auto	0.00	0.35	0.00
Light Truck < 3,750 lbs	0.00	0.12	0.00
Light Truck 3,751- 5,750	0.00	0.13	0.00
Med Truck 5,751- 8,500	0.00	0.06	0.00
Lite-Heavy 8,501-10,000	0.00	0.02	0.00
Lite-Heavy 10,001-14,000	0.00	0.00	0.00
Med-Heavy 14,001-33,000	0.00	0.00	0.00
Heavy-Heavy 33,001-60,000	0.00	0.00	0.00
Line Haul > 60,000 lbs	0.00	0.00	0.00
Urban Bus	0.00	0.00	0.00
Motorcycle	0.00	0.00	0.00
School Bus	0.00	0.00	0.00
Motor Home	0.00	0.02	0.00
Total	0.00	0.71	0.02

Mobile Emissions - Nitrous Oxide

Marina Park

Prepared by Michael Brandman Associates

Buildout Year 2010

Total Trips

641

Starting Emission Factors (g/start)

Vehicle Type	Type	Non-Catalyst	Catalyst	Diesel
Light Auto	LDA	0.028	0.072	0.000
Light Truck < 3,750 lbs	LDT1	0.032	0.093	-0.001
Light Truck 3,751- 5,750	LDT2	0.032	0.093	-0.001
Med Truck 5,751- 8,500	MDV	0.032	0.093	-0.001
Lite-Heavy 8,501-10,000	LHDT1	0.070	0.194	-0.002
Lite-Heavy 10,001-14,000	LHDT2	0.070	0.194	-0.002
Med-Heavy 14,001-33,000	MHDT	0.070	0.194	-0.002
Heavy-Heavy 33,001-60,000	HHDT	0.070	0.194	-0.002
Line Haul > 60,000 lbs	LHV	0.070	0.194	-0.002
Urban Bus	UB	0.070	0.194	-0.002
Motorcycle	MCY	0.012	0.012	0.012
School Bus	SBUS	0.070	0.194	-0.002
Motor Home	MH	0.070	0.194	-0.002

Trip Distribution

Vehicle Type	Type	Non-Catalyst	Catalyst	Diesel
Light Auto	LDA	3.9	346.2	0.7
Light Truck < 3,750 lbs	LDT1	1.9	93.6	1.9
Light Truck 3,751- 5,750	LDT2	1.2	101.9	0.7
Med Truck 5,751- 8,500	MDV	0.7	44.9	1.3
Lite-Heavy 8,501-10,000	LHDT1	0.0	5.8	1.3
Lite-Heavy 10,001-14,000	LHDT2	0.0	1.3	0.6
Med-Heavy 14,001-33,000	MHDT	0.0	1.3	5.1
Heavy-Heavy 33,001-60,000	HHDT	0.0	0.6	5.1
Line Haul > 60,000 lbs	LHV	0.0	0.0	0.0
Urban Bus	UB	0.0	0.6	0.6
Motorcycle	MCY	7.1	3.2	0.0
School Bus	SBUS	0.0	0.0	0.6
Motor Home	MH	0.6	7.7	0.6
Total		15.4	607.2	18.8

Starting Emissions (pounds per day)

Vehicle Type	Type	Non-Catalyst	Catalyst	Diesel
Light Auto	LDA	0.0002	0.0548	0.0000
Light Truck < 3,750 lbs	LDT1	0.0001	0.0191	0.0000
Light Truck 3,751- 5,750	LDT2	0.0001	0.0209	0.0000
Med Truck 5,751- 8,500	MDV	0.0000	0.0092	0.0000
Lite-Heavy 8,501-10,000	LHDT1	0.0000	0.0025	0.0000
Lite-Heavy 10,001-14,000	LHDT2	0.0000	0.0005	0.0000
Med-Heavy 14,001-33,000	MHDT	0.0000	0.0005	0.0000
Heavy-Heavy 33,001-60,000	HHDT	0.0000	0.0003	0.0000
Line Haul > 60,000 lbs	LHV	0.0000	0.0000	0.0000
Urban Bus	UB	0.0000	0.0003	0.0000
Motorcycle	MCY	0.0002	0.0001	0.0000
School Bus	SBUS	0.0000	0.0000	0.0000
Motor Home	MH	0.0001	0.0033	0.0000
Total		0.0008	0.1115	-0.0001

- Source of running emission factors: U.S. Environmental Protection Agency. Climate Leaders Greenhouse Gas Inventory Protocol, Core Module Guidance. Direct Emissions from Mobile Combustion Sources. October 2004.

- Source of vehicle percentages: URBEMIS2002 default values.

- Source of starting emissions: U.S. Environmental Protection Agency. Prepared by ICF Consulting. EPA420-P-04-016. Update of Methane and Nitrous Oxide Emission Factors for On-Highway Vehicles. November 2004.

Electricity - Indirect Emissions

Project: Marina Park
 Prepared by: Michael Brandman Associates
 Prepared on: 9/15/2008

Land Use	square feet (sf)	Electricity Use (kWh/sf-year)*	Electricity Use (kWh/year)
Community Center	21300	13.63	290319
			0
			0
			0
Total			290319
			290 MWh/year

Greenhouse Gas	Emission Factor (pounds per MWh/year)	Emissions (pounds/year)	Emissions (tons/year)
Carbon dioxide	804.54	233,573	117
Methane	0.0067	2	0.001
Nitrous oxide	0.0037	1	0.001

Emission factor source: California Climate Action Registry. General Reporting Protocol. Reporting Entity-Wide Greenhouse Gas Emissions. Version 2.2, March 2007. www.climateregistry.org

Residential electricity usage rate: 5626.50 kwh/unit/year, from South Coast Air Quality Management 1993 CEQA Handbook, Table 9-11-A

* Table E-1 from California Energy Commission. California Commercial End-Use Survey. Consultant Report. March 2006. CEC-400-2006-005

Table E-1: Overview of Energy Usage in the Statewide Service Area

Building Type	Floor Stock (kft ²)	Annual Energy Intensities			Total Annual Usage	
		Electricity (kWh/ft ²)	Natural Gas (therm/ft ²)	Natural Gas (kBtu/ft ²)	Electricity (GWh)	Natural Gas (Mtherms)
All Commercial	4,920,114	13.63	0.26	25.99	67077	1278.60
Small Office (<30k ft ²)	361,584	13.10	0.11	10.54	4738	38.10
Large Office (>=30k ft ²)	660,429	17.70	0.22	21.93	11691	144.80
Restaurant	148,892	40.20	2.10	209.98	5986	312.60
Retail	702,053	14.06	0.05	4.62	9871	32.50
Food Store	144,209	40.99	0.28	27.60	5911	39.80
Refrigerated Warehouse	95,540	20.02	0.06	5.60	1913	5.30
Unrefrigerated Warehouse	554,166	4.45	0.03	3.07	2467	17.00
School	445,106	7.46	0.16	15.97	3322	71.10
College	205,942	12.26	0.34	34.24	2524	70.50
Health	232,606	19.61	0.76	75.53	4561	175.70
Lodging	270,044	12.13	0.42	42.40	3275	114.50
Miscellaneous	1,099,544	9.84	0.23	23.34	10817	256.60
All Offices	1,022,012	16.08	0.18	17.90	16430	182.90
All Warehouses	649,706	6.74	0.03	3.44	4380	22.40

Electricity Use in Typical Urban Water Systems

Project: Marina Park
 Prepared by: Michael Brandman Associates
 Prepared on: 9/15/2008

	kWh/MG	
	Northern California	Southern California
Water Supply and Conveyance	150	8,900
Water Treatment	100	100
Water Distribution	1,200	1,200
Wastewater Treatment	2,500	2,500
Totals	3,950	12,700

From California's Water Energy Relationship, CEC 2005

	Gallons per day	Millions Gallons (MG) per year	kWh	MWh
	Water Usage	6000	2.19	27,813
Energy Usage				

Greenhouse Gas	Indirect Electricity Emission Factor		
	(pounds per MWh/year)	Emissions (pounds/year)	Emissions (tons/year)
Carbon dioxide	804.54	22,377	11
Methane	0.0067	0.19	0.000
Nitrous oxide	0.0037	0.10	0.000

Emission factor for electricity source:
 California Climate Action Registry. General Reporting Protocol. Reporting Entity-Wide
 Greenhouse Gas Emissions. Version 2.2, March 2007. www.climateregistry.org

CEC 2005: California Energy Commission. California's Energy-Water Relationship.
 Final Staff Report. November 2005. CEC-700-2005-011-SF

Natural Gas Combustion

Marina Park

Prepared by Michael Brandman Associates

9/15/2008

Gas	Type of Land Use	Square Feet or Units	Natural Gas Usage Factor* (SCF/square foot or unit/month)	Natural Gas Usage for Project (SCF/month)	Natural Gas usage for Project (SCF/year)	Emission Factor (g CO2/SCF)**	Emission Factor (g/MMBTU)**	Heating Value of Natural Gas (BTU/SCF)**	Emissions (tons per year)	Emissions (pounds per day)
Methane	Office	21300	2.0	42600	511200	N/A	4.75	1020	0.00	0.01
	Retail/Shopping	0	2.9	0	0	N/A	4.75	1020	0.00	0.00
	Residential	0	6665	0	0	N/A	4.75	1020	0.00	0.00
	Industrial		241611	0	0	N/A	4.75	1020	0.00	0.00
	Multi-family	0	4011.5	0	0	N/A	4.75	1020	0.00	0.00
Nitrous Oxide	Office	21300	2.0	42600	511200	N/A	0.095	1020	0.00	0.00
	Retail/Shopping	0	2.9	0	0	N/A	0.095	1020	0.00	0.00
	Residential	0	6665	0	0	N/A	0.095	1020	0.00	0.00
	Industrial		241611	0	0	N/A	0.095	1020	0.00	0.00
	Multi-family	0	4011.5	0	0	N/A	0.095	1020	0.00	0.00

Total

Units	Nitrous Oxide	Methane
pounds per day	0.00	0.01
tons per year	0.00	0.00
Global warming potential	310	21
MTCO2e/year	0.000000	0.000000

* Natural gas usage factor from URBEMIS2002 default; Industrial is based on number of buildings

** USEPA, 2004: Direct Emissions from Stationary Combustion Sources, Climate Leaders Greenhouse Inventory Protocol, Core Model Guidance, October 2004

Emissions of CH4, N2O = Emission Factor x Heating Value of Natural Gas x Natural Gas Usage x Number of Units/Square Feet

Air Conditioning and Refrigeration Fugitive Emissions

Project: Marina Park
 Prepared by: Michael Brandman Associates
 Prepared on: 9/15/2008

Type of Unit	Units	Capacity of Unit (kg)	Annual Leak Rate in percent of capacity	Emissions (kg/year)	Emissions (tons/year)	Global Warming Potential	Metric Tons CO2 Equiv./year
Domestic Refrigeration		0.5	0.5%	0	0.000	1300	0
Commercial Refrigeration		1000	35.0%	0	0.000	1300	0
Residential A/C		50	10%	0	0	1300	0
Office A/C	21.3	100	10%	213	0.2343	1300	276
Commercial A/C		100	10%	0.0	0.000	1300	0
Industrial A/C		100	10%	0	0	1300	0
Total					0.234		276

Source:
 U.S. Environmental Protection Agency, Climate Leaders. May 2008. Direct HFC and PFC Emissions from Use of Refrigeration and Air Conditioning Equipment. EPA430-K-03-004. <http://www.epa.gov/stateply/documents/resources/mfgrfg.pdf>, Accessed in July 2008.

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Urbemis 2007 Version 9.2.4

Combined Annual Emissions Reports (Tons/Year)

File Name: C:\MBA\Client\00640022 Marina Park\Marina Park.urb924

Project Name: Marina Park

Project Location: South Coast AQMD

On-Road Vehicle Emissions Based on: Version : Emfac2007 V2.3 Nov 1 2006

Off-Road Vehicle Emissions Based on: OFFROAD2007

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Summary Report:

CONSTRUCTION EMISSION ESTIMATES

	<u>PM2.5 Dust</u>	<u>PM2.5 Exhaust</u>	<u>PM2.5</u>	<u>CO2</u>
2009 TOTALS (tons/year unmitigated)	0.24	0.20	0.44	472.07
2009 TOTALS (tons/year mitigated)	0.04	0.20	0.24	472.07
Percent Reduction	81.61	0.00	44.06	0.00

AREA SOURCE EMISSION ESTIMATES

	<u>PM2.5</u>	<u>CO2</u>
TOTALS (tons/year, unmitigated)	0.00	73.52

OPERATIONAL (VEHICLE) EMISSION ESTIMATES

	<u>PM2.5</u>	<u>CO2</u>
TOTALS (tons/year, unmitigated)	0.36	1,046.69

SUM OF AREA SOURCE AND OPERATIONAL EMISSION ESTIMATES

	<u>PM2.5</u>	<u>CO2</u>
TOTALS (tons/year, unmitigated)	0.36	1,120.21

Construction Unmitigated Detail Report:

CONSTRUCTION EMISSION ESTIMATES Annual Tons Per Year, Unmitigated

	<u>PM2.5 Dust</u>	<u>PM2.5 Exhaust</u>	<u>PM2.5</u>	<u>CO2</u>
2009	0.24	0.20	0.44	472.07
Demolition 01/05/2009-01/16/2009	0.00	0.00	0.00	5.79
Fugitive Dust	0.00	0.00	0.00	0.00
Demo Off Road Diesel	0.00	0.00	0.00	4.28
Demo On Road Diesel	0.00	0.00	0.00	0.88
Demo Worker Trips	0.00	0.00	0.00	0.62
Mass Grading 01/19/2009-03/13/2009	0.21	0.05	0.26	109.81
Mass Grading Dust	0.21	0.00	0.21	0.00
Mass Grading Off Road Diesel	0.00	0.04	0.04	92.12
Mass Grading On Road Diesel	0.00	0.00	0.00	12.72
Mass Grading Worker Trips	0.00	0.00	0.00	4.98
Trenching 03/16/2009-03/31/2009	0.00	0.01	0.01	13.27
Trenching Off Road Diesel	0.00	0.01	0.01	12.53
Trenching Worker Trips	0.00	0.00	0.00	0.75
Building 04/01/2009-12/24/2009	0.00	0.12	0.12	301.36
Building Off Road Diesel	0.00	0.11	0.11	155.63
Building Vendor Trips	0.00	0.00	0.00	9.70
Building Worker Trips	0.00	0.00	0.01	136.03

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Fine Grading 04/01/2009-04/30/2009	0.02	0.01	0.04	26.09
Fine Grading Dust	0.02	0.00	0.02	0.00
Fine Grading Off Road Diesel	0.00	0.01	0.01	24.72
Fine Grading On Road Diesel	0.00	0.00	0.00	0.00
Fine Grading Worker Trips	0.00	0.00	0.00	1.37
Asphalt 12/01/2009-12/24/2009	0.00	0.01	0.01	14.97
Paving Off-Gas	0.00	0.00	0.00	0.00
Paving Off Road Diesel	0.00	0.01	0.01	11.45
Paving On Road Diesel	0.00	0.00	0.00	1.29
Paving Worker Trips	0.00	0.00	0.00	2.24
Coating 12/01/2009-12/24/2009	0.00	0.00	0.00	0.77
Architectural Coating	0.00	0.00	0.00	0.00
Coating Worker Trips	0.00	0.00	0.00	0.77

Phase Assumptions

Phase: Demolition 1/5/2009 - 1/16/2009 - Demolition

Building Volume Total (cubic feet): 30000

Building Volume Daily (cubic feet): 3000

On Road Truck Travel (VMT): 41.67

Off-Road Equipment:

- 1 Concrete/Industrial Saws (10 hp) operating at a 0.73 load factor for 8 hours per day
- 1 Rubber Tired Dozers (357 hp) operating at a 0.59 load factor for 2 hours per day
- 2 Tractors/Loaders/Backhoes (108 hp) operating at a 0.55 load factor for 6 hours per day

Phase: Fine Grading 4/1/2009 - 4/30/2009 - Fine grading

Total Acres Disturbed: 2

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Maximum Daily Acreage Disturbed: 1

Fugitive Dust Level of Detail: Default

10 lbs per acre-day

On Road Truck Travel (VMT): 0

Off-Road Equipment:

1 Graders (174 hp) operating at a 0.61 load factor for 6 hours per day

1 Rubber Tired Dozers (357 hp) operating at a 0.59 load factor for 6 hours per day

1 Tractors/Loaders/Backhoes (108 hp) operating at a 0.55 load factor for 7 hours per day

1 Water Trucks (189 hp) operating at a 0.5 load factor for 8 hours per day

Phase: Mass Grading 1/19/2009 - 3/13/2009 - Mass grading

Total Acres Disturbed: 10

Maximum Daily Acreage Disturbed: 5

Fugitive Dust Level of Detail: Default

10 lbs per acre-day

On Road Truck Travel (VMT): 150

Off-Road Equipment:

1 Aerial Lifts (60 hp) operating at a 0.46 load factor for 6 hours per day

1 Graders (174 hp) operating at a 0.61 load factor for 6 hours per day

2 Other Equipment (190 hp) operating at a 0.62 load factor for 8 hours per day

2 Rubber Tired Dozers (357 hp) operating at a 0.59 load factor for 6 hours per day

1 Tractors/Loaders/Backhoes (108 hp) operating at a 0.55 load factor for 7 hours per day

1 Water Trucks (189 hp) operating at a 0.5 load factor for 6 hours per day

Phase: Trenching 3/16/2009 - 3/31/2009 - Trenching

Off-Road Equipment:

2 Excavators (168 hp) operating at a 0.57 load factor for 8 hours per day

1 Other Material Handling Equipment (191 hp) operating at a 0.59 load factor for 8 hours per day

1 Tractors/Loaders/Backhoes (108 hp) operating at a 0.55 load factor for 8 hours per day

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Phase: Paving 12/1/2009 - 12/24/2009 - Paving

Acres to be Paved: 1.69

Off-Road Equipment:

- 4 Cement and Mortar Mixers (10 hp) operating at a 0.56 load factor for 6 hours per day
- 1 Pavers (100 hp) operating at a 0.62 load factor for 7 hours per day
- 1 Paving Equipment (104 hp) operating at a 0.53 load factor for 8 hours per day
- 1 Rollers (95 hp) operating at a 0.56 load factor for 7 hours per day
- 1 Tractors/Loaders/Backhoes (108 hp) operating at a 0.55 load factor for 7 hours per day

Phase: Building Construction 4/1/2009 - 12/24/2009 - Default Building Construction Description

Off-Road Equipment:

- 1 Cranes (399 hp) operating at a 0.43 load factor for 6 hours per day
- 2 Forklifts (145 hp) operating at a 0.3 load factor for 6 hours per day
- 1 Generator Sets (49 hp) operating at a 0.74 load factor for 8 hours per day
- 1 Tractors/Loaders/Backhoes (108 hp) operating at a 0.55 load factor for 8 hours per day
- 3 Welders (45 hp) operating at a 0.45 load factor for 8 hours per day

Phase: Architectural Coating 12/1/2009 - 12/24/2009 - Default Architectural Coating Description

- Rule: Residential Interior Coatings begins 1/1/2005 ends 6/30/2008 specifies a VOC of 100
- Rule: Residential Interior Coatings begins 7/1/2008 ends 12/31/2040 specifies a VOC of 50
- Rule: Residential Exterior Coatings begins 1/1/2005 ends 6/30/2008 specifies a VOC of 250
- Rule: Residential Exterior Coatings begins 7/1/2008 ends 12/31/2040 specifies a VOC of 100
- Rule: Nonresidential Interior Coatings begins 1/1/2005 ends 12/31/2040 specifies a VOC of 250
- Rule: Nonresidential Exterior Coatings begins 1/1/2005 ends 12/31/2040 specifies a VOC of 250

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Area Source Unmitigated Detail Report:

AREA SOURCE EMISSION ESTIMATES Annual Tons Per Year, Unmitigated

<u>Source</u>	<u>PM2.5</u>	<u>CO2</u>
Natural Gas	0.00	71.98
Hearth	0.00	0.00
Landscape	0.00	1.54
Consumer Products		
Architectural Coatings		
TOTALS (tons/year, unmitigated)	0.00	73.52

Area Source Changes to Defaults

Operational Unmitigated Detail Report:

OPERATIONAL EMISSION ESTIMATES Annual Tons Per Year, Unmitigated

<u>Source</u>	<u>PM25</u>	<u>CO2</u>
City park	0.04	117.34
Community Center/Sailing Center/Cafe	0.27	794.27
Visitor Marina - Berths	0.05	135.08
TOTALS (tons/year, unmitigated)	0.36	1,046.69

Operational Settings:

Does not include correction for passby trips

Does not include double counting adjustment for internal trips

Analysis Year: 2010 Season: Annual

Emfac: Version : Emfac2007 V2.3 Nov 1 2006

Summary of Land Uses

Land Use Type	Acreage	Trip Rate	Unit Type	No. Units	Total Trips	Total VMT
City park		15.80	acres	4.50	71.10	645.77
Community Center/Sailing Center/Cafe		22.88	1000 sq ft	21.30	487.34	4,372.94
Visitor Marina - Berths		2.96	1000 sq ft	28.00	82.88	743.68
					641.32	5,762.39

Vehicle Fleet Mix

Vehicle Type	Percent Type	Non-Catalyst	Catalyst	Diesel
Light Auto	51.7	1.2	98.6	0.2
Light Truck < 3750 lbs	7.3	2.7	94.6	2.7
Light Truck 3751-5750 lbs	22.9	0.4	99.6	0.0
Med Truck 5751-8500 lbs	10.6	0.9	99.1	0.0
Lite-Heavy Truck 8501-10,000 lbs	1.6	0.0	81.2	18.8
Lite-Heavy Truck 10,001-14,000 lbs	0.5	0.0	60.0	40.0
Med-Heavy Truck 14,001-33,000 lbs	0.9	0.0	22.2	77.8
Heavy-Heavy Truck 33,001-60,000 lbs	0.5	0.0	0.0	100.0
Other Bus	0.1	0.0	0.0	100.0
Urban Bus	0.1	0.0	0.0	100.0
Motorcycle	2.8	67.9	32.1	0.0
School Bus	0.1	0.0	0.0	100.0

Vehicle Fleet Mix

Vehicle Type	Percent Type	Non-Catalyst	Catalyst	Diesel
Motor Home	0.9	0.0	88.9	11.1

Travel Conditions

	Residential			Commuter	Commercial	
	Home-Work	Home-Shop	Home-Other		Non-Work	Customer
Urban Trip Length (miles)	12.7	7.0	9.5	13.3	7.4	8.9
Rural Trip Length (miles)	17.6	12.1	14.9	15.4	9.6	12.6
Trip speeds (mph)	30.0	30.0	30.0	30.0	30.0	30.0
% of Trips - Residential	32.9	18.0	49.1			
% of Trips - Commercial (by land use)						
City park				5.0	2.5	92.5
Community Center/Sailing Center/Cafe				2.0	1.0	97.0
Visitor Marina - Berths				2.0	1.0	97.0

Operational Changes to Defaults

Existing Emissions

Mobile Emissions - Methane

Unmitigated

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Marina Park-Existing Uses

15-Sep-08

Prepared by Michael Brandman Associates

Buildout Year 2008

Vehicle Miles Traveled

1,958

Starting Emissions	0.02 lbs/day	0.0000 tons/day	0.00
Running Emissions	0.55 lbs/day	0.0003 tons/day	0.10
Total	0.57 lbs/day	0.0003 tons/day	0.10

Vehicle Percentages

Vehicle Type	Percent	Non-Catalyst	Catalyst	Diesel
Light Auto	54.7%	1.1%	98.7%	0.2%
Light Truck < 3,750 lbs	15.2%	2.0%	96.0%	2.0%
Light Truck 3,751- 5,750	16.2%	1.2%	98.1%	0.7%
Med Truck 5,751- 8,500	7.3%	1.4%	95.9%	2.7%
Lite-Heavy 8,501-10,000	1.1%	0.0%	81.8%	18.2%
Lite-Heavy 10,001-14,000	0.3%	0.0%	66.7%	33.3%
Med-Heavy 14,001-33,000	1.0%	0.0%	20.0%	80.0%
Heavy-Heavy 33,001-60,000	0.9%	0.0%	11.1%	88.9%
Line Haul > 60,000 lbs	0.0%	0.0%	0.0%	100.0%
Urban Bus	0.2%	0.0%	50.0%	50.0%
Motorcycle	1.6%	68.8%	31.2%	0.0%
School Bus	0.1%	0.0%	0.0%	100.0%
Motor Home	1.4%	7.1%	85.7%	7.2%

Running Emission Factors (g/mile)

Vehicle Type	Type	Non-Catalyst	Catalyst	Diesel
Light Auto	LDA	0.1931	0.1127	0.0161
Light Truck < 3,750 lbs	LDT1	0.2253	0.1448	0.0161
Light Truck 3,751- 5,750	LDT2	0.2253	0.1448	0.0161
Med Truck 5,751- 8,500	MDV	0.2253	0.1448	0.0161
Lite-Heavy 8,501-10,000	LHDT1	0.2012	0.1448	0.0805
Lite-Heavy 10,001-14,000	LHDT2	0.2012	0.1448	0.0805
Med-Heavy 14,001-33,000	MHDT	0.2012	0.1448	0.0805
Heavy-Heavy 33,001-60,000	HHDT	0.2012	0.1448	0.0805
Line Haul > 60,000 lbs	LHV	0.2012	0.1448	0.0805
Urban Bus	UB	0.2012	0.1448	0.0805
Motorcycle	MCY	0.2092	0.2092	0.2092
School Bus	SBUS	0.2012	0.1448	0.0805
Motor Home	MH	0.2012	0.1448	0.0805

Running Emissions (pounds per day)

Vehicle Type	Non-Catalyst	Catalyst	Diesel
Light Auto	0.01	0.26	0.00
Light Truck < 3,750 lbs	0.00	0.09	0.00
Light Truck 3,751- 5,750	0.00	0.10	0.00
Med Truck 5,751- 8,500	0.00	0.04	0.00
Lite-Heavy 8,501-10,000	0.00	0.01	0.00
Lite-Heavy 10,001-14,000	0.00	0.00	0.00
Med-Heavy 14,001-33,000	0.00	0.00	0.00
Heavy-Heavy 33,001-60,000	0.00	0.00	0.00
Line Haul > 60,000 lbs	0.00	0.00	0.00
Urban Bus	0.00	0.00	0.00
Motorcycle	0.01	0.00	0.00
School Bus	0.00	0.00	0.00
Motor Home	0.00	0.01	0.00
Total	0.02	0.52	0.01

Mobile Emissions - Methane

Marina Park-Existing Uses
 Prepared by Michael Brandman Associates
 Buildout Year 2008

Total Trips 194

Starting Emission Factors (g/start)

Vehicle Type	Type	Non-Catalyst	Catalyst	Diesel
Light Auto	LDA	0.059	0.009	-0.003
Light Truck < 3,750 lbs	LDT1	0.067	0.099	-0.004
Light Truck 3,751- 5,750	LDT2	0.067	0.099	-0.004
Med Truck 5,751- 8,500	MDV	0.067	0.099	-0.004
Lite-Heavy 8,501-10,000	LHDT1	0.147	0.215	-0.004
Lite-Heavy 10,001-14,000	LHDT2	0.147	0.215	-0.004
Med-Heavy 14,001-33,000	MHDT	0.147	0.215	-0.004
Heavy-Heavy 33,001-60,000	HHDT	0.147	0.215	-0.004
Line Haul > 60,000 lbs	LHV	0.147	0.215	-0.004
Urban Bus	UB	0.147	0.215	-0.004
Motorcycle	MCY	0.024	0.024	0.033
School Bus	SBUS	0.147	0.215	-0.004
Motor Home	MH	0.147	0.215	-0.004

Trip Distribution

Vehicle Type	Type	Non-Catalyst	Catalyst	Diesel
Light Auto	LDA	1.2	104.6	0.2
Light Truck < 3,750 lbs	LDT1	0.6	28.3	0.6
Light Truck 3,751- 5,750	LDT2	0.4	30.8	0.2
Med Truck 5,751- 8,500	MDV	0.2	13.6	0.4
Lite-Heavy 8,501-10,000	LHDT1	0.0	1.7	0.4
Lite-Heavy 10,001-14,000	LHDT2	0.0	0.4	0.2
Med-Heavy 14,001-33,000	MHDT	0.0	0.4	1.6
Heavy-Heavy 33,001-60,000	HHDT	0.0	0.2	1.6
Line Haul > 60,000 lbs	LHV	0.0	0.0	0.0
Urban Bus	UB	0.0	0.2	0.2
Motorcycle	MCY	2.1	1.0	0.0
School Bus	SBUS	0.0	0.0	0.2
Motor Home	MH	0.2	2.3	0.2
Total		4.7	183.5	5.7

Starting Emissions (pounds per day)

Vehicle Type	Type	Non-Catalyst	Catalyst	Diesel
Light Auto	LDA	0.0002	0.0021	0.0000
Light Truck < 3,750 lbs	LDT1	0.0001	0.0062	0.0000
Light Truck 3,751- 5,750	LDT2	0.0001	0.0067	0.0000
Med Truck 5,751- 8,500	MDV	0.0000	0.0030	0.0000
Lite-Heavy 8,501-10,000	LHDT1	0.0000	0.0008	0.0000
Lite-Heavy 10,001-14,000	LHDT2	0.0000	0.0002	0.0000
Med-Heavy 14,001-33,000	MHDT	0.0000	0.0002	0.0000
Heavy-Heavy 33,001-60,000	HHDT	0.0000	0.0001	0.0000
Line Haul > 60,000 lbs	LHV	0.0000	0.0000	0.0000
Urban Bus	UB	0.0000	0.0001	0.0000
Motorcycle	MCY	0.0001	0.0001	0.0000
School Bus	SBUS	0.0000	0.0000	0.0000
Motor Home	MH	0.0001	0.0011	0.0000
Total		0.0005	0.0204	0.0000

- Source of running emission factors: U.S. Environmental Protection Agency. Climate Leaders Greenhouse Gas Inventory Protocol, Core Module Guidance. Direct Emissions from Mobile Combustion Sources. October 2004.
 - Source of vehicle percentages: URBEMIS2002 default values.
 - Source of starting emissions: U.S. Environmental Protection Agency. Prepared by ICF Consulting. EPA420-P-04-016. Update of Methane and Nitrous Oxide Emission Factors for On-Highway Vehicles. November 2004.

Vehicle Miles Traveled 1,958

Starting Emissions	0.03 lbs/day	0.0000 tons/day	0.01 tons/year
Running Emissions	0.25 lbs/day	0.0001 tons/day	0.05 tons/year
Total	0.28 lbs/day	0.0001 tons/day	0.05 tons/year

Vehicle Percentages

Vehicle Type	Percent	Non-Catalyst	Catalyst	Diesel
Light Auto	54.7%	1.1%	98.7%	0.2%
Light Truck < 3,750 lbs	15.2%	2.0%	96.0%	2.0%
Light Truck 3,751- 5,750	16.2%	1.2%	98.1%	0.7%
Med Truck 5,751- 8,500	7.3%	1.4%	95.9%	2.7%
Lite-Heavy 8,501-10,000	1.1%	0.0%	81.8%	18.2%
Lite-Heavy 10,001-14,000	0.3%	0.0%	66.7%	33.3%
Med-Heavy 14,001-33,000	1.0%	0.0%	20.0%	80.0%
Heavy-Heavy 33,001-60,000	0.9%	0.0%	11.1%	88.9%
Line Haul > 60,000 lbs	0.0%	0.0%	0.0%	100.0%
Urban Bus	0.2%	0.0%	50.0%	50.0%
Motorcycle	1.6%	68.8%	31.2%	0.0%
School Bus	0.1%	0.0%	0.0%	100.0%
Motor Home	1.4%	7.1%	85.7%	7.2%

Running Emission Factors (g/mile)

Vehicle Type	Type	Non-Catalyst	Catalyst	Diesel
Light Auto	LDA	0.0166	0.0518	0.0161
Light Truck < 3,750 lbs	LDT1	0.0208	0.0649	0.0322
Light Truck 3,751- 5,750	LDT2	0.0208	0.0649	0.0322
Med Truck 5,751- 8,500	MDV	0.0208	0.0649	0.0322
Lite-Heavy 8,501-10,000	LHDT1	0.0480	0.1499	0.0483
Lite-Heavy 10,001-14,000	LHDT2	0.0480	0.1499	0.0483
Med-Heavy 14,001-33,000	MHDT	0.0480	0.1499	0.0483
Heavy-Heavy 33,001-60,000	HHDT	0.0480	0.1499	0.0483
Line Haul > 60,000 lbs	LHV	0.0480	0.1499	0.0483
Urban Bus	UB	0.0480	0.1499	0.0483
Motorcycle	MCY	0.0073	0.0073	0.0073
School Bus	SBUS	0.0480	0.1499	0.0483
Motor Home	MH	0.0480	0.1499	0.0483

Running Emissions (pounds per day)

Vehicle Type	Non-Catalyst	Catalyst	Diesel
Light Auto	0.00	0.12	0.00
Light Truck < 3,750 lbs	0.00	0.04	0.00
Light Truck 3,751- 5,750	0.00	0.04	0.00
Med Truck 5,751- 8,500	0.00	0.02	0.00
Lite-Heavy 8,501-10,000	0.00	0.01	0.00
Lite-Heavy 10,001-14,000	0.00	0.00	0.00
Med-Heavy 14,001-33,000	0.00	0.00	0.00
Heavy-Heavy 33,001-60,000	0.00	0.00	0.00
Line Haul > 60,000 lbs	0.00	0.00	0.00
Urban Bus	0.00	0.00	0.00
Motorcycle	0.00	0.00	0.00
School Bus	0.00	0.00	0.00
Motor Home	0.00	0.01	0.00
Total	0.00	0.24	0.01

Total Trips 194

Starting Emission Factors (g/start)

Vehicle Type	Type	Non-Catalyst	Catalyst	Diesel
Light Auto	LDA	0.028	0.072	0.000
Light Truck < 3,750 lbs	LDT1	0.032	0.093	-0.001
Light Truck 3,751- 5,750	LDT2	0.032	0.093	-0.001
Med Truck 5,751- 8,500	MDV	0.032	0.093	-0.001
Lite-Heavy 8,501-10,000	LHDT1	0.070	0.194	-0.002
Lite-Heavy 10,001-14,000	LHDT2	0.070	0.194	-0.002
Med-Heavy 14,001-33,000	MHDT	0.070	0.194	-0.002
Heavy-Heavy 33,001-60,000	HHDT	0.070	0.194	-0.002
Line Haul > 60,000 lbs	LHV	0.070	0.194	-0.002
Urban Bus	UB	0.070	0.194	-0.002
Motorcycle	MCY	0.012	0.012	0.012
School Bus	SBUS	0.070	0.194	-0.002
Motor Home	MH	0.070	0.194	-0.002

Trip Distribution

Vehicle Type	Type	Non-Catalyst	Catalyst	Diesel
Light Auto	LDA	1.2	104.6	0.2
Light Truck < 3,750 lbs	LDT1	0.6	28.3	0.6
Light Truck 3,751- 5,750	LDT2	0.4	30.8	0.2
Med Truck 5,751- 8,500	MDV	0.2	13.6	0.4
Lite-Heavy 8,501-10,000	LHDT1	0.0	1.7	0.4
Lite-Heavy 10,001-14,000	LHDT2	0.0	0.4	0.2
Med-Heavy 14,001-33,000	MHDT	0.0	0.4	1.6
Heavy-Heavy 33,001-60,000	HHDT	0.0	0.2	1.6
Line Haul > 60,000 lbs	LHV	0.0	0.0	0.0
Urban Bus	UB	0.0	0.2	0.2
Motorcycle	MCY	2.1	1.0	0.0
School Bus	SBUS	0.0	0.0	0.2
Motor Home	MH	0.2	2.3	0.2
Total		4.7	183.5	5.7

Starting Emissions (pounds per day)

Vehicle Type	Type	Non-Catalyst	Catalyst	Diesel
Light Auto	LDA	0.0001	0.0166	0.0000
Light Truck < 3,750 lbs	LDT1	0.0000	0.0058	0.0000
Light Truck 3,751- 5,750	LDT2	0.0000	0.0063	0.0000
Med Truck 5,751- 8,500	MDV	0.0000	0.0028	0.0000
Lite-Heavy 8,501-10,000	LHDT1	0.0000	0.0007	0.0000
Lite-Heavy 10,001-14,000	LHDT2	0.0000	0.0002	0.0000
Med-Heavy 14,001-33,000	MHDT	0.0000	0.0002	0.0000
Heavy-Heavy 33,001-60,000	HHDT	0.0000	0.0001	0.0000
Line Haul > 60,000 lbs	LHV	0.0000	0.0000	0.0000
Urban Bus	UB	0.0000	0.0001	0.0000
Motorcycle	MCY	0.0001	0.0000	0.0000
School Bus	SBUS	0.0000	0.0000	0.0000
Motor Home	MH	0.0000	0.0010	0.0000
Total		0.0002	0.0337	0.0000

- Source of running emission factors: U.S. Environmental Protection Agency. Climate Leaders Greenhouse Gas Inventory Protocol, Core Module Guidance. Direct Emissions from Mobile Combustion Sources. October 2004.
 - Source of vehicle percentages: URBEMIS2002 default values.
 - Source of starting emissions: U.S. Environmental Protection Agency. Prepared by ICF Consulting. EPA420-P-04-016. Update of Methane and Nitrous Oxide Emission Factors for On-Highway Vehicles. November 2004.

Electricity - Indirect Emissions

Project: Marina Park-Existing Uses
 Prepared by: Michael Brandman Associates
 Prepared on: 9/15/2008

Land Use	Dwelling Units	Electricity Use (kWh/sf-year)*	Electricity Use (kWh/year)
Mobile Homes	57	5626.5	320710.5
			0
			0
			0
Total			320710.5

321 MWh/year

Greenhouse Gas	Emission Factor (pounds per MWh/year)	Emissions (pounds/year)	Emissions (tons/year)
Carbon dioxide	804.54	258,024	129
Methane	0.0067	2	0.001
Nitrous oxide	0.0037	1	0.001

Emission factor source: California Climate Action Registry. General Reporting Protocol. Reporting Entity-Wide Greenhouse Gas Emissions. Version 2.2, March 2007. www.climateregistry.org

Residential electricity usage rate: 5626.50 kwh/unit/year, from South Coast Air Quality Management 1993 CEQA Handbook, Table 9-11-A

* Table E-1 from California Energy Commission. California Commercial End-Use Survey. Consultant Report. March 2006. CEC-400-2006-005

Table E-1: Overview of Energy Usage in the Statewide Service Area

Building Type	Floor Stock (kft ²)	Annual Energy Intensities			Total Annual Usage	
		Electricity (kWh/ft ²)	Natural Gas (therm/ft ²)	Natural Gas (kBtu/ft ²)	Electricity (GWh)	Natural Gas (Mtherm)
All Commercial	4,920,114	13.53	0.26	35.99	67077	1278.50
Small Office (<=30k ft ²)	361,584	13.10	0.11	10.54	4736	38.18
Large Office (>=30k ft ²)	660,429	17.70	0.22	21.93	11691	144.80
Restaurant	148,892	40.20	2.10	309.98	5986	312.60
Retail	700,053	14.06	0.05	4.52	9671	32.50
Food Store	144,209	40.99	0.28	27.60	5911	39.80
Refrigerated Warehouse	55,540	20.02	0.06	5.60	1913	5.30
Unrefrigerated Warehouse	564,166	4.45	0.03	3.07	2467	17.00
School	445,106	7.46	0.16	15.97	3323	71.18
College	265,942	12.26	0.34	34.24	3224	70.50
Health	232,606	19.61	0.76	75.53	4551	175.70
Lodging	270,044	12.13	0.42	42.40	3275	114.50
Miscellaneous	1,099,544	9.84	0.33	23.34	10617	256.60
All Offices	1,022,012	16.08	0.18	17.90	15436	182.90
All Warehouses	649,706	6.74	0.03	3.44	4380	23.40

Electricity Use in Typical Urban Water Systems

Project: Marina Park-Existing Uses
 Prepared by: Michael Brandman Associates
 Prepared on: 9/15/2008

	kWh/MG	
	Northern California	Southern California
Water Supply and Conveyance	150	8,900
Water Treatment	100	100
Water Distribution	1,200	1,200
Wastewater Treatment	2,500	2,500
Totals	3,950	12,700

From California's Water Energy Relationship, CEC 2005

	Gallons per day	Millions Gallons (MG) per year	kWh	MWh
	Water Usage	12000		
Energy Usage			55,626	56

Greenhouse Gas	Indirect Electricity Emission Factor		
	(pounds per MWh/year)	Emissions (pounds/year)	Emissions (tons/year)
Carbon dioxide	804.54	44,753	22
Methane	0.0067	0.37	0.000
Nitrous oxide	0.0037	0.21	0.000

Emission factor for electricity source:
 California Climate Action Registry. General Reporting Protocol. Reporting Entity-Wide Greenhouse Gas Emissions. Version 2.2, March 2007. www.climateregistry.org

CEC 2005: California Energy Commission. California's Energy-Water Relationship. Final Staff Report. November 2005. CEC-700-2005-011-SF

Natural Gas Combustion

Marina Park-Existing Uses

Prepared by Michael Brandman Associates

9/15/2008

Gas	Type of Land Use	Square Feet or Units	Natural Gas Usage Factor* (SCF/square foot or unit/month)	Natural Gas Usage for Project (SCF/month)	Natural Gas usage for Project (SCF/year)	Emission Factor (g CO2/SCF)**	Emission Factor (g/MMBTU)**	Heating Value of Natural Gas (BTU/SCF)**	Emissions (tons per year)	Emissions (pounds per day)
Methane	Office	0	2.0	0	0	N/A	4.75	1020	0.00	0.00
	Retail/Shopping	0	2.9	0	0	N/A	4.75	1020	0.00	0.00
	Residential	57	6665	379905	4558860	N/A	4.75	1020	0.02	0.13
	Industrial		241611	0	0	N/A	4.75	1020	0.00	0.00
	Multi-family	0	4011.5	0	0	N/A	4.75	1020	0.00	0.00
Nitrous Oxide	Office	0	2.0	0	0	N/A	0.095	1020	0.00	0.00
	Retail/Shopping	0	2.9	0	0	N/A	0.095	1020	0.00	0.00
	Residential	57	6665	379905	4558860	N/A	0.095	1020	0.00	0.00
	Industrial		241611	0	0	N/A	0.095	1020	0.00	0.00
	Multi-family	0	4011.5	0	0	N/A	0.095	1020	0.00	0.00

Total

Units	Nitrous Oxide	Methane
pounds per day	0.00	0.13
tons per year	0.00	0.02
Global warming potential	310	21
MTCO2e/year	0.000000	0.000001

* Natural gas usage factor from URBEMIS2002 default; Industrial is based on number of buildings

** USEPA, 2004: Direct Emissions from Stationary Combustion Sources, Climate Leaders Greenhouse Inventory Protocol, Core Model Guidance, October 2004
Emissions of CH4, N2O = Emission Factor x Heating Value of Natural Gas x Natural Gas Usage x Number of Units/Square Feet

Air Conditioning and Refrigeration Fugitive Emissions

Project: Marina Park-Existing Uses
 Prepared by: Michael Brandman Associates
 Prepared on: 9/15/2008

Type of Unit	Units	Capacity of Unit (kg)	Annual Leak Rate in percent of capacity	Emissions (kg/year)	Emissions (tons/year)	Global Warming Potential	Metric Tons CO2 Equiv./year
Domestic Refrigeration	57	0.5	0.5%	0.1425	0.000	1300	0
Commercial Refrigeration		1000	35.0%	0	0.000	1300	0
Residential A/C	57	50	10%	285	0.3135	1300	370
Office A/C		100	10%	0	0	1300	0
Commercial A/C		100	10%	0.0	0.000	1300	0
Industrial A/C		100	10%	0	0	1300	0
Total					0.314		370

Source:
 U.S. Environmental Protection Agency, Climate Leaders. May 2008. Direct HFC and PFC Emissions from Use of Refrigeration and Air Conditioning Equipment. EPA430-K-03-004. <http://www.epa.gov/stateply/documents/resources/mfgrfg.pdf>, Accessed in July 2008.