

APPENDIX D

AIR QUALITY IMPACT ANALYSIS

3/18/2009 6:04:43 PM

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 (tons/year, unmitigated)	0.06	0.04	0.58	0.00	0.00	0.00	31.59

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 (tons/year, unmitigated)	1.11	1.71	14.11	0.02	3.10	0.60	1,779.75

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 (tons/year, unmitigated)	1.17	1.75	14.69	0.02	3.10	0.60	1,811.34

Construction Unmitigated Detail Report:

CONSTRUCTION EMISSION ESTIMATES Annual Tons Per Year, 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>
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Phase Assumptions

Phase: Demolition 10/3/2011 - 10/25/2011 - Default Demolition Description

Building Volume Total (cubic feet): 60350

Building Volume Daily (cubic feet): 9500

On Road Truck Travel (VMT): 131.94

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 1 hours per day

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

Phase: Fine Grading 10/26/2011 - 3/16/2012 - Default Mass Site Grading/Excavation Description

Total Acres Disturbed: 7

Maximum Daily Acreage Disturbed: 1.75

Fugitive Dust Level of Detail: Default

20 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 4 hours per day

Phase: Paving 3/19/2012 - 4/4/2012 - Default Fine Site Grading/Excavation Description

Acres to be Paved: 0.75

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 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

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Phase: Building Construction 3/19/2012 - 3/13/2013 - Default Trenching Description

Off-Road Equipment:

- 1 Cranes (399 hp) operating at a 0.43 load factor for 3 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 Graders (174 hp) operating at a 0.61 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
- 2 Welders (45 hp) operating at a 0.45 load factor for 8 hours per day

Phase: Architectural Coating 2/6/2013 - 3/7/2013 - Default Paving 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 Annual Tons Per Year, Mitigated

<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>
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Construction Related Mitigation Measures

The following mitigation measures apply to Phase: Fine Grading 10/26/2011 - 3/16/2012 - Default Mass Site Grading/Excavation Description

For Soil Stabilizing Measures, the Apply soil stabilizers to inactive areas mitigation reduces emissions by:

PM10: 84% PM25: 84%

For Soil Stabilizing Measures, the Replace ground cover in disturbed areas quickly mitigation reduces emissions by:

PM10: 5% PM25: 5%

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%

Area Source Unmitigated Detail Report:

AREA SOURCE EMISSION ESTIMATES Annual Tons Per Year, 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	0.00	0.03	0.02	0.00	0.00	0.00	30.56
Hearth							
Landscape	0.04	0.01	0.56	0.00	0.00	0.00	1.03
Consumer Products	0.00						
Architectural Coatings	0.02						
TOTALS (tons/year, unmitigated)	0.06	0.04	0.58	0.00	0.00	0.00	31.59

Area Source Changes to Defaults

Operational Unmitigated Detail Report:

OPERATIONAL EMISSION ESTIMATES Annual Tons Per Year, Unmitigated

Source	ROG	NOX	CO	SO2	PM10	PM25	CO2
Main Building	0.97	1.49	12.29	0.02	2.70	0.52	1,550.16
Other buildings	0.14	0.22	1.82	0.00	0.40	0.08	229.59
TOTALS (tons/year, unmitigated)	1.11	1.71	14.11	0.02	3.10	0.60	1,779.75

Operational Settings:

Does not include correction for passby trips

Does not include double counting adjustment for internal trips

Analysis Year: 2013 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
Main Building		52.37	1000 sq ft	18.23	954.71	8,566.57
Other buildings		52.37	1000 sq ft	2.70	141.40	1,268.77
					1,096.11	9,835.34

Vehicle Fleet Mix

Vehicle Type	Percent Type	Non-Catalyst	Catalyst	Diesel
Light Auto	53.3	0.4	99.4	0.2
Light Truck < 3750 lbs	6.8	1.5	97.0	1.5
Light Truck 3751-5750 lbs	23.0	0.4	99.6	0.0
Med Truck 5751-8500 lbs	10.1	1.0	99.0	0.0

Vehicle Fleet Mix

Vehicle Type	Percent Type	Non-Catalyst	Catalyst	Diesel
Lite-Heavy Truck 8501-10,000 lbs	1.5	0.0	86.7	13.3
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	2.3	56.5	43.5	0.0
School Bus	0.1	0.0	0.0	100.0
Motor Home	0.8	0.0	87.5	12.5

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)						
Main Building				2.0	1.0	97.0
Other buildings				2.0	1.0	97.0

Operational Changes to Defaults

Urbemis 2007 Version 9.2.4

Combined Annual Emissions Reports (Tons/Year)

File Name: C:\Work\Projects\Discovery Center\2006 Mobile Source.urb924

Project Name: Discovery Center Existing Mobile

Project Location: Los Angeles County

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

Off-Road Vehicle Emissions Based on: OFFROAD2007

Summary Report:

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 (tons/year, unmitigated)	0.75	1.07	8.99	0.01	1.07	0.21	615.58

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 (tons/year, unmitigated)	0.75	1.07	8.99	0.01	1.07	0.21	615.58

Operational Unmitigated Detail Report:

OPERATIONAL EMISSION ESTIMATES Annual Tons Per Year, Unmitigated

<u>Source</u>	ROG	NOX	CO	SO2	PM10	PM25	CO2
Nature Center	0.75	1.07	8.99	0.01	1.07	0.21	615.58
TOTALS (tons/year, unmitigated)	0.75	1.07	8.99	0.01	1.07	0.21	615.58

Operational Settings:

Does not include correction for passby trips

Does not include double counting adjustment for internal trips

Analysis Year: 2006 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
Nature Center		378.00	1000 sq ft	1.00	378.00	3,391.79
					378.00	3,391.79

Vehicle Fleet Mix

Vehicle Type	Percent Type	Non-Catalyst	Catalyst	Diesel
Light Auto	54.0	2.4	97.2	0.4
Light Truck < 3750 lbs	6.9	5.8	91.3	2.9
Light Truck 3751-5750 lbs	22.5	1.3	98.7	0.0
Med Truck 5751-8500 lbs	9.9	2.0	98.0	0.0
Lite-Heavy Truck 8501-10,000 lbs	1.5	0.0	86.7	13.3
Lite-Heavy Truck 10,001-14,000 lbs	0.5	0.0	60.0	40.0

Vehicle Fleet Mix

Vehicle Type	Percent Type	Non-Catalyst	Catalyst	Diesel
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	100.0	0.0
Urban Bus	0.1	0.0	0.0	100.0
Motorcycle	2.3	82.6	17.4	0.0
School Bus	0.1	0.0	0.0	100.0
Motor Home	0.7	14.3	71.4	14.3

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)						
Nature Center				2.0	1.0	97.0

Urbemis 2007 Version 9.2.4

Combined Annual Emissions Reports (Tons/Year)

File Name: C:\Work\Projects\Discovery Center\2013 Mobile Source.urb924

Project Name: Discovery Center 2013 Mobile

Project Location: Los Angeles County

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

Off-Road Vehicle Emissions Based on: OFFROAD2007

Summary Report:

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 (tons/year, unmitigated)	1.48	2.31	18.98	0.02	4.17	0.81	2,393.34

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 (tons/year, unmitigated)	1.48	2.31	18.98	0.02	4.17	0.81	2,393.34

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Operational Unmitigated Detail Report:

OPERATIONAL EMISSION ESTIMATES Annual Tons Per Year, Unmitigated

<u>Source</u>	ROG	NOX	CO	SO2	PM10	PM25	CO2
Nature Center	1.48	2.31	18.98	0.02	4.17	0.81	2,393.34
TOTALS (tons/year, unmitigated)	1.48	2.31	18.98	0.02	4.17	0.81	2,393.34

Operational Settings:

Does not include correction for passby trips

Does not include double counting adjustment for internal trips

Analysis Year: 2013 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
Nature Center		1,474.00	1000 sq ft	1.00	1,474.00	13,226.20
					1,474.00	13,226.20

Vehicle Fleet Mix

Vehicle Type	Percent Type	Non-Catalyst	Catalyst	Diesel
Light Auto	53.3	0.4	99.4	0.2
Light Truck < 3750 lbs	6.8	1.5	97.0	1.5
Light Truck 3751-5750 lbs	23.0	0.4	99.6	0.0
Med Truck 5751-8500 lbs	10.1	1.0	99.0	0.0
Lite-Heavy Truck 8501-10,000 lbs	1.5	0.0	86.7	13.3
Lite-Heavy Truck 10,001-14,000 lbs	0.5	0.0	60.0	40.0

Vehicle Fleet Mix

Vehicle Type	Percent Type	Non-Catalyst	Catalyst	Diesel
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	2.3	56.5	43.5	0.0
School Bus	0.1	0.0	0.0	100.0
Motor Home	0.8	0.0	87.5	12.5

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)						
Nature Center				2.0	1.0	97.0

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Urbemis 2007 Version 9.2.4

Combined Summer Emissions Reports (Pounds/Day)

File Name: C:\Documents and Settings\kuhny\Desktop\Disc Center\DiscoveryCenterMar09.urb924

Project Name: San Gabriel River Discovery Center 092807

Project Location: Los Angeles County

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>
2011 TOTALS (lbs/day unmitigated)	2.61	21.10	12.31	0.01	35.01	1.09	36.10	7.31	1.00	8.32	2,101.69
2011 TOTALS (lbs/day mitigated)	2.61	21.10	12.31	0.01	7.94	1.09	9.03	1.66	1.00	2.66	2,101.69
2012 TOTALS (lbs/day unmitigated)	5.36	29.30	22.64	0.01	35.01	2.16	36.01	7.31	1.99	8.23	3,395.40
2012 TOTALS (lbs/day mitigated)	5.36	29.30	22.64	0.01	7.94	2.16	8.94	1.66	1.99	2.58	3,395.40
2013 TOTALS (lbs/day unmitigated)	23.50	16.93	13.82	0.00	0.01	1.12	1.13	0.00	1.03	1.03	2,140.42
2013 TOTALS (lbs/day mitigated)	23.50	16.93	13.82	0.00	0.01	1.12	1.13	0.00	1.03	1.03	2,140.42

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)	0.38	0.18	3.21	0.00	0.01	0.01	173.06

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)	5.88	8.79	78.51	0.10	16.98	3.30	10,072.83

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)	6.26	8.97	81.72	0.10	16.99	3.31	10,245.89

Construction Unmitigated Detail Report:

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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 10/3/2011-10/25/2011 Active Days: 17	1.40	11.06	7.12	0.01	4.01	0.71	4.72	0.84	0.65	1.49	1,383.85
Demolition 10/03/2011-10/25/2011	1.40	11.06	7.12	0.01	4.01	0.71	4.72	0.84	0.65	1.49	1,383.85
Fugitive Dust	0.00	0.00	0.00	0.00	3.99	0.00	3.99	0.83	0.00	0.83	0.00
Demo Off Road Diesel	1.05	7.22	4.58	0.00	0.00	0.55	0.55	0.00	0.50	0.50	700.30
Demo On Road Diesel	0.31	3.78	1.53	0.01	0.02	0.16	0.18	0.01	0.14	0.15	559.23
Demo Worker Trips	0.03	0.06	1.01	0.00	0.01	0.00	0.01	0.00	0.00	0.00	124.32
Time Slice 10/26/2011-12/30/2011 Active Days: 48	<u>2.61</u>	<u>21.10</u>	<u>12.31</u>	0.00	35.01	<u>1.09</u>	36.10	7.31	<u>1.00</u>	8.32	<u>2,101.69</u>
Fine Grading 10/26/2011-03/16/2012	2.61	21.10	12.31	0.00	35.01	1.09	36.10	7.31	1.00	8.32	2,101.69
Fine Grading Dust	0.00	0.00	0.00	0.00	35.00	0.00	35.00	7.31	0.00	7.31	0.00
Fine Grading Off Road Diesel	2.58	21.04	11.29	0.00	0.00	1.09	1.09	0.00	1.00	1.00	1,977.37
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	0.03	0.06	1.01	0.00	0.01	0.00	0.01	0.00	0.00	0.00	124.32
Time Slice 1/2/2012-3/16/2012 Active Days: 55	2.48	19.81	11.82	0.00	35.01	1.00	36.01	7.31	0.92	8.23	2,101.67
Fine Grading 10/26/2011-03/16/2012	2.48	19.81	11.82	0.00	35.01	1.00	36.01	7.31	0.92	8.23	2,101.67
Fine Grading Dust	0.00	0.00	0.00	0.00	35.00	0.00	35.00	7.31	0.00	7.31	0.00
Fine Grading Off Road Diesel	2.45	19.76	10.87	0.00	0.00	1.00	1.00	0.00	0.92	0.92	1,977.37
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	0.03	0.05	0.95	0.00	0.01	0.00	0.01	0.00	0.00	0.00	124.29

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Time Slice 3/19/2012-4/4/2012 Active Days: 13	<u>5.36</u>	<u>29.30</u>	<u>22.64</u>	<u>0.01</u>	0.02	<u>2.16</u>	2.19	0.01	<u>1.99</u>	2.00	<u>3,395.40</u>
Asphalt 03/19/2012-04/04/2012	1.96	11.26	8.71	0.00	0.01	0.94	0.95	0.00	0.86	0.87	1,284.52
Paving Off-Gas	0.15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Paving Off Road Diesel	1.72	10.64	6.84	0.00	0.00	0.91	0.91	0.00	0.84	0.84	979.23
Paving On Road Diesel	0.04	0.53	0.21	0.00	0.00	0.02	0.02	0.00	0.02	0.02	87.78
Paving Worker Trips	0.05	0.10	1.65	0.00	0.01	0.01	0.02	0.00	0.00	0.01	217.52
Building 03/19/2012-03/13/2013	3.40	18.04	13.93	0.00	0.01	1.22	1.23	0.00	1.13	1.13	2,110.88
Building Off Road Diesel	3.34	17.78	12.50	0.00	0.00	1.21	1.21	0.00	1.12	1.12	1,901.51
Building Vendor Trips	0.02	0.19	0.17	0.00	0.00	0.01	0.01	0.00	0.01	0.01	42.88
Building Worker Trips	0.04	0.07	1.27	0.00	0.01	0.00	0.01	0.00	0.00	0.01	166.50
Time Slice 4/5/2012-12/31/2012 Active Days: 193	3.40	18.04	13.93	0.00	0.01	1.22	1.23	0.00	1.13	1.13	2,110.88
Building 03/19/2012-03/13/2013	3.40	18.04	13.93	0.00	0.01	1.22	1.23	0.00	1.13	1.13	2,110.88
Building Off Road Diesel	3.34	17.78	12.50	0.00	0.00	1.21	1.21	0.00	1.12	1.12	1,901.51
Building Vendor Trips	0.02	0.19	0.17	0.00	0.00	0.01	0.01	0.00	0.01	0.01	42.88
Building Worker Trips	0.04	0.07	1.27	0.00	0.01	0.00	0.01	0.00	0.00	0.01	166.50
Time Slice 1/1/2013-2/5/2013 Active Days: 26	3.12	16.92	13.61	0.00	0.01	1.12	1.13	0.00	1.03	1.03	2,110.86
Building 03/19/2012-03/13/2013	3.12	16.92	13.61	0.00	0.01	1.12	1.13	0.00	1.03	1.03	2,110.86
Building Off Road Diesel	3.07	16.68	12.28	0.00	0.00	1.11	1.11	0.00	1.02	1.02	1,901.51
Building Vendor Trips	0.02	0.17	0.15	0.00	0.00	0.01	0.01	0.00	0.01	0.01	42.88
Building Worker Trips	0.04	0.07	1.18	0.00	0.01	0.00	0.01	0.00	0.00	0.01	166.47

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Time Slice 2/6/2013-3/7/2013 Active Days: 22	<u>23.50</u>	<u>16.93</u>	<u>13.82</u>	<u>0.00</u>	<u>0.01</u>	<u>1.12</u>	<u>1.13</u>	<u>0.00</u>	<u>1.03</u>	<u>1.03</u>	<u>2,140.42</u>
Building 03/19/2012-03/13/2013	3.12	16.92	13.61	0.00	0.01	1.12	1.13	0.00	1.03	1.03	2,110.86
Building Off Road Diesel	3.07	16.68	12.28	0.00	0.00	1.11	1.11	0.00	1.02	1.02	1,901.51
Building Vendor Trips	0.02	0.17	0.15	0.00	0.00	0.01	0.01	0.00	0.01	0.01	42.88
Building Worker Trips	0.04	0.07	1.18	0.00	0.01	0.00	0.01	0.00	0.00	0.01	166.47
Coating 02/06/2013-03/07/2013	20.39	0.01	0.21	0.00	0.00	0.00	0.00	0.00	0.00	0.00	29.56
Architectural Coating	20.38	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Coating Worker Trips	0.01	0.01	0.21	0.00	0.00	0.00	0.00	0.00	0.00	0.00	29.56
Time Slice 3/8/2013-3/13/2013 Active Days: 4	3.12	16.92	13.61	0.00	0.01	1.12	1.13	0.00	1.03	1.03	2,110.86
Building 03/19/2012-03/13/2013	3.12	16.92	13.61	0.00	0.01	1.12	1.13	0.00	1.03	1.03	2,110.86
Building Off Road Diesel	3.07	16.68	12.28	0.00	0.00	1.11	1.11	0.00	1.02	1.02	1,901.51
Building Vendor Trips	0.02	0.17	0.15	0.00	0.00	0.01	0.01	0.00	0.01	0.01	42.88
Building Worker Trips	0.04	0.07	1.18	0.00	0.01	0.00	0.01	0.00	0.00	0.01	166.47

Phase Assumptions

Phase: Demolition 10/3/2011 - 10/25/2011 - Default Demolition Description

Building Volume Total (cubic feet): 60350

Building Volume Daily (cubic feet): 9500

On Road Truck Travel (VMT): 131.94

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 1 hours per day

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

Phase: Fine Grading 10/26/2011 - 3/16/2012 - Default Mass Site Grading/Excavation Description

Total Acres Disturbed: 7

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Maximum Daily Acreage Disturbed: 1.75

Fugitive Dust Level of Detail: Default

20 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 4 hours per day

Phase: Paving 3/19/2012 - 4/4/2012 - Default Fine Site Grading/Excavation Description

Acres to be Paved: 0.75

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 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 3/19/2012 - 3/13/2013 - Default Trenching Description

Off-Road Equipment:

1 Cranes (399 hp) operating at a 0.43 load factor for 3 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 Graders (174 hp) operating at a 0.61 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

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

Phase: Architectural Coating 2/6/2013 - 3/7/2013 - Default Paving 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

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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

	<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 10/3/2011-10/25/2011 Active Days: 17	1.40	11.06	7.12	<u>0.01</u>	4.01	0.71	4.72	0.84	0.65	1.49	1,383.85
Demolition 10/03/2011-10/25/2011	1.40	11.06	7.12	0.01	4.01	0.71	4.72	0.84	0.65	1.49	1,383.85
Fugitive Dust	0.00	0.00	0.00	0.00	3.99	0.00	3.99	0.83	0.00	0.83	0.00
Demo Off Road Diesel	1.05	7.22	4.58	0.00	0.00	0.55	0.55	0.00	0.50	0.50	700.30
Demo On Road Diesel	0.31	3.78	1.53	0.01	0.02	0.16	0.18	0.01	0.14	0.15	559.23
Demo Worker Trips	0.03	0.06	1.01	0.00	0.01	0.00	0.01	0.00	0.00	0.00	124.32
Time Slice 10/26/2011-12/30/2011 Active Days: 48	<u>2.61</u>	<u>21.10</u>	<u>12.31</u>	0.00	<u>7.94</u>	<u>1.09</u>	<u>9.03</u>	<u>1.66</u>	<u>1.00</u>	<u>2.66</u>	<u>2,101.69</u>
Fine Grading 10/26/2011-03/16/2012	2.61	21.10	12.31	0.00	7.94	1.09	9.03	1.66	1.00	2.66	2,101.69
Fine Grading Dust	0.00	0.00	0.00	0.00	7.94	0.00	7.94	1.66	0.00	1.66	0.00
Fine Grading Off Road Diesel	2.58	21.04	11.29	0.00	0.00	1.09	1.09	0.00	1.00	1.00	1,977.37
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	0.03	0.06	1.01	0.00	0.01	0.00	0.01	0.00	0.00	0.00	124.32

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Time Slice 1/2/2012-3/16/2012 Active Days: 55	2.48	19.81	11.82	0.00	<u>7.94</u>	1.00	<u>8.94</u>	<u>1.66</u>	0.92	<u>2.58</u>	2,101.67
Fine Grading 10/26/2011-03/16/2012	2.48	19.81	11.82	0.00	7.94	1.00	8.94	1.66	0.92	2.58	2,101.67
Fine Grading Dust	0.00	0.00	0.00	0.00	7.94	0.00	7.94	1.66	0.00	1.66	0.00
Fine Grading Off Road Diesel	2.45	19.76	10.87	0.00	0.00	1.00	1.00	0.00	0.92	0.92	1,977.37
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	0.03	0.05	0.95	0.00	0.01	0.00	0.01	0.00	0.00	0.00	124.29
Time Slice 3/19/2012-4/4/2012 Active Days: 13	<u>5.36</u>	<u>29.30</u>	<u>22.64</u>	<u>0.01</u>	0.02	<u>2.16</u>	2.19	0.01	<u>1.99</u>	2.00	<u>3,395.40</u>
Asphalt 03/19/2012-04/04/2012	1.96	11.26	8.71	0.00	0.01	0.94	0.95	0.00	0.86	0.87	1,284.52
Paving Off-Gas	0.15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Paving Off Road Diesel	1.72	10.64	6.84	0.00	0.00	0.91	0.91	0.00	0.84	0.84	979.23
Paving On Road Diesel	0.04	0.53	0.21	0.00	0.00	0.02	0.02	0.00	0.02	0.02	87.78
Paving Worker Trips	0.05	0.10	1.65	0.00	0.01	0.01	0.02	0.00	0.00	0.01	217.52
Building 03/19/2012-03/13/2013	3.40	18.04	13.93	0.00	0.01	1.22	1.23	0.00	1.13	1.13	2,110.88
Building Off Road Diesel	3.34	17.78	12.50	0.00	0.00	1.21	1.21	0.00	1.12	1.12	1,901.51
Building Vendor Trips	0.02	0.19	0.17	0.00	0.00	0.01	0.01	0.00	0.01	0.01	42.88
Building Worker Trips	0.04	0.07	1.27	0.00	0.01	0.00	0.01	0.00	0.00	0.01	166.50
Time Slice 4/5/2012-12/31/2012 Active Days: 193	3.40	18.04	13.93	0.00	0.01	1.22	1.23	0.00	1.13	1.13	2,110.88
Building 03/19/2012-03/13/2013	3.40	18.04	13.93	0.00	0.01	1.22	1.23	0.00	1.13	1.13	2,110.88
Building Off Road Diesel	3.34	17.78	12.50	0.00	0.00	1.21	1.21	0.00	1.12	1.12	1,901.51
Building Vendor Trips	0.02	0.19	0.17	0.00	0.00	0.01	0.01	0.00	0.01	0.01	42.88
Building Worker Trips	0.04	0.07	1.27	0.00	0.01	0.00	0.01	0.00	0.00	0.01	166.50

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Time Slice 1/1/2013-2/5/2013 Active Days: 26	3.12	16.92	13.61	0.00	0.01	1.12	1.13	0.00	1.03	1.03	2,110.86
Building 03/19/2012-03/13/2013	3.12	16.92	13.61	0.00	0.01	1.12	1.13	0.00	1.03	1.03	2,110.86
Building Off Road Diesel	3.07	16.68	12.28	0.00	0.00	1.11	1.11	0.00	1.02	1.02	1,901.51
Building Vendor Trips	0.02	0.17	0.15	0.00	0.00	0.01	0.01	0.00	0.01	0.01	42.88
Building Worker Trips	0.04	0.07	1.18	0.00	0.01	0.00	0.01	0.00	0.00	0.01	166.47
Time Slice 2/6/2013-3/7/2013 Active Days: 22	<u>23.50</u>	<u>16.93</u>	<u>13.82</u>	<u>0.00</u>	<u>0.01</u>	<u>1.12</u>	<u>1.13</u>	<u>0.00</u>	<u>1.03</u>	<u>1.03</u>	<u>2,140.42</u>
Building 03/19/2012-03/13/2013	3.12	16.92	13.61	0.00	0.01	1.12	1.13	0.00	1.03	1.03	2,110.86
Building Off Road Diesel	3.07	16.68	12.28	0.00	0.00	1.11	1.11	0.00	1.02	1.02	1,901.51
Building Vendor Trips	0.02	0.17	0.15	0.00	0.00	0.01	0.01	0.00	0.01	0.01	42.88
Building Worker Trips	0.04	0.07	1.18	0.00	0.01	0.00	0.01	0.00	0.00	0.01	166.47
Coating 02/06/2013-03/07/2013	20.39	0.01	0.21	0.00	0.00	0.00	0.00	0.00	0.00	0.00	29.56
Architectural Coating	20.38	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Coating Worker Trips	0.01	0.01	0.21	0.00	0.00	0.00	0.00	0.00	0.00	0.00	29.56
Time Slice 3/8/2013-3/13/2013 Active Days: 4	3.12	16.92	13.61	0.00	0.01	1.12	1.13	0.00	1.03	1.03	2,110.86
Building 03/19/2012-03/13/2013	3.12	16.92	13.61	0.00	0.01	1.12	1.13	0.00	1.03	1.03	2,110.86
Building Off Road Diesel	3.07	16.68	12.28	0.00	0.00	1.11	1.11	0.00	1.02	1.02	1,901.51
Building Vendor Trips	0.02	0.17	0.15	0.00	0.00	0.01	0.01	0.00	0.01	0.01	42.88
Building Worker Trips	0.04	0.07	1.18	0.00	0.01	0.00	0.01	0.00	0.00	0.01	166.47

Construction Related Mitigation Measures

The following mitigation measures apply to Phase: Fine Grading 10/26/2011 - 3/16/2012 - Default Mass Site Grading/Excavation Description

For Soil Stabilizing Measures, the Apply soil stabilizers to inactive areas mitigation reduces emissions by:

PM10: 84% PM25: 84%

For Soil Stabilizing Measures, the Replace ground cover in disturbed areas quickly mitigation reduces emissions by:

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PM10: 5% PM25: 5%

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%

Area Source Unmitigated Detail Report:

AREA SOURCE EMISSION ESTIMATES Summer Pounds Per Day, Unmitigated

Source	ROG	NOx	CO	SO2	PM10	PM2.5	CO2
Natural Gas	0.01	0.14	0.12	0.00	0.00	0.00	167.44
Hearth							
Landscape	0.25	0.04	3.09	0.00	0.01	0.01	5.62
Consumer Products	0.00						
Architectural Coatings	0.12						
TOTALS (lbs/day, unmitigated)	0.38	0.18	3.21	0.00	0.01	0.01	173.06

Area Source Changes to Defaults

Operational Unmitigated Detail Report:

OPERATIONAL EMISSION ESTIMATES Summer Pounds Per Day, Unmitigated

Source	ROG	NOX	CO	SO2	PM10	PM25	CO2
Main Building	5.12	7.66	68.38	0.09	14.79	2.87	8,773.42
Other buildings	0.76	1.13	10.13	0.01	2.19	0.43	1,299.41
TOTALS (lbs/day, unmitigated)	5.88	8.79	78.51	0.10	16.98	3.30	10,072.83

Operational Settings:

Does not include correction for passby trips

Does not include double counting adjustment for internal trips

Analysis Year: 2013 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
Main Building		52.37	1000 sq ft	18.23	954.71	8,566.57
Other buildings		52.37	1000 sq ft	2.70	141.40	1,268.77
					1,096.11	9,835.34

Vehicle Fleet Mix

Vehicle Type	Percent Type	Non-Catalyst	Catalyst	Diesel
Light Auto	53.3	0.4	99.4	0.2
Light Truck < 3750 lbs	6.8	1.5	97.0	1.5
Light Truck 3751-5750 lbs	23.0	0.4	99.6	0.0
Med Truck 5751-8500 lbs	10.1	1.0	99.0	0.0
Lite-Heavy Truck 8501-10,000 lbs	1.5	0.0	86.7	13.3
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	2.3	56.5	43.5	0.0

Vehicle Fleet Mix

Vehicle Type	Percent Type	Non-Catalyst	Catalyst	Diesel
School Bus	0.1	0.0	0.0	100.0
Motor Home	0.8	0.0	87.5	12.5

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)

Main Building	2.0	1.0	97.0
Other buildings	2.0	1.0	97.0

Operational Changes to Defaults

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Urbemis 2007 Version 9.2.4

Combined Winter Emissions Reports (Pounds/Day)

File Name: C:\Documents and Settings\kuhny\Desktop\Disc Center\DiscoveryCenterMar09.urb924

Project Name: San Gabriel River Discovery Center 092807

Project Location: Los Angeles County

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>
2011 TOTALS (lbs/day unmitigated)	2.61	21.10	12.31	0.01	35.01	1.09	36.10	7.31	1.00	8.32	2,101.69
2011 TOTALS (lbs/day mitigated)	2.61	21.10	12.31	0.01	7.94	1.09	9.03	1.66	1.00	2.66	2,101.69
2012 TOTALS (lbs/day unmitigated)	5.36	29.30	22.64	0.01	35.01	2.16	36.01	7.31	1.99	8.23	3,395.40
2012 TOTALS (lbs/day mitigated)	5.36	29.30	22.64	0.01	7.94	2.16	8.94	1.66	1.99	2.58	3,395.40
2013 TOTALS (lbs/day unmitigated)	23.50	16.93	13.82	0.00	0.01	1.12	1.13	0.00	1.03	1.03	2,140.42
2013 TOTALS (lbs/day mitigated)	23.50	16.93	13.82	0.00	0.01	1.12	1.13	0.00	1.03	1.03	2,140.42

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)	0.13	0.14	0.12	0.00	0.00	0.00	167.44

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)	6.65	10.60	74.95	0.08	16.98	3.30	9,110.50

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)	6.78	10.74	75.07	0.08	16.98	3.30	9,277.94

Construction Unmitigated Detail Report:

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CONSTRUCTION EMISSION ESTIMATES Winter 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 10/3/2011-10/25/2011 Active Days: 17	1.40	11.06	7.12	0.01	4.01	0.71	4.72	0.84	0.65	1.49	1,383.85
Demolition 10/03/2011-10/25/2011	1.40	11.06	7.12	0.01	4.01	0.71	4.72	0.84	0.65	1.49	1,383.85
Fugitive Dust	0.00	0.00	0.00	0.00	3.99	0.00	3.99	0.83	0.00	0.83	0.00
Demo Off Road Diesel	1.05	7.22	4.58	0.00	0.00	0.55	0.55	0.00	0.50	0.50	700.30
Demo On Road Diesel	0.31	3.78	1.53	0.01	0.02	0.16	0.18	0.01	0.14	0.15	559.23
Demo Worker Trips	0.03	0.06	1.01	0.00	0.01	0.00	0.01	0.00	0.00	0.00	124.32
Time Slice 10/26/2011-12/30/2011 Active Days: 48	<u>2.61</u>	<u>21.10</u>	<u>12.31</u>	0.00	35.01	<u>1.09</u>	36.10	7.31	<u>1.00</u>	8.32	<u>2,101.69</u>
Fine Grading 10/26/2011-03/16/2012	2.61	21.10	12.31	0.00	35.01	1.09	36.10	7.31	1.00	8.32	2,101.69
Fine Grading Dust	0.00	0.00	0.00	0.00	35.00	0.00	35.00	7.31	0.00	7.31	0.00
Fine Grading Off Road Diesel	2.58	21.04	11.29	0.00	0.00	1.09	1.09	0.00	1.00	1.00	1,977.37
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	0.03	0.06	1.01	0.00	0.01	0.00	0.01	0.00	0.00	0.00	124.32
Time Slice 1/2/2012-3/16/2012 Active Days: 55	2.48	19.81	11.82	0.00	35.01	1.00	36.01	7.31	0.92	8.23	2,101.67
Fine Grading 10/26/2011-03/16/2012	2.48	19.81	11.82	0.00	35.01	1.00	36.01	7.31	0.92	8.23	2,101.67
Fine Grading Dust	0.00	0.00	0.00	0.00	35.00	0.00	35.00	7.31	0.00	7.31	0.00
Fine Grading Off Road Diesel	2.45	19.76	10.87	0.00	0.00	1.00	1.00	0.00	0.92	0.92	1,977.37
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	0.03	0.05	0.95	0.00	0.01	0.00	0.01	0.00	0.00	0.00	124.29

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Time Slice 3/19/2012-4/4/2012 Active Days: 13	<u>5.36</u>	<u>29.30</u>	<u>22.64</u>	<u>0.01</u>	0.02	<u>2.16</u>	2.19	0.01	<u>1.99</u>	2.00	<u>3,395.40</u>
Asphalt 03/19/2012-04/04/2012	1.96	11.26	8.71	0.00	0.01	0.94	0.95	0.00	0.86	0.87	1,284.52
Paving Off-Gas	0.15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Paving Off Road Diesel	1.72	10.64	6.84	0.00	0.00	0.91	0.91	0.00	0.84	0.84	979.23
Paving On Road Diesel	0.04	0.53	0.21	0.00	0.00	0.02	0.02	0.00	0.02	0.02	87.78
Paving Worker Trips	0.05	0.10	1.65	0.00	0.01	0.01	0.02	0.00	0.00	0.01	217.52
Building 03/19/2012-03/13/2013	3.40	18.04	13.93	0.00	0.01	1.22	1.23	0.00	1.13	1.13	2,110.88
Building Off Road Diesel	3.34	17.78	12.50	0.00	0.00	1.21	1.21	0.00	1.12	1.12	1,901.51
Building Vendor Trips	0.02	0.19	0.17	0.00	0.00	0.01	0.01	0.00	0.01	0.01	42.88
Building Worker Trips	0.04	0.07	1.27	0.00	0.01	0.00	0.01	0.00	0.00	0.01	166.50
Time Slice 4/5/2012-12/31/2012 Active Days: 193	3.40	18.04	13.93	0.00	0.01	1.22	1.23	0.00	1.13	1.13	2,110.88
Building 03/19/2012-03/13/2013	3.40	18.04	13.93	0.00	0.01	1.22	1.23	0.00	1.13	1.13	2,110.88
Building Off Road Diesel	3.34	17.78	12.50	0.00	0.00	1.21	1.21	0.00	1.12	1.12	1,901.51
Building Vendor Trips	0.02	0.19	0.17	0.00	0.00	0.01	0.01	0.00	0.01	0.01	42.88
Building Worker Trips	0.04	0.07	1.27	0.00	0.01	0.00	0.01	0.00	0.00	0.01	166.50
Time Slice 1/1/2013-2/5/2013 Active Days: 26	3.12	16.92	13.61	0.00	0.01	1.12	1.13	0.00	1.03	1.03	2,110.86
Building 03/19/2012-03/13/2013	3.12	16.92	13.61	0.00	0.01	1.12	1.13	0.00	1.03	1.03	2,110.86
Building Off Road Diesel	3.07	16.68	12.28	0.00	0.00	1.11	1.11	0.00	1.02	1.02	1,901.51
Building Vendor Trips	0.02	0.17	0.15	0.00	0.00	0.01	0.01	0.00	0.01	0.01	42.88
Building Worker Trips	0.04	0.07	1.18	0.00	0.01	0.00	0.01	0.00	0.00	0.01	166.47

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Time Slice 2/6/2013-3/7/2013 Active Days: 22	<u>23.50</u>	<u>16.93</u>	<u>13.82</u>	<u>0.00</u>	<u>0.01</u>	<u>1.12</u>	<u>1.13</u>	<u>0.00</u>	<u>1.03</u>	<u>1.03</u>	<u>2,140.42</u>
Building 03/19/2012-03/13/2013	3.12	16.92	13.61	0.00	0.01	1.12	1.13	0.00	1.03	1.03	2,110.86
Building Off Road Diesel	3.07	16.68	12.28	0.00	0.00	1.11	1.11	0.00	1.02	1.02	1,901.51
Building Vendor Trips	0.02	0.17	0.15	0.00	0.00	0.01	0.01	0.00	0.01	0.01	42.88
Building Worker Trips	0.04	0.07	1.18	0.00	0.01	0.00	0.01	0.00	0.00	0.01	166.47
Coating 02/06/2013-03/07/2013	20.39	0.01	0.21	0.00	0.00	0.00	0.00	0.00	0.00	0.00	29.56
Architectural Coating	20.38	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Coating Worker Trips	0.01	0.01	0.21	0.00	0.00	0.00	0.00	0.00	0.00	0.00	29.56
Time Slice 3/8/2013-3/13/2013 Active Days: 4	3.12	16.92	13.61	0.00	0.01	1.12	1.13	0.00	1.03	1.03	2,110.86
Building 03/19/2012-03/13/2013	3.12	16.92	13.61	0.00	0.01	1.12	1.13	0.00	1.03	1.03	2,110.86
Building Off Road Diesel	3.07	16.68	12.28	0.00	0.00	1.11	1.11	0.00	1.02	1.02	1,901.51
Building Vendor Trips	0.02	0.17	0.15	0.00	0.00	0.01	0.01	0.00	0.01	0.01	42.88
Building Worker Trips	0.04	0.07	1.18	0.00	0.01	0.00	0.01	0.00	0.00	0.01	166.47

Phase Assumptions

Phase: Demolition 10/3/2011 - 10/25/2011 - Default Demolition Description

Building Volume Total (cubic feet): 60350

Building Volume Daily (cubic feet): 9500

On Road Truck Travel (VMT): 131.94

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 1 hours per day

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

Phase: Fine Grading 10/26/2011 - 3/16/2012 - Default Mass Site Grading/Excavation Description

Total Acres Disturbed: 7

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Maximum Daily Acreage Disturbed: 1.75

Fugitive Dust Level of Detail: Default

20 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 4 hours per day

Phase: Paving 3/19/2012 - 4/4/2012 - Default Fine Site Grading/Excavation Description

Acres to be Paved: 0.75

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 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 3/19/2012 - 3/13/2013 - Default Trenching Description

Off-Road Equipment:

1 Cranes (399 hp) operating at a 0.43 load factor for 3 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 Graders (174 hp) operating at a 0.61 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

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

Phase: Architectural Coating 2/6/2013 - 3/7/2013 - Default Paving 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

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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 Winter Pounds Per Day, Mitigated

	<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 10/3/2011-10/25/2011 Active Days: 17	1.40	11.06	7.12	0.01	4.01	0.71	4.72	0.84	0.65	1.49	1,383.85
Demolition 10/03/2011-10/25/2011	1.40	11.06	7.12	0.01	4.01	0.71	4.72	0.84	0.65	1.49	1,383.85
Fugitive Dust	0.00	0.00	0.00	0.00	3.99	0.00	3.99	0.83	0.00	0.83	0.00
Demo Off Road Diesel	1.05	7.22	4.58	0.00	0.00	0.55	0.55	0.00	0.50	0.50	700.30
Demo On Road Diesel	0.31	3.78	1.53	0.01	0.02	0.16	0.18	0.01	0.14	0.15	559.23
Demo Worker Trips	0.03	0.06	1.01	0.00	0.01	0.00	0.01	0.00	0.00	0.00	124.32
Time Slice 10/26/2011-12/30/2011 Active Days: 48	<u>2.61</u>	<u>21.10</u>	<u>12.31</u>	0.00	<u>7.94</u>	<u>1.09</u>	<u>9.03</u>	<u>1.66</u>	<u>1.00</u>	<u>2.66</u>	<u>2,101.69</u>
Fine Grading 10/26/2011-03/16/2012	2.61	21.10	12.31	0.00	7.94	1.09	9.03	1.66	1.00	2.66	2,101.69
Fine Grading Dust	0.00	0.00	0.00	0.00	7.94	0.00	7.94	1.66	0.00	1.66	0.00
Fine Grading Off Road Diesel	2.58	21.04	11.29	0.00	0.00	1.09	1.09	0.00	1.00	1.00	1,977.37
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	0.03	0.06	1.01	0.00	0.01	0.00	0.01	0.00	0.00	0.00	124.32

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Time Slice 1/2/2012-3/16/2012	2.48	19.81	11.82	0.00	<u>7.94</u>	1.00	<u>8.94</u>	<u>1.66</u>	0.92	<u>2.58</u>	2,101.67
Active Days: 55											
Fine Grading 10/26/2011-03/16/2012	2.48	19.81	11.82	0.00	7.94	1.00	8.94	1.66	0.92	2.58	2,101.67
Fine Grading Dust	0.00	0.00	0.00	0.00	7.94	0.00	7.94	1.66	0.00	1.66	0.00
Fine Grading Off Road Diesel	2.45	19.76	10.87	0.00	0.00	1.00	1.00	0.00	0.92	0.92	1,977.37
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	0.03	0.05	0.95	0.00	0.01	0.00	0.01	0.00	0.00	0.00	124.29
Time Slice 3/19/2012-4/4/2012	<u>5.36</u>	<u>29.30</u>	<u>22.64</u>	<u>0.01</u>	0.02	<u>2.16</u>	2.19	0.01	<u>1.99</u>	2.00	<u>3,395.40</u>
Active Days: 13											
Asphalt 03/19/2012-04/04/2012	1.96	11.26	8.71	0.00	0.01	0.94	0.95	0.00	0.86	0.87	1,284.52
Paving Off-Gas	0.15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Paving Off Road Diesel	1.72	10.64	6.84	0.00	0.00	0.91	0.91	0.00	0.84	0.84	979.23
Paving On Road Diesel	0.04	0.53	0.21	0.00	0.00	0.02	0.02	0.00	0.02	0.02	87.78
Paving Worker Trips	0.05	0.10	1.65	0.00	0.01	0.01	0.02	0.00	0.00	0.01	217.52
Building 03/19/2012-03/13/2013	3.40	18.04	13.93	0.00	0.01	1.22	1.23	0.00	1.13	1.13	2,110.88
Building Off Road Diesel	3.34	17.78	12.50	0.00	0.00	1.21	1.21	0.00	1.12	1.12	1,901.51
Building Vendor Trips	0.02	0.19	0.17	0.00	0.00	0.01	0.01	0.00	0.01	0.01	42.88
Building Worker Trips	0.04	0.07	1.27	0.00	0.01	0.00	0.01	0.00	0.00	0.01	166.50
Time Slice 4/5/2012-12/31/2012	3.40	18.04	13.93	0.00	0.01	1.22	1.23	0.00	1.13	1.13	2,110.88
Active Days: 193											
Building 03/19/2012-03/13/2013	3.40	18.04	13.93	0.00	0.01	1.22	1.23	0.00	1.13	1.13	2,110.88
Building Off Road Diesel	3.34	17.78	12.50	0.00	0.00	1.21	1.21	0.00	1.12	1.12	1,901.51
Building Vendor Trips	0.02	0.19	0.17	0.00	0.00	0.01	0.01	0.00	0.01	0.01	42.88
Building Worker Trips	0.04	0.07	1.27	0.00	0.01	0.00	0.01	0.00	0.00	0.01	166.50

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Time Slice 1/1/2013-2/5/2013 Active Days: 26	3.12	16.92	13.61	0.00	0.01	1.12	1.13	0.00	1.03	1.03	2,110.86
Building 03/19/2012-03/13/2013	3.12	16.92	13.61	0.00	0.01	1.12	1.13	0.00	1.03	1.03	2,110.86
Building Off Road Diesel	3.07	16.68	12.28	0.00	0.00	1.11	1.11	0.00	1.02	1.02	1,901.51
Building Vendor Trips	0.02	0.17	0.15	0.00	0.00	0.01	0.01	0.00	0.01	0.01	42.88
Building Worker Trips	0.04	0.07	1.18	0.00	0.01	0.00	0.01	0.00	0.00	0.01	166.47
Time Slice 2/6/2013-3/7/2013 Active Days: 22	<u>23.50</u>	<u>16.93</u>	<u>13.82</u>	<u>0.00</u>	<u>0.01</u>	<u>1.12</u>	<u>1.13</u>	<u>0.00</u>	<u>1.03</u>	<u>1.03</u>	<u>2,140.42</u>
Building 03/19/2012-03/13/2013	3.12	16.92	13.61	0.00	0.01	1.12	1.13	0.00	1.03	1.03	2,110.86
Building Off Road Diesel	3.07	16.68	12.28	0.00	0.00	1.11	1.11	0.00	1.02	1.02	1,901.51
Building Vendor Trips	0.02	0.17	0.15	0.00	0.00	0.01	0.01	0.00	0.01	0.01	42.88
Building Worker Trips	0.04	0.07	1.18	0.00	0.01	0.00	0.01	0.00	0.00	0.01	166.47
Coating 02/06/2013-03/07/2013	20.39	0.01	0.21	0.00	0.00	0.00	0.00	0.00	0.00	0.00	29.56
Architectural Coating	20.38	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Coating Worker Trips	0.01	0.01	0.21	0.00	0.00	0.00	0.00	0.00	0.00	0.00	29.56
Time Slice 3/8/2013-3/13/2013 Active Days: 4	3.12	16.92	13.61	0.00	0.01	1.12	1.13	0.00	1.03	1.03	2,110.86
Building 03/19/2012-03/13/2013	3.12	16.92	13.61	0.00	0.01	1.12	1.13	0.00	1.03	1.03	2,110.86
Building Off Road Diesel	3.07	16.68	12.28	0.00	0.00	1.11	1.11	0.00	1.02	1.02	1,901.51
Building Vendor Trips	0.02	0.17	0.15	0.00	0.00	0.01	0.01	0.00	0.01	0.01	42.88
Building Worker Trips	0.04	0.07	1.18	0.00	0.01	0.00	0.01	0.00	0.00	0.01	166.47

Construction Related Mitigation Measures

The following mitigation measures apply to Phase: Fine Grading 10/26/2011 - 3/16/2012 - Default Mass Site Grading/Excavation Description

For Soil Stabilizing Measures, the Apply soil stabilizers to inactive areas mitigation reduces emissions by:

PM10: 84% PM25: 84%

For Soil Stabilizing Measures, the Replace ground cover in disturbed areas quickly mitigation reduces emissions by:

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PM10: 5% PM25: 5%

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%

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	0.01	0.14	0.12	0.00	0.00	0.00	167.44
Hearth							
Landscaping - No Winter Emissions							
Consumer Products	0.00						
Architectural Coatings	0.12						
TOTALS (lbs/day, unmitigated)	0.13	0.14	0.12	0.00	0.00	0.00	167.44

Area Source Changes to Defaults

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>
Main Building	5.79	9.23	65.28	0.07	14.79	2.87	7,935.23
Other buildings	0.86	1.37	9.67	0.01	2.19	0.43	1,175.27
TOTALS (lbs/day, unmitigated)	6.65	10.60	74.95	0.08	16.98	3.30	9,110.50

Operational Settings:

Does not include correction for passby trips

Does not include double counting adjustment for internal trips

Analysis Year: 2013 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
Main Building		52.37	1000 sq ft	18.23	954.71	8,566.57
Other buildings		52.37	1000 sq ft	2.70	141.40	1,268.77
					1,096.11	9,835.34

Vehicle Fleet Mix

Vehicle Type	Percent Type	Non-Catalyst	Catalyst	Diesel
Light Auto	53.3	0.4	99.4	0.2
Light Truck < 3750 lbs	6.8	1.5	97.0	1.5
Light Truck 3751-5750 lbs	23.0	0.4	99.6	0.0
Med Truck 5751-8500 lbs	10.1	1.0	99.0	0.0
Lite-Heavy Truck 8501-10,000 lbs	1.5	0.0	86.7	13.3
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	2.3	56.5	43.5	0.0

Vehicle Fleet Mix

Vehicle Type	Percent Type	Non-Catalyst	Catalyst	Diesel
School Bus	0.1	0.0	0.0	100.0
Motor Home	0.8	0.0	87.5	12.5

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)						
Main Building				2.0	1.0	97.0
Other buildings				2.0	1.0	97.0

Operational Changes to Defaults

Appendix E Whittier Narrows Nature Center GHG Emissions - 2006

2006

Area-Source Emissions

Natural Gas MMBTU/Year	Emission Factor (kg CO2/MMBTU)	GWP	Emission Factor (kg CH4/MMBTU)	GWP	Emission Factor (kg N2O/MMBTU)	GWP	CO2e (Metric Tons/Year)
16.3	53.06		1	0.001	23	0.0001	296

2006

Mobile-Source Emissions

Operational Year 2006	615.58 tons/yr	0.907 metric ton/english ton	558	Metric tons/year
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Total Direct Operational Emissions

559 Metric tons/year

Indirect Emissions from Energy Consumption

# du	KWh/sf/year	# sf Commercial	Total KWh	MWh	Region	Emission Factor (lb CO2/MWh)	GWP	Emission Factor (lb CH4/MWh)	GWP	Emission Factor (lb N2O/MWh)	GWP	Total CO2e (Metric Tons/year)
0		8	2810	22,480	22 CALI	804.54		1	0.0067	23	0.0037	296

Indirect Emissions from Water Use (includes conveyance, treatment, distribution, and wastewater treatment)

KWh/million gallons/year	KWh/acre- ft/year	Million Gallons/Year	Total KWh	MWh	Region	Emission Factor (lb CO2/MWh)	GWP	Emission Factor (lb CH4/MWh)	GWP	Emission Factor (lb N2O/MWh)	GWP	Total CO2e (Metric Tons/year)
12,700	4138	7	93,472		93 CALI	804.54		1	0.0067	23	0.0037	296

TOTAL DIRECT AND INDIRECT OPERATIONAL EMISSIONS

602 Metric tons/year

Sources:

California Energy Commission [CEC] 2000. California Energy Demand Staff Report P200-00-002

California Climate Action Registry [CCAR] General Reporting Protocol v 3.0 April 2008

California Energy Commission [CEC] 2005. California Energy - Water Relationship Staff Report CEC-700-2005-011-SF

Appendix E Whittier Narrows Nature Center GHG Emissions - 2013

URBEMIS Output Summary		CO2 Estimates		Conversion Factors		Total CO2 Emissions		
Construction Emissions								
2011	62.2 tons/yr		0.907 metric ton/english ton			56	Metric tons/year	
2012	283.57 tons/yr		0.907 metric ton/english ton			257	Metric tons/year	
2013	55.21 tons/yr		0.907 metric ton/english ton			50	Metric tons/year	
Total Construction Emissions							364	Metric tons
2013								
Area-Source Emissions								
Operational Year 2013		31.56 tons/yr	0.907 metric ton/english ton			29	Metric tons/year	
2013								
Mobile-Source Emissions								
Operational Year 2013		2,393.34 tons/yr	0.907 metric ton/english ton			2,171	Metric tons/year	
Total Direct Operational Emissions							2,200	Metric tons/year

Indirect Emissions from Energy Consumption

# du	KWh/sf/year	# sf Commercial	Total KWh	MWh	Region	Emission Factor (lb CO2/MWh)	GWP	Emission Factor (lb CH4/MWh)	GWP	Emission Factor (lb N2O/MWh)	GWP	Total CO2e (Metric Tons/year)	
0		4	18230	72,920	73 CALI	804.54		1	0.0067	23	0.0037	296	27

Indirect Emissions from Water Use (includes conveyance, treatment, distribution, and wastewater treatment)

KWh/million gallons/year	KWh/acre-ft/year	Million Gallons/Year	Total KWh	MWh	Region	Emission Factor (lb CO2/MWh)	GWP	Emission Factor (lb CH4/MWh)	GWP	Emission Factor (lb N2O/MWh)	GWP	Total CO2e (Metric Tons/year)	
12,700	4138	39	500,634		501 CALI	804.54		1	0.0067	23	0.0037	296	183

TOTAL DIRECT AND INDIRECT OPERATIONAL EMISSIONS **2,409** Metric tons/year

Sources:

- California Energy Commission [CEC] 2000. California Energy Demand Staff Report P200-00-002
- California Climate Action Registry [CCAR] General Reporting Protocol v 3.0 April 2008
- California Energy Commission [CEC] 2005. California Energy - Water Relationship Staff Report CEC-700-2005-011-SF

