

## **Appendix A: Air Quality Modeling Output**

**Supporting Air Quality Information  
for the Enhanced Outpatient Program:  
General Population Treatment  
and Office Space,  
Salinas Valley State Prison**

Prepared for:



**California Department of Corrections and Rehabilitation**  
Facilities Planning, Construction, and Management Division  
9838 Old Placerville Road, Suite B  
Sacramento, CA 95827

Contact: Jane Hershberger, Senior Environmental Planner

Prepared by:

**Michael Brandman Associates**  
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Contact: Trevor Macenski, REA, Project Manager  
Author: Cori Wilson, Air Quality and Climate Change Specialist



Michael Brandman Associates

July 1, 2010

# AMBAG

ASSOCIATION OF MONTEREY BAY AREA GOVERNMENTS

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July 21, 2009

Chryss Meier, Assistant Project Manager / Air Quality Scientist  
Michael Brandman Associates  
2000 "O" Street, Suite 200  
Sacramento, CA 95811

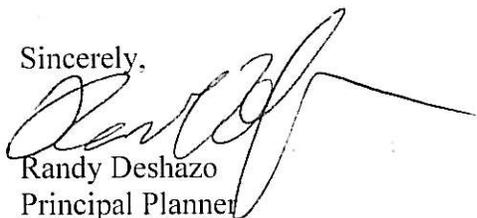
Dear Chryss:

This letter is in response to your June 2009 request for a determination of consistency of the Salinas Valley State Prison project with the *Air Quality Management Plan for the Monterey Bay Region (AQMP)*.

Pursuant to recent conversations with the Air District, consistency of this project is determined by comparing the estimated current employment of the air basin in which the project is located with the applicable employment forecast in the AQMP. If the estimated employment delta in the project and associated trips does not exceed the forecast, indirect emissions associated with the project are deemed to be consistent with the AQMP.

Therefore the project is deemed consistent with the 2008 regional forecasts and the Air Quality Management Plan.

Sincerely,



Randy Deshazo  
Principal Planner

cc: Jean Getchell, MBUAPCD

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Urbemis 2007 Version 9.2.4

Combined Summer Emissions Reports (Pounds/Day)

File Name: C:\MBA\Client\11540007 Salinas Valley State Prison\Air Quality 2nd Project\Modeling\SalinasPrison.urb924

Project Name: Salinas Valley State Prison

Project Location: Monterey County

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)	0.29	0.20	1.70	0.00	0.01	0.01	220.17

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)	0.59	0.72	5.57	0.00	0.90	0.18	494.10

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)	0.88	0.92	7.27	0.00	0.91	0.19	714.27

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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	0.01	0.18	0.15	0.00	0.00	0.00	217.36
Hearth - No Summer Emissions							
Landscape	0.12	0.02	1.55	0.00	0.01	0.01	2.81
Consumer Products	0.00						
Architectural Coatings	0.16						
<b>TOTALS (lbs/day, unmitigated)</b>	<b>0.29</b>	<b>0.20</b>	<b>1.70</b>	<b>0.00</b>	<b>0.01</b>	<b>0.01</b>	<b>220.17</b>

Area Source Changes to Defaults

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>
Government office building	0.59	0.72	5.57	0.00	0.90	0.18	494.10
<b>TOTALS (lbs/day, unmitigated)</b>	<b>0.59</b>	<b>0.72</b>	<b>5.57</b>	<b>0.00</b>	<b>0.90</b>	<b>0.18</b>	<b>494.10</b>

Operational Settings:

Does not include correction for passby trips

Does not include double counting adjustment for internal trips

Analysis Year: 2014 Temperature (F): 70 Season: Summer

Emfac: Version : Emfac2007 V2.3 Nov 1 2006

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Summary of Land Uses

Land Use Type	Acreage	Trip Rate	Unit Type	No. Units	Total Trips	Total VMT
Government office building		3.68	1000 sq ft	27.17	99.99	513.93
					99.99	513.93

Vehicle Fleet Mix

Vehicle Type	Percent Type	Non-Catalyst	Catalyst	Diesel
Light Auto	45.3	0.4	99.4	0.2
Light Truck < 3750 lbs	15.9	0.6	95.6	3.8
Light Truck 3751-5750 lbs	20.4	0.5	99.0	0.5
Med Truck 5751-8500 lbs	9.5	0.0	100.0	0.0
Lite-Heavy Truck 8501-10,000 lbs	1.5	0.0	73.3	26.7
Lite-Heavy Truck 10,001-14,000 lbs	0.9	0.0	55.6	44.4
Med-Heavy Truck 14,001-33,000 lbs	1.3	0.0	23.1	76.9
Heavy-Heavy Truck 33,001-60,000 lbs	0.5	0.0	0.0	100.0
Other Bus	0.2	0.0	50.0	50.0
Urban Bus	0.0	0.0	0.0	0.0
Motorcycle	3.5	54.3	45.7	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			Commute	Commercial	
	Home-Work	Home-Shop	Home-Other		Non-Work	Customer
Urban Trip Length (miles)	11.8	8.3	7.1	11.8	4.4	4.4

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Travel Conditions

	Residential			Commuter	Commercial	
	Home-Work	Home-Shop	Home-Other		Non-Work	Customer
Rural Trip Length (miles)	11.8	8.3	7.1	11.8	4.4	4.4
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)						
Government office building				10.0	5.0	85.0

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Urbemis 2007 Version 9.2.4

Combined Winter Emissions Reports (Pounds/Day)

File Name: C:\MBA\Client\11540007 Salinas Valley State Prison\Air Quality 2nd Project\Modeling\SalinasPrison.urb924

Project Name: Salinas Valley State Prison

Project Location: Monterey County

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)	0.17	0.18	0.15	0.00	0.00	0.00	217.36

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)	0.57	0.89	6.37	0.00	0.90	0.18	487.42

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)	0.74	1.07	6.52	0.00	0.90	0.18	704.78

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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	0.01	0.18	0.15	0.00	0.00	0.00	217.36
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	0.16						
<b>TOTALS (lbs/day, unmitigated)</b>	<b>0.17</b>	<b>0.18</b>	<b>0.15</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>217.36</b>

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>
Government office building	0.57	0.89	6.37	0.00	0.90	0.18	487.42
<b>TOTALS (lbs/day, unmitigated)</b>	<b>0.57</b>	<b>0.89</b>	<b>6.37</b>	<b>0.00</b>	<b>0.90</b>	<b>0.18</b>	<b>487.42</b>

Operational Settings:

Does not include correction for passby trips

Does not include double counting adjustment for internal trips

Analysis Year: 2014 Temperature (F): 50 Season: Winter

Emfac: Version : Emfac2007 V2.3 Nov 1 2006

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Summary of Land Uses

Land Use Type	Acreage	Trip Rate	Unit Type	No. Units	Total Trips	Total VMT
Government office building		3.68	1000 sq ft	27.17	99.99	513.93
					99.99	513.93

Vehicle Fleet Mix

Vehicle Type	Percent Type	Non-Catalyst	Catalyst	Diesel
Light Auto	45.3	0.4	99.4	0.2
Light Truck < 3750 lbs	15.9	0.6	95.6	3.8
Light Truck 3751-5750 lbs	20.4	0.5	99.0	0.5
Med Truck 5751-8500 lbs	9.5	0.0	100.0	0.0
Lite-Heavy Truck 8501-10,000 lbs	1.5	0.0	73.3	26.7
Lite-Heavy Truck 10,001-14,000 lbs	0.9	0.0	55.6	44.4
Med-Heavy Truck 14,001-33,000 lbs	1.3	0.0	23.1	76.9
Heavy-Heavy Truck 33,001-60,000 lbs	0.5	0.0	0.0	100.0
Other Bus	0.2	0.0	50.0	50.0
Urban Bus	0.0	0.0	0.0	0.0
Motorcycle	3.5	54.3	45.7	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			Commute	Commercial	
	Home-Work	Home-Shop	Home-Other		Non-Work	Customer
Urban Trip Length (miles)	11.8	8.3	7.1	11.8	4.4	4.4

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Travel Conditions

	Residential			Commuter	Commercial	
	Home-Work	Home-Shop	Home-Other		Non-Work	Customer
Rural Trip Length (miles)	11.8	8.3	7.1	11.8	4.4	4.4
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)						
Government office building				10.0	5.0	85.0

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Urbemis 2007 Version 9.2.4

Combined Annual Emissions Reports (Tons/Year)

File Name: C:\MBA\Client\11540007 Salinas Valley State Prison\Air Quality 2nd Project\Modeling\SalinasPrison.urb924

Project Name: Salinas Valley State Prison

Project Location: Monterey County

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>CO2</u>
TOTALS (tons/year, unmitigated)	39.92

OPERATIONAL (VEHICLE) EMISSION ESTIMATES

	<u>CO2</u>
TOTALS (tons/year, unmitigated)	89.77

SUM OF AREA SOURCE AND OPERATIONAL EMISSION ESTIMATES

	<u>CO2</u>
TOTALS (tons/year, unmitigated)	129.69

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Area Source Unmitigated Detail Report:

AREA SOURCE EMISSION ESTIMATES Annual Tons Per Year, Unmitigated

<u>Source</u>	<u>CO2</u>
Natural Gas	39.67
Hearth	0.00
Landscape	0.25
Consumer Products	
Architectural Coatings	
TOTALS (tons/year, unmitigated)	39.92

Area Source Changes to Defaults

Operational Unmitigated Detail Report:

OPERATIONAL EMISSION ESTIMATES Annual Tons Per Year, Unmitigated

<u>Source</u>	<u>CO2</u>
Government office building	89.77
TOTALS (tons/year, unmitigated)	89.77

Operational Settings:

Does not include correction for passby trips

Does not include double counting adjustment for internal trips

Analysis Year: 2014 Season: Annual

Emfac: Version : Emfac2007 V2.3 Nov 1 2006

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Summary of Land Uses

Land Use Type	Acreage	Trip Rate	Unit Type	No. Units	Total Trips	Total VMT
Government office building		3.68	1000 sq ft	27.17	99.99	513.93
					99.99	513.93

Vehicle Fleet Mix

Vehicle Type	Percent Type	Non-Catalyst	Catalyst	Diesel
Light Auto	45.3	0.4	99.4	0.2
Light Truck < 3750 lbs	15.9	0.6	95.6	3.8
Light Truck 3751-5750 lbs	20.4	0.5	99.0	0.5
Med Truck 5751-8500 lbs	9.5	0.0	100.0	0.0
Lite-Heavy Truck 8501-10,000 lbs	1.5	0.0	73.3	26.7
Lite-Heavy Truck 10,001-14,000 lbs	0.9	0.0	55.6	44.4
Med-Heavy Truck 14,001-33,000 lbs	1.3	0.0	23.1	76.9
Heavy-Heavy Truck 33,001-60,000 lbs	0.5	0.0	0.0	100.0
Other Bus	0.2	0.0	50.0	50.0
Urban Bus	0.0	0.0	0.0	0.0
Motorcycle	3.5	54.3	45.7	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			Commute	Commercial	
	Home-Work	Home-Shop	Home-Other		Non-Work	Customer
Urban Trip Length (miles)	11.8	8.3	7.1	11.8	4.4	4.4

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Travel Conditions

	Residential			Commuter	Commercial	
	Home-Work	Home-Shop	Home-Other		Non-Work	Customer
Rural Trip Length (miles)	11.8	8.3	7.1	11.8	4.4	4.4
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)						
Government office building				10.0	5.0	85.0

**Summary of Operational Greenhouse Gases**

Project: EOP - GP Treatment and Office Space at Salinas Valley State Prison  
 Prepared by: Michael Brandman Associates  
 Prepared on: 30-Jun-10  
 Year of analysis: 2014

Source	<i>Emissions (tons per year)</i>				Metric Tons CO2e
	Carbon Dioxide	Nitrous Oxide	Methane	Other	
Motor vehicles	90	0.005	0.009		83
Natural gas	40	0.0003	0.014		37
Indirect electricity	148	0.002	0.006		135
Water transport	18	0.000	0.001		17
Waste					19
Refrigerants				0.02	25
<b>Total</b>	<b>296</b>	<b>0.007</b>	<b>0.030</b>	<b>0.02</b>	<b>316</b>

Total	269	0.01	0.03	0.02 metric tons per year
GWP	1	310	21	varies
Total	269	2	1	25 MTCO2E per year
Total	0.0003	0.0000	0.0000	0.0000 MMTCO2E per year

Total - all gases 316 MTCO2e per year  
 0.0003 MMTCO2e per year

California emissions in 2004 500 MMTCO2e per year  
 Project percent of emissions 0.000063%

U.S. emissions in 2005 7,260.4  
 Project percent of emissions 0.000004%

Global emissions in 2004 20135  
 Project percent of emissions 0.000002%

Last updated 4/14/10

Notes:

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).

Motor vehicle carbon dioxide and natural gas carbon dioxide values are from the URBEMIS2007 output.

**Mobile Emissions - Methane**

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EOP - GP Treatment and Office Space at Salinas Valley State Prison

30-Jun-10

Prepared by Michael Brandman Associates

**Vehicle Miles Traveled 514**

**Vehicle Trips 100**

	Pounds/day	Tons/day	Tons/year
<b>Starting Emissions</b>	0.01	0.0000	0.00
<b>Running Emissions</b>	0.04	0.0000	0.01
<b>Total</b>	0.05	0.0000	0.01

**Vehicle Percentages**

Vehicle Type	Percent	Non-Catalyst	Catalyst	Diesel
Light Auto	51.5	0.6	99.2	0.2
Light Truck < 3,750 lbs	7.3	1.4	95.9	2.7
Light Truck 3,751- 5,750	23.0	0.4	99.6	0.0
Med Truck 5,751- 8,500	10.7	0.9	99.1	0.0
Lite-Heavy 8,501-10,000	1.6	0.0	81.2	18.8
Lite-Heavy 10,001-14,000	0.5	0.0	60.0	40.0
Med-Heavy 14,001-33,000	0.9	0.0	22.2	77.8
Heavy-Heavy 33,001-60,000	0.5	0.0	0.0	100.0
Line Haul > 60,000 lbs	0.1	0.0	0.0	100.0
Urban Bus	0.1	0.0	0.0	100.0
Motorcycle	2.8	60.7	39.3	0.0
School Bus	0.1	0.0	0.0	100.0
Motor Home	0.9	0.0	88.9	11.1

**Running Emission Factors (g/mile)**

Vehicle Type	Type	Non-Catalyst	Catalyst	Diesel
Light Auto	LDA	0.3250	0.0250	0.0080
Light Truck < 3,750 lbs	LDT1	0.3310	0.0330	0.0040
Light Truck 3,751- 5,750	LDT2	0.3300	0.0300	0.0060
Med Truck 5,751- 8,500	MDV	0.3910	0.0370	0.0030
Lite-Heavy 8,501-10,000	LHDT1	0.2500	0.0280	0.0070
Lite-Heavy 10,001-14,000	LHDT2	0.2500	0.0330	0.0100
Med-Heavy 14,001-33,000	MHDT	0.3210	0.0720	0.0100
Heavy-Heavy 33,001-60,000	HHDT	0.7950	0.2250	0.0480
Line Haul > 60,000 lbs	LHV	0.7950	0.2250	0.0480
Urban Bus	UB	0.3680	0.0920	0.0280
Motorcycle	MCY	0.2230	0.1620	0.0000
School Bus	SBUS	0.3210	0.1260	0.0130
Motor Home	MH	0.3210	0.0560	0.0050

**Running Emissions (pounds per day)**

Vehicle Type	Non-Catalyst	Catalyst	Diesel
Light Auto	0.00	0.01	0.00
Light Truck < 3,750 lbs	0.00	0.00	0.00
Light Truck 3,751- 5,750	0.00	0.01	0.00
Med Truck 5,751- 8,500	0.00	0.00	0.00
Lite-Heavy 8,501-10,000	0.00	0.00	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	0.00	0.00
<b>Total</b>	<b>0.01</b>	<b>0.03</b>	<b>0.00</b>

**Mobile Emissions - Methane**

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EOP - GP Treatment and Office Space at Salinas Valley State Prison  
 Prepared by Michael Brandman Associates

**Total Trips** 100

**Starting Emission Factors (g/start)**

Vehicle Type	Type	Non-Catalyst	Catalyst	Diesel
Light Auto	LDA	0.384	0.032	0
Light Truck < 3,750 lbs	LDT1	0.381	0.038	0.000
Light Truck 3,751- 5,750	LDT2	0.377	0.034	0.000
Med Truck 5,751- 8,500	MDV	0.463	0.044	0.000
Lite-Heavy 8,501-10,000	LHDT1	0.615	0.106	0.000
Lite-Heavy 10,001-14,000	LHDT2	0.615	0.123	0.000
Med-Heavy 14,001-33,000	MHDT	0.923	0.277	0.000
Heavy-Heavy 33,001-60,000	HHDT	1.756	0.829	0.000
Line Haul > 60,000 lbs	LHV	1.756	0.829	0.000
Urban Bus	UB	1.127	0.314	0.000
Motorcycle	MCY	0.183	0.155	0.000
School Bus	SBUS	0.923	0.313	0.000
Motor Home	MH	0.923	0.200	0.000

**Trip Distribution**

Vehicle Type	Type	Non-Catalyst	Catalyst	Diesel
Light Auto	LDA	0.3	51.1	0.1
Light Truck < 3,750 lbs	LDT1	0.1	7.0	0.2
Light Truck 3,751- 5,750	LDT2	0.1	22.9	0.0
Med Truck 5,751- 8,500	MDV	0.1	10.6	0.0
Lite-Heavy 8,501-10,000	LHDT1	0.0	1.3	0.3
Lite-Heavy 10,001-14,000	LHDT2	0.0	0.3	0.2
Med-Heavy 14,001-33,000	MHDT	0.0	0.2	0.7
Heavy-Heavy 33,001-60,000	HHDT	0.0	0.0	0.5
Line Haul > 60,000 lbs	LHV	0.0	0.0	0.1
Urban Bus	UB	0.0	0.0	0.1
Motorcycle	MCY	1.7	1.1	0.0
School Bus	SBUS	0.0	0.0	0.1
Motor Home	MH	0.0	0.8	0.1
Total		2.3	95.3	2.4

**Starting Emissions (pounds per day)**

Vehicle Type	Type	Non-Catalyst	Catalyst	Diesel
Light Auto	LDA	0.0003	0.0036	0.0000
Light Truck < 3,750 lbs	LDT1	0.0001	0.0006	0.0000
Light Truck 3,751- 5,750	LDT2	0.0001	0.0017	0.0000
Med Truck 5,751- 8,500	MDV	0.0001	0.0010	0.0000
Lite-Heavy 8,501-10,000	LHDT1	0.0000	0.0003	0.0000
Lite-Heavy 10,001-14,000	LHDT2	0.0000	0.0001	0.0000
Med-Heavy 14,001-33,000	MHDT	0.0000	0.0001	0.0000
Heavy-Heavy 33,001-60,000	HHDT	0.0000	0.0000	0.0000
Line Haul > 60,000 lbs	LHV	0.0000	0.0000	0.0000
Urban Bus	UB	0.0000	0.0000	0.0000
Motorcycle	MCY	0.0007	0.0004	0.0000
School Bus	SBUS	0.0000	0.0000	0.0000
Motor Home	MH	0.0000	0.0004	0.0000
Total		0.0012	0.0082	0.0000

- Source of vehicle percentages: URBEMIS.  
 - Source of emission factors: EMFAC2007, Statewide average, year 2010, temperature 60F, relative humidity 50%

**Mobile Emissions - Nitrous Oxide**

Page 1

EOP - GP Treatment and Office Space at Sal **Vehicle Miles Traveled**

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Prepared by Michael Brandman Associates

	Pounds/day	Tons/day	Tons/year
<b>Starting Emissions</b>	0.01	0.0000	0.00
<b>Running Emissions</b>	0.02	0.0000	0.00
<b>Total</b>	0.03	0.0000	0.00

**Vehicle Percentages**

<u>Vehicle Type</u>	<u>Percent</u>	<u>Non-Catalyst</u>	<u>Catalyst</u>	<u>Diesel</u>
Light Auto	51.5	0.6	99.2	0.2
Light Truck < 3,750 lbs	7.3	1.4	95.9	2.7
Light Truck 3,751- 5,750	23.0	0.4	99.6	0.0
Med Truck 5,751- 8,500	10.7	0.9	99.1	0.0
Lite-Heavy 8,501-10,000	1.6	0.0	81.2	18.8
Lite-Heavy 10,001-14,000	0.5	0.0	60.0	40.0
Med-Heavy 14,001-33,000	0.9	0.0	22.2	77.8
Heavy-Heavy 33,001-60,000	0.5	0.0	0.0	100.0
Line Haul > 60,000 lbs	0.1	0.0	0.0	100.0
Urban Bus	0.1	0.0	0.0	100.0
Motorcycle	2.8	60.7	39.3	0.0
School Bus	0.1	0.0	0.0	100.0
Motor Home	0.9	0.0	88.9	11.1

**Running Emission Factors (mg/km)**

<u>Vehicle Type</u>	<u>Non-Catalyst</u>	<u>Catalyst</u>	<u>Diesel</u>
Automobile	8	20	1
Light duty truck	9	26	1
Heavy duty trucks and buses	20	55	3
Motorcycle	3	3	3

**Running Emission Factors (g/mile)**

<u>Vehicle Type</u>	<u>Type</u>	<u>Non-Catalyst</u>	<u>Catalyst</u>	<u>Diesel</u>
Light Auto	LDA	0.0050	0.0124	0.0006
Light Truck < 3,750 lbs	LDT1	0.0056	0.0162	0.0006
Light Truck 3,751- 5,750	LDT2	0.0056	0.0162	0.0006
Med Truck 5,751- 8,500	MDV	0.0056	0.0162	0.0006
Lite-Heavy 8,501-10,000	LHDT1	0.0124	0.0342	0.0019
Lite-Heavy 10,001-14,000	LHDT2	0.0124	0.0342	0.0019
Med-Heavy 14,001-33,000	MHDT	0.0124	0.0342	0.0019
Heavy-Heavy 33,001-60,000	HHDT	0.0124	0.0342	0.0019
Line Haul > 60,000 lbs	LHV	0.0124	0.0342	0.0019
Urban Bus	UB	0.0124	0.0342	0.0019
Motorcycle	MCY	0.0019	0.0019	0.0019
School Bus	SBUS	0.0124	0.0342	0.0019
Motor Home	MH	0.0124	0.0342	0.0019

**Running Emissions (pounds per day)**

<u>Vehicle Type</u>	<u>Non-Catalyst</u>	<u>Catalyst</u>	<u>Diesel</u>
Light Auto	0.00	0.01	0.00
Light Truck < 3,750 lbs	0.00	0.00	0.00
Light Truck 3,751- 5,750	0.00	0.00	0.00
Med Truck 5,751- 8,500	0.00	0.00	0.00
Lite-Heavy 8,501-10,000	0.00	0.00	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	0.00	0.00
<b>Total</b>	<b>0.00</b>	<b>0.02</b>	<b>0.00</b>

**Mobile Emissions - Nitrous Oxide**

Page 2

**Total Trips** 100

**Starting Emission Factors (mg/start)**

<u>Vehicle Type</u>	<u>Non-Catalyst</u>	<u>Catalyst</u>	<u>Diesel</u>
Automobile	28	72	0
Light duty truck	9	26	-1
Heavy duty trucks and buses	70	194	-2
Motorcycle	12	12	0

**Starting Emission Factors (g/start)**

<u>Vehicle Type</u>	<u>Type</u>	<u>Non-Catalyst</u>	<u>Catalyst</u>	<u>Diesel</u>
Light Auto	LDA	0.028	0.072	0
Light Truck < 3,750 lbs	LDT1	0.009	0.026	-0.001
Light Truck 3,751- 5,750	LDT2	0.009	0.026	-0.001
Med Truck 5,751- 8,500	MDV	0.009	0.026	-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	0.000
School Bus	SBUS	0.070	0.194	-0.002
Motor Home	MH	0.070	0.194	-0.002

**Trip Distribution**

<u>Vehicle Type</u>	<u>Type</u>	<u>Non-Catalyst</u>	<u>Catalyst</u>	<u>Diesel</u>
Light Auto	LDA	0.3	51.1	0.1
Light Truck < 3,750 lbs	LDT1	0.1	7.0	0.2
Light Truck 3,751- 5,750	LDT2	0.1	22.9	0.0
Med Truck 5,751- 8,500	MDV	0.1	10.6	0.0
Lite-Heavy 8,501-10,000	LHDT1	0.0	1.3	0.3
Lite-Heavy 10,001-14,000	LHDT2	0.0	0.3	0.2
Med-Heavy 14,001-33,000	MHDT	0.0	0.2	0.7
Heavy-Heavy 33,001-60,000	HHDT	0.0	0.0	0.5
Line Haul > 60,000 lbs	LHV	0.0	0.0	0.1
Urban Bus	UB	0.0	0.0	0.1
Motorcycle	MCY	1.7	1.1	0.0
School Bus	SBUS	0.0	0.0	0.1
Motor Home	MH	0.0	0.8	0.1
Total		2.3	95.3	2.4

**Starting Emissions (pounds per day)**

<u>Vehicle Type</u>	<u>Type</u>	<u>Non-Catalyst</u>	<u>Catalyst</u>	<u>Diesel</u>
Light Auto	LDA	0.0000	0.0081	0.0000
Light Truck < 3,750 lbs	LDT1	0.0000	0.0004	0.0000
Light Truck 3,751- 5,750	LDT2	0.0000	0.0013	0.0000
Med Truck 5,751- 8,500	MDV	0.0000	0.0006	0.0000
Lite-Heavy 8,501-10,000	LHDT1	0.0000	0.0006	0.0000
Lite-Heavy 10,001-14,000	LHDT2	0.0000	0.0001	0.0000
Med-Heavy 14,001-33,000	MHDT	0.0000	0.0001	0.0000
Heavy-Heavy 33,001-60,000	HHDT	0.0000	0.0000	0.0000
Line Haul > 60,000 lbs	LHV	0.0000	0.0000	0.0000
Urban Bus	UB	0.0000	0.0000	0.0000
Motorcycle	MCY	0.0000	0.0000	0.0000
School Bus	SBUS	0.0000	0.0000	0.0000
Motor Home	MH	0.0000	0.0003	0.0000
Total		0.0001	0.0115	0.0000

Sources: Vehicle percentages: URBEMIS2007.  
 Emission Factors (mg/km and mg/start): 2006 IPCC Guidelines for National  
 Greenhouse Gas Inventories, Volume 2: Energy, Table 3.2.3,  
[www.ipcc-nggip.iges.or.jp/EFDB/find\\_ef\\_main.php](http://www.ipcc-nggip.iges.or.jp/EFDB/find_ef_main.php)

## Electricity - Indirect Emissions

Project: EOP - GP Treatment and Office Space at Salinas Valley State Prison  
 Prepared by: Michael Brandman Associates  
 Prepared on: 6/30/2010

<b>Land Use</b>	<b>Electricity (kWh/day)</b>	<b>Electricity Use (kWh/year)</b>
Project generation (from IS/MND)	1121	409165
<b>Total (kWh/year)</b>		<b>409165</b>
<b>Total (MWh/year)</b>		<b>409</b>

<b>Greenhouse Gas</b>	<b>Emission Factor (pounds per MWh)</b>	<b>Emissions (pounds/year)</b>	<b>Emissions (tons/year)</b>
Carbon dioxide	724.12	296,285	148
Methane	0.0302	12	0.01
Nitrous oxide	0.0081	3	0.00

Emission factor source: California Climate Action Registry. General Reporting Protocol. Reporting Entity-Wide Greenhouse Gas Emissions. Version 3.1, January 2009. Table C.2  
[www.climateregistry.org/resources/docs/protocols/grp/GRP\\_3.1\\_January2009.pdf](http://www.climateregistry.org/resources/docs/protocols/grp/GRP_3.1_January2009.pdf)

## Water Conveyance, Treatment, Distribution

Project: EOP - GP Treatment and Office Space at Salinas Valley State  
 Prepared by: Michael Brandman Associates  
 Prepared on: 6/30/2010

<u>Electricity Requirements</u>	kWh per million gallons	
	Northern California	Southern California
Water Supply, Conveyance	2,117	9,727
Water Treatment	111	111
Water Distribution	1,272	1,272
Wastewater Treatment	<u>1,911</u>	<u>1,911</u>
<i>Total</i>	<i>5,411</i>	<i>13,021</i>

### Project

Water Usage 10566 gallons per day  
 Water Usage 3.85659 million gallons per year  
 Energy Usage 50,217 kWh  
 Energy Usage 50 MWh

<u>Greenhouse Gas</u>	<u>Electricity Emission</u>		
	<u>Factor</u> <u>(pounds per MWh)</u>	<u>Emissions</u> <u>(pounds/year)</u>	<u>Emissions</u> <u>(tons/year)</u>
Carbon dioxide	724.12	36,363	18
Methane	0.0302	1.52	0.001
Nitrous oxide	0.0081	0.41	0.000

Source for electricity emission factor:  
 California Climate Action Registry. General Reporting Protocol. Reporting Entity-Wide Greenhouse Gas Emissions. Version 3.1, January 2009. Table C.2.  
[www.climateregistry.org/resources/docs/protocols/grp/GRP\\_3.1\\_January2009.pdf](http://www.climateregistry.org/resources/docs/protocols/grp/GRP_3.1_January2009.pdf)

Source for electricity requirements:  
 Navigant Consulting, Inc. 2006. Refining Estimates of Water-Related Energy Use in California. California Energy Commission, PIER Industrial/Agricultural/Water End Use Energy Efficiency Program. CEC-500-2006-118. [www.energy.ca.gov/pier/project\\_reports/CEC-500-2006-118.html](http://www.energy.ca.gov/pier/project_reports/CEC-500-2006-118.html)

## Natural Gas Combustion

EOP - GP Treatment and Office Space at Salinas Valley State Prison

Prepared by Michael Brandman Associates

6/30/2010

Gas	Annual Natural Gas Usage Factor* (kBTU)	Natural Gas Usage for Project (MMBTU/year)	Emission Factor (kg/MMBTU)**	Emissions (kg/year)	Emissions (tons/year)	Emissions (MTCO2e/year)
Methane	2555000.00	2555	0.005	12.8	0.014	0.27
<i>Total Methane</i>		2555		12.8	0.014	0.27
Nitrous Oxide	2555000.00	2555	0.0001	0.3	0.0003	0.08
<i>Total Nitrous Oxide</i>		2555		0.3	0.0003	0.08

Greenhouse Gas	Global Warming Potentials
Methane	21
Nitrous Oxide	310

\* Natural gas usage from the IS/MND, 70 therms per day \* 100 = 7000 kBTU per day \* 365 = 2,555,000 kBTU/year (for conversion information see [http://www.energystar.gov/ia/business/tools\\_resources/target\\_finder/help/Energy\\_Units\\_Conversion\\_Table.htm](http://www.energystar.gov/ia/business/tools_resources/target_finder/help/Energy_Units_Conversion_Table.htm))

\*\* Emission factors: Table C.8 from California Climate Action Registry, General Reporting Protocol. Version 3.1, January 2009. [www.climateregistry.org/tools/protocols/general-reporting-protocol.html](http://www.climateregistry.org/tools/protocols/general-reporting-protocol.html)

## Air Conditioning and Refrigeration Fugitive Emissions

Project: EOP - GP Treatment and Office Space at Salinas Valley State Prison  
 Prepared on: 6/28/2010

Type of Unit	Units	Capacity of Unit (pounds)	Capacity of Unit (kg)	Annual Leak Rate in percent of capacity	Emissions (kg/year)	Emissions (tons/year)	Global Warming Potential	MTCO <sub>2</sub> e per year
<b>Without Regulations</b>								
Refrigerator	1	1	0	0.5%	0.0	0.000	2065	0
Packaged chiller air conditioning (medium)	1	526	239	7%	16.7	0.018	1513	25
<b>Total</b>						<b>0.018</b>		<b>25</b>
<b>With Regulation and Mitigation</b>								
Refrigerator	1	1	0	0.5%	0.0	0.000	2065	0
Packaged chiller air conditioning (medium)	1	526	239	4%	8.4	0.009	500	4
<b>Total</b>						<b>0.009</b>		<b>4</b>

Sources:

- 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>
- California Air Resources Board. Appendix B, California Facilities and Greenhouse Gas Emissions Inventory - High-Global Warming Potential Stationary Source Refrigerant Management Program. [www.arb.ca.gov/cc/reftrack/APPENDIX\\_B\\_10\\_22\\_.pdf](http://www.arb.ca.gov/cc/reftrack/APPENDIX_B_10_22_.pdf)
- Data regarding the amount of air conditioning to be used for the project is unknown at this time. Therefore, it was assumed that there would be one packaged chiller air conditioning unit and one refrigerator.
- Global warming potential is an average of the refrigerants used. Source: Bay Area Air Quality Management District Greenhouse Gas Model, version 1.1.9 Beta.
- With regulation refers to a change in the annual leak rate pursuant to California Air Resources Board Stationary Equipment Refrigerant Management Program. <http://www.arb.ca.gov/cc/reftrack/reftrack.htm>
- Mitigation requires new refrigerants for air conditioning to have an average global warming potential less than 500.

**Waste**

Project: EOP - GP Treatment and Office Space at Salir  
 Prepared by: Michael Brandman Associates

Waste (pounds per day) 135  
**Waste (tons per year) 25**

**EPA Waste Reduction Model (WARM) Inputs**

<b>Material</b>	<b>% Generated</b>	<b>Tons Generated</b>
Aluminum Cans		0.0
Steel Cans		0.0
Copper Wire		0.0
Glass		0.0
HDPE		0.0
LDPE		0.0
PET		0.0
Corrugated Cardboard		0.0
Magazines/Third-class Mail		0.0
Newspaper		0.0
Office Paper		0.0
Phonebooks		0.0
Textbooks		0.0
Dimensional Lumber		0.0
Medium-density Fiberboard		0.0
Food Scraps	5%	1.2
Yard Trimmings	10%	2.5
Grass		0.0
Leaves		0.0
Branches		0.0
Mixed Paper (general)		0.0
Mixed Paper (primarily residential)		0.0
Mixed Paper (primarily from offices)	30%	7.4
Mixed Metals	5%	1.2
Mixed Plastics	5%	1.2
Mixed Recyclables	5%	1.2
Mixed Organics		0.0
Mixed MSW	40%	9.9
Carpet		0.0
Personal Computers		0.0
Clay Bricks		0.0
Concrete		0.0
Fly Ash		0.0
Tires		0.0
<b>Total</b>	<b>100%</b>	<b>25</b>

WARM - U.S. Environmental Protection Agency. November 2009. Waste Reduction Model. [www.epa.gov/climatechange/wyacd/waste/calculators/Warm\\_home.html](http://www.epa.gov/climatechange/wyacd/waste/calculators/Warm_home.html)

Percent waste generated estimated based on experience.



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

JOB: Soledad Prison Rd/ US 101 NB Ramps  
 RUN: Hour 1 (WORST CASE ANGLE)  
 POLLUTANT: Carbon Monoxide

I. SITE VARIABLES

U= 1.0 M/S                      Z0= 100. CM                      ALT= 53. (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= 11.0 DEGREE (C)

II. LINK VARIABLES

LINK DESCRIPTION	* X1	COORDINATES (M) Y1	* X2	COORDINATES (M) Y2	* TYPE	VPH	EF (G/MI)	H (M)	W (M)
A. NB External	4	0	4	600	AG	491	1.5	.0	10.0
B. NB Approach	4	600	4	752	AG	473	2.4	.0	10.0
C. NB Depart	4	752	4	903	AG	862	2.4	.0	10.0
D. NB External	4	903	4	1503	AG	862	1.5	.0	10.0
E. NB Left	4	600	2	752	AG	18	2.4	.0	10.0
F. SB Left	0	903	2	752	AG	0	2.4	.0	10.0
G. SB External	0	1503	0	903	AG	66	1.5	.0	10.0
H. SB Approach	0	903	0	752	AG	66	2.4	.0	10.0
I. SB Depart	0	752	0	600	AG	39	2.4	.0	10.0
J. SB External	0	600	0	0	AG	39	1.5	.0	10.0
K. EB External	-750	750	-150	750	AG	0	1.5	.0	10.0
L. EB Approach	-150	750	2	750	AG	0	2.4	.0	10.0
M. EB Depart	2	750	154	750	AG	0	2.4	.0	10.0
N. EB External	154	750	754	750	AG	0	1.5	.0	10.0
O. WB External	754	753	154	753	AG	399	1.5	.0	10.0
P. WB Approach	154	753	2	753	AG	390	2.4	.0	10.0
Q. WB Depart	2	753	-150	753	AG	55	2.4	.0	10.0
R. WB External	-150	753	-750	753	AG	55	1.5	.0	10.0
S. EB Left	-150	750	2	752	AG	0	2.4	.0	10.0
T. WB Left	154	753	2	752	AG	9	2.4	.0	10.0

III. RECEPTOR LOCATIONS

RECEPTOR	* X	COORDINATES (M) Y	* Z
1. Receptor	-5	745	2.0
2. Receptor	9	745	2.0
3. Receptor	9	758	2.0
4. Receptor	-5	758	2.0

IV. MODEL RESULTS (WORST CASE WIND ANGLE )

RECEPTOR	* BRG (DEG)	* PRED CONC (PPM)	A	B	C	CONC/LINK (PPM)				
						D	E	F	G	H
1. Receptor	5.	.2	.0	.0	.1	.0	.0	.0	.0	.0
2. Receptor	356.	.3	.0	.0	.2	.0	.0	.0	.0	.0
3. Receptor	356.	.3	.0	.0	.3	.0	.0	.0	.0	.0
4. Receptor	93.	.2	.0	.0	.0	.0	.0	.0	.0	.0

RECEPTOR	I	J	K	L	M	CONC/LINK (PPM)						
						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	.0	.0	.0	.0	.0	.0	.0	.0
3. Receptor	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
4. Receptor	.0	.0	.0	.0	.0	.0	.0	.1	.0	.0	.0	.0

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