APPENDIX D
Air Quality

Appendix D contains the following components:

D.1 Construction Calculations
D.2 Operational Calculations
D.3 Health Risk Analysis

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D.1
Construction Calculations

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Offsite Soil Transport Trips

Rail Truck Trips = 173400 (Round Trips) Page 17 of Infrastructure plan
for 2.60E+06 cubic yards

Offsite haul soil = 1.13E+06 cubic yards Page 14 of Infrastructure plan
Off site truck trips = 7.54E+04 (Round trips)

365 workdays/year
Construction Period = 5 Years
4.13E+01 round trips per day (assuming 10 hour work day = 15 truck loads per hour or a truck loaded every 4 minutes)
82.58883 one way truck trips/day
30144.92 oneway trips/yr
Trip Length = 22.5 miles To Ox Mountain Landfill

Mileage travelled in SFBAAB: 678260.8 miles/year

Truck percentage on 101 ay 3rd Street 0.046 or less per Caltrans 2007
Average vehicle weight for entrained road dust calc = 3.288

EMFAC2011 emission factors for HDD trucks:	ROG	NOx	PM10	CO	PM2.5		CO2	CH4	N2O	
Assumptions:	0.141	4.51	0.049	0.656	0.045	(gm/mile)	1523	0.0051	0.0048	Emisssion factors for CH4 andNO2 from CCAR Protocol Table C4
40 mph ave										
Analysis Year 2020										
Roadway Fugitive Dust Factor			0.001143	(Lb/VMT)						
Fugitive road dust =			2.12	Lb/day						
Emissions =	96	3059	33	445	30.5	(kg/yr)	1032991	3	3	kg/yr
	210	6730	73	979	67	(lb/year)				
	0.58	**18.44**	**0.20**	**2.68**	**0.18**	**Pounds/day**				
	0.11	3.36	0.04	0.49	0.033574	Tons/Year	1136.29	0.00	0.00	ton/yr
							1030.62	0.00	0.00	Metric tons/yr
BAAQMD Threshold	54	54	82	550	54	**Pounds/day**				

GWP =	1	21	310	(GWP from IPCC 2nd Assessment Report per CCAR 2009)
eCO2 =	1030.615	0.072475	1.006931	Metric tons/yr
eCO2 =	**1031.695**			**1032 Metric tons/yr**

EMFAC 2011
2020 Estimated Annual Emission Rates
EMFAC 2011 Vehicle Categories
San Francisco COUNTY
San Francisco Bay Area AIR BASIN
Bay Area AQMD

Area	CalYr	Season	Veh	Fuel	MdlYr	Speed (Miles/hr)	Pop (Vehicles)	VMT (Miles/day	Trips (Trips/day)	ROG_RUNE (gms/mile)	ROG_IDLEX (gms/vehic	ROG_STREX (gms/vehic
San Francis	2020	Annual	T7 single cc	DSL	AllMYr	40	0	145.8044	0	0.140785	0	0

ROG_DIUR	ROG_HTSK	ROG_RUNL	ROG_RESTI	TOG_RUNE	TOG_IDLEX	TOG_STRE	TOG_DIURI	TOG_HTSK	TOG_RUNL	TOG_RESTI	CO_RUNEX	CO_IDLEX
(gms/vehic	(gms/vehic	(gms/mile)	(gms/vehic	(gms/mile)	(gms/vehic	(gms/vehic	(gms/vehic	(gms/vehic	(gms/mile)	(gms/vehic	(gms/mile)	(gms/vehic
0	0	0	0	0.160274	0	0	0	0	0	0	0.656008	0

CO_STREX	NOX_RUNE	NOX_IDLEX	NOX_STRE	CO2_RUNE	CO2_IDLEX	CO2_STRE	CO2_RUNE	CO2_IDLEX	CO2_STRE	PM10_RUN	PM10_IDLE	PM10_STR
(gms/vehic	(gms/mile)	(gms/vehic	(gms/vehic	(gms/mile)	(gms/vehic	(gms/vehic	(gms/mile)	(gms/vehic	(gms/vehic	(gms/mile)	(gms/vehic	(gms/vehic
0	4.508861	0	0	1691.798	0	0	1522.618	0	0	0.049217	0	0

PM10_PM	PM10_PMI	PM2_5_RU	PM2_5_IDI	PM2_5_STI	PM2_5_PM	PM2_5_PM	SOX_RUNE	SOX_IDLEX	SOX_STREX
(gms/mile)	(gms/mile)	(gms/mile)	(gms/vehic	(gms/vehic	(gms/mile)	(gms/mile)	(gms/mile)	(gms/vehic	(gms/vehicle/day)
0	0	0.04528	0	0	0	0	0	0	0

This Spreadsheet adds the emissions from soil transport to thoise calculated by URBEMIS.
URBEMIS calculations included export of 22000 cy of soil associated with the RAP
Assume transport of soil to rail yard occurs in Phase 1 and transport of soil offsite occurs in Phase 2

This sheet for Phase 2 only

Phase 2 Construction Emissions from URBEMIS2007

Developer Sponsored Project Construction				
2020	4.18	31.83	1.27	1.17
2021	8.78	53.91	3.01	2.65
2022	8.75	53.71	3.00	2.64
2023	**136.48**	**61.36**	3.59	3.19
2024	**128.72**	7.71	0.60	0.55
2025	**128.23**	7.68	0.60	0.55
2026	0.68	3.77	0.29	0.27
BAAQMD Thr	54	54	82	54
Exceeds Thre	Yes	Yes	No	No
Developer Sponsored Project Entertainment variant Construction				
2020	5.69	42.60	1.64	1.51
2021	25.92	170.02	9.13	8.06
2022	25.82	169.37	9.09	8.03
2023	345.62	177.21	9.70	8.58
2024	322.26	7.90	0.61	0.56
2025	321.03	7.87	0.61	0.56
2026	0.80	3.83	0.29	0.27
BAAQMD Thr	54	54	82	54
Exceeds Thre	Yes	Yes	No	No
Community Preferred Plan Construction				
2020	4.18	31.83	1.27	1.17
2021	7.72	50.96	2.67	2.37
2022	7.69	50.77	2.66	2.36
2023	**87.01**	**58.37**	3.25	2.90
2024	**79.93**	7.66	0.60	0.55
2025	**79.62**	7.63	0.59	0.55
2026	0.65	3.75	0.29	0.27
BAAQMD Thr	54	54	82	54
Exceeds Thre	Yes	Yes	No	No
Community Preferred Plan Recology variant Construction				
2020	4.18	31.83	1.27	1.17
2021	7.48	48.61	2.58	2.29
2022	7.45	48.42	2.57	2.28
2023	**90.34**	**56.02**	3.16	2.82
2024	**83.52**	7.66	0.60	0.55
2025	**83.20**	7.63	0.59	0.55
2026	0.65	3.76	0.29	0.27
BAAQMD Thr	54	54	82	54
Exceeds Thre	Yes	Yes	No	No

Emissions with Soil Tranport

	ROG	Nox	PM10	PM2.5
2020	4.75	50.27	1.47	1.35
2021	9.36	**72.35**	3.21	2.84
2022	9.32	**72.15**	3.20	2.83
2023	**137.06**	**79.79**	3.80	3.37
2024	**129.30**	26.14	0.80	0.73
2025	**128.80**	26.11	0.80	0.73
2026	1.26	22.21	0.49	0.45

	ROG	Nox	PM10	PM2.5
2020	6.27	61.04	1.84	1.69
2021	26.49	188.46	9.33	8.24
2022	26.39	187.81	9.29	8.21
2023	346.20	195.65	9.90	8.77
2024	322.84	26.34	0.81	0.74
2025	321.61	26.31	0.81	0.74
2026	1.38	22.27	0.49	0.45

	ROG	Nox	PM10	PM2.5
2020	4.75	50.27	1.47	1.35
2021	8.30	**69.40**	2.87	2.55
2022	8.27	**69.21**	2.86	2.54
2023	**87.59**	**76.80**	3.45	3.09
2024	**80.51**	26.09	0.80	0.73
2025	**80.20**	26.06	0.79	0.73
2026	1.23	22.19	0.49	0.45

	ROG	Nox	PM10	PM2.5
2020	4.75	50.27	1.47	1.35
2021	8.06	**67.05**	2.78	2.47
2022	8.03	**66.86**	2.77	2.46
2023	**90.91**	**74.46**	3.36	3.00
2024	**84.10**	26.10	0.80	0.73
2025	**83.78**	26.07	0.79	0.73
2026	1.23	22.19	0.49	0.45

Revised Phase 2 emissions with OFFROAD and EMFAC2011 corrections

	ROG	**Nox**	**PM10**	**PM2.5**
2020	**3.11**	**45.80**	**0.98**	**0.91**
2021	**10.81**	**82.36**	**1.15**	**1.05**
2022	**10.77**	**82.12**	**1.15**	**1.05**
2023	**137.74**	**87.46**	**1.62**	**1.48**
2024	**67.51**	**23.98**	**0.64**	**0.58**
2025	**67.25**	**23.96**	**0.63**	**0.58**
2026	**0.93**	**21.15**	**0.41**	**0.38**

	ROG	**Nox**	**PM10**	**PM2.5**
2020	**4.03**	**55.06**	**1.20**	**1.12**
2021	**18.02**	**201.22**	**2.66**	**2.47**
2022	**17.96**	**200.52**	**2.65**	**2.46**
2023	**347.92**	**217.79**	**4.03**	**3.66**
2024	**168.15**	**24.12**	**0.64**	**0.59**
2025	**167.51**	**24.10**	**0.64**	**0.59**
2026	**0.99**	**21.19**	**0.42**	**0.38**

	ROG	**Nox**	**PM10**	**PM2.5**
2020	**3.11**	**45.80**	**0.98**	**0.91**
2021	**5.78**	**73.23**	**0.92**	**0.86**
2022	**5.76**	**73.02**	**0.92**	**0.85**
2023	**88.02**	**84.10**	**1.48**	**1.36**
2024	**42.14**	**23.94**	**0.63**	**0.58**
2025	**41.98**	**23.92**	**0.63**	**0.58**
2026	**0.92**	**21.14**	**0.41**	**0.38**

	ROG	**Nox**	**PM10**	**PM2.5**
2020	**3.11**	**45.80**	**0.98**	**0.91**
2021	**5.61**	**70.69**	**0.90**	**0.83**
2022	**5.59**	**70.49**	**0.89**	**0.83**
2023	**91.37**	**81.46**	**1.45**	**1.33**
2024	**44.01**	**23.95**	**0.63**	**0.58**
2025	**43.84**	**23.92**	**0.63**	**0.58**
2026	**0.92**	**21.14**	**0.41**	**0.38**

Adjustments to reflect ARB's 2011 Inventory Model for In-Use Off-Road Equipment	ROG	Nox	PM10	PM2.5
OFFROAD2007 to 2011 EF and LF average adjustment factor (separate workbook) =	0.52	0.719	0.729	0.729

	ROG	Nox	PM10	PM2.5
For construction worker trips URBEMIS assumes 50% LDA and 50% LDT				
EMFAC2007 to EMFAC2011 Correction percentage for construction workers =	1.97	1.58	0.2	0.2
For Construction vendor trps URBEMIS assumes 100% HHD				
EMFAC2007 to EMFAC2011 Correction percentage for construction vendors =	1	1.24	0.28	0.28
(separate workbook)				

Percentage vendor trip/truck emissions (URBEMIS)

	ROG	Nox	PM10	PM2.5
2020	18%	27%	26%	24%
2021	59%	78%	65%	65%
2022	59%	78%	65%	65%
2023	5%	68%	52%	52%
2024	0.00	0.00	0.00	0.00
2025	0.00	0.00	0.00	0.00
2026	0.00	0.00	0.00	0.00

Percentage worker trip emissions (URBEMIS)

	ROG	Nox	PM10	PM2.5
2020	0.00	0.00	0.00	0.00
2021	25%	7%	23%	21%
2022	25%	7%	23%	21%
2023	2%	6%	19%	17%
2024	0.00	0.00	0.00	0.00
2025	0.00	0.00	0.00	0.00
2026	0.00	0.00	0.00	0.00

Percentage Offroad emissions (URBEMIS)

	ROG	Nox	PM10	PM2.5	Offgas % ROG
2020	82%	73%	74%	76%	0.00%
2021	16%	15%	12%	14%	0.00%
2022	16%	15%	12%	14%	0.00%
2023	3%	26%	29%	31%	90.00%
2024	100%	100%	100%	100%	0.00%
2025	100%	100%	100%	100%	0.00%
2026	100%	100%	100%	100%	0.00%

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Urbemis 2007 Version 9.2.4

Summary Report for Annual Emissions (Tons/Year)

File Name: C:\Documents and Settings\cls\Application Data\Urbemis\Version9a\Projects\Bribsane Construction DSP Phase 2.urb924

Project Name: Brisbane Baylands - DSP construction Phase 2

Project Location: San Mateo County

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

Off-Road Vehicle Emissions Based on: OFFROAD2007

CONSTRUCTION EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5	CO2
2020 TOTALS (tons/year unmitigated)	0.76	5.81	4.06	0.01	103.84	0.23	104.07	21.68	0.21	21.90	1,604.32
2020 TOTALS (tons/year mitigated)	0.76	4.29	4.06	0.01	103.84	0.10	103.94	21.68	0.09	21.78	1,604.32
Percent Reduction	0.00	26.11	0.00	0.00	0.00	56.26	0.13	0.00	56.28	0.55	0.00
2021 TOTALS (tons/year unmitigated)	1.60	9.84	32.88	0.12	0.55	0.55	1.10	0.19	0.48	0.68	13,120.56
2021 TOTALS (tons/year mitigated)	1.60	9.29	32.88	0.12	0.55	0.49	1.04	0.19	0.43	0.63	13,120.56
Percent Reduction	0.00	5.57	0.00	0.00	0.00	10.03	5.03	0.00	10.46	7.50	0.00
2022 TOTALS (tons/year unmitigated)	1.60	9.80	32.76	0.12	0.54	0.55	1.09	0.19	0.48	0.67	13,070.29
2022 TOTALS (tons/year mitigated)	1.60	9.26	32.76	0.12	0.54	0.49	1.04	0.19	0.43	0.62	13,070.29
Percent Reduction	0.00	5.57	0.00	0.00	0.00	10.03	5.03	0.00	10.46	7.50	0.00
2023 TOTALS (tons/year unmitigated)	24.91	11.20	34.17	0.12	0.55	0.66	1.20	0.19	0.58	0.77	13,311.55
2023 TOTALS (tons/year mitigated)	8.76	10.10	34.17	0.12	0.55	0.51	1.06	0.19	0.45	0.64	13,311.55
Percent Reduction	64.84	9.77	0.00	0.00	0.00	22.19	12.10	0.00	23.00	17.30	0.00
2024 TOTALS (tons/year unmitigated)	23.49	1.41	1.43	0.00	0.00	0.11	0.11	0.00	0.10	0.10	243.11
2024 TOTALS (tons/year mitigated)	7.24	0.85	1.43	0.00	0.00	0.02	0.02	0.00	0.02	0.02	243.11
Percent Reduction	69.16	39.25	0.00	0.00	0.00	83.62	81.67	0.00	83.72	82.95	0.00
2025 TOTALS (tons/year unmitigated)	23.40	1.40	1.42	0.00	0.00	0.11	0.11	0.00	0.10	0.10	242.19
2025 TOTALS (tons/year mitigated)	7.19	0.85	1.42	0.00	0.00	0.02	0.02	0.00	0.02	0.02	242.19
Percent Reduction	69.28	39.25	0.00	0.00	0.00	83.62	81.67	0.00	83.72	82.95	0.00
2026 TOTALS (tons/year unmitigated)	0.12	0.69	0.65	0.00	0.00	0.05	0.05	0.00	0.05	0.05	106.05
2026 TOTALS (tons/year mitigated)	0.12	0.42	0.65	0.00	0.00	0.01	0.01	0.00	0.01	0.01	106.05
Percent Reduction	0.00	39.51	0.00	0.00	0.00	84.26	83.29	0.00	84.30	83.92	0.00

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Summary Report for Annual Emissions (Tons/Year)

File Name: C:\Documents and Settings\cls\Application Data\Urbemis\Version9a\Projects\Bribsane Construction DSPE Phase 2.urb924

Project Name: Brisbane Baylands - DSPE construction Phase 2

Project Location: San Mateo County

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

Off-Road Vehicle Emissions Based on: OFFROAD2007

CONSTRUCTION EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5	CO2
2020 TOTALS (tons/year unmitigated)	1.04	7.77	4.92	0.01	253.16	0.30	253.46	52.87	0.28	53.14	1,992.10
2020 TOTALS (tons/year mitigated)	1.04	5.30	4.92	0.01	145.55	0.09	145.64	30.39	0.08	30.48	1,992.10
Percent Reduction	0.00	31.84	0.00	0.00	42.51	69.31	42.54	42.51	69.33	42.65	0.00
2021 TOTALS (tons/year unmitigated)	4.73	31.03	94.10	0.38	1.68	1.67	3.35	0.59	1.47	2.06	40,693.29
2021 TOTALS (tons/year mitigated)	4.73	30.48	94.10	0.38	1.68	1.61	3.29	0.59	1.42	2.01	40,693.29
Percent Reduction	0.00	1.77	0.00	0.00	0.00	3.31	1.65	0.00	3.45	2.46	0.00
2022 TOTALS (tons/year unmitigated)	4.71	30.91	93.74	0.38	1.68	1.66	3.34	0.59	1.46	2.05	40,537.38
2022 TOTALS (tons/year mitigated)	4.71	30.36	93.74	0.38	1.68	1.60	3.28	0.59	1.41	2.00	40,537.38
Percent Reduction	0.00	1.77	0.00	0.00	0.00	3.31	1.65	0.00	3.45	2.46	0.00
2023 TOTALS (tons/year unmitigated)	63.08	32.34	95.31	0.38	1.68	1.77	3.45	0.59	1.57	2.15	40,839.65
2023 TOTALS (tons/year mitigated)	22.41	31.25	95.31	0.38	1.68	1.62	3.31	0.59	1.43	2.02	40,839.65
Percent Reduction	64.47	3.38	0.00	0.00	0.00	8.23	4.22	0.00	8.55	6.22	0.00
2024 TOTALS (tons/year unmitigated)	58.81	1.44	1.59	0.00	0.01	0.11	0.12	0.00	0.10	0.10	304.60
2024 TOTALS (tons/year mitigated)	17.90	0.89	1.59	0.00	0.01	0.02	0.03	0.00	0.02	0.02	304.60
Percent Reduction	69.56	38.28	0.00	0.00	0.00	82.08	78.32	0.00	82.26	80.76	0.00
2025 TOTALS (tons/year unmitigated)	58.59	1.44	1.58	0.00	0.01	0.11	0.12	0.00	0.10	0.10	303.43
2025 TOTALS (tons/year mitigated)	17.77	0.89	1.58	0.00	0.01	0.02	0.03	0.00	0.02	0.02	303.43
Percent Reduction	69.68	38.28	0.00	0.00	0.00	82.08	78.32	0.00	82.26	80.76	0.00
2026 TOTALS (tons/year unmitigated)	0.15	0.70	0.65	0.00	0.00	0.05	0.05	0.00	0.05	0.05	115.59
2026 TOTALS (tons/year mitigated)	0.15	0.43	0.65	0.00	0.00	0.01	0.01	0.00	0.01	0.01	115.59
Percent Reduction	0.00	38.86	0.00	0.00	0.00	83.65	82.19	0.00	83.68	83.13	0.00

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Summary Report for Annual Emissions (Tons/Year)

File Name: C:\Documents and Settings\cls\Application Data\Urbemis\Version9a\Projects\Bribsane Construction CPP Phase 2.urb924

Project Name: Brisbane Baylands - CPP construction Phase 2

Project Location: San Mateo County

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

Off-Road Vehicle Emissions Based on: OFFROAD2007

CONSTRUCTION EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5	CO2
2020 TOTALS (tons/year unmitigated)	0.76	5.81	4.06	0.01	66.21	0.23	66.44	13.83	0.21	14.04	1,604.32
2020 TOTALS (tons/year mitigated)	0.76	4.12	4.06	0.01	39.82	0.08	39.91	8.32	0.08	8.39	1,604.32
Percent Reduction	0.00	29.09	0.00	0.00	39.85	64.79	39.94	39.85	64.81	40.23	0.00
2021 TOTALS (tons/year unmitigated)	1.41	9.30	25.34	0.10	0.44	0.49	0.92	0.15	0.43	0.58	10,840.45
2021 TOTALS (tons/year mitigated)	1.41	9.30	25.34	0.10	0.44	0.49	0.92	0.15	0.43	0.58	10,840.45
Percent Reduction	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2022 TOTALS (tons/year unmitigated)	1.40	9.27	25.24	0.10	0.44	0.49	0.92	0.15	0.43	0.58	10,798.92
2022 TOTALS (tons/year mitigated)	1.40	9.27	25.24	0.10	0.44	0.49	0.92	0.15	0.43	0.58	10,798.92
Percent Reduction	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2023 TOTALS (tons/year unmitigated)	15.88	10.65	26.62	0.10	0.44	0.59	1.03	0.15	0.53	0.68	11,024.80
2023 TOTALS (tons/year mitigated)	5.91	10.10	26.62	0.10	0.44	0.50	0.94	0.15	0.45	0.60	11,024.80
Percent Reduction	62.78	5.14	0.00	0.00	0.00	15.28	8.80	0.00	15.74	12.22	0.00
2024 TOTALS (tons/year unmitigated)	14.59	1.40	1.39	0.00	0.00	0.11	0.11	0.00	0.10	0.10	227.62
2024 TOTALS (tons/year mitigated)	4.56	0.85	1.39	0.00	0.00	0.02	0.02	0.00	0.02	0.02	227.62
Percent Reduction	68.76	39.51	0.00	0.00	0.00	84.02	82.56	0.00	84.09	83.52	0.00
2025 TOTALS (tons/year unmitigated)	14.53	1.39	1.38	0.00	0.00	0.11	0.11	0.00	0.10	0.10	226.75
2025 TOTALS (tons/year mitigated)	4.52	0.84	1.38	0.00	0.00	0.02	0.02	0.00	0.02	0.02	226.75
Percent Reduction	68.87	39.51	0.00	0.00	0.00	84.02	82.56	0.00	84.09	83.52	0.00
2026 TOTALS (tons/year unmitigated)	0.12	0.69	0.65	0.00	0.00	0.05	0.05	0.00	0.05	0.05	103.65
2026 TOTALS (tons/year mitigated)	0.12	0.41	0.65	0.00	0.00	0.01	0.01	0.00	0.01	0.01	103.65
Percent Reduction	0.00	39.67	0.00	0.00	0.00	84.42	83.57	0.00	84.45	84.13	0.00

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Urbemis 2007 Version 9.2.4

Summary Report for Annual Emissions (Tons/Year)

File Name: C:\Documents and Settings\cls\Application Data\Urbemis\Version9a\Projects\Bribsane Construction CPPREV Phase 2.urb924

Project Name: Brisbane Baylands - CPPREV construction Phase 2

Project Location: San Mateo County

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

Off-Road Vehicle Emissions Based on: OFFROAD2007

CONSTRUCTION EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5	CO2
2020 TOTALS (tons/year unmitigated)	0.76	5.81	4.06	0.01	68.98	0.23	69.21	14.40	0.21	14.62	1,604.32
2020 TOTALS (tons/year mitigated)	0.76	4.12	4.06	0.01	68.98	0.08	69.06	14.40	0.08	14.48	1,604.32
Percent Reduction	0.00	29.09	0.00	0.00	0.00	64.79	0.22	0.00	64.81	0.95	0.00
2021 TOTALS (tons/year unmitigated)	1.37	8.87	25.12	0.10	0.43	0.47	0.90	0.15	0.42	0.57	10,551.92
2021 TOTALS (tons/year mitigated)	1.37	8.32	25.12	0.10	0.43	0.42	0.84	0.15	0.37	0.52	10,551.92
Percent Reduction	0.00	6.18	0.00	0.00	0.00	11.71	6.14	0.00	12.16	8.95	0.00
2022 TOTALS (tons/year unmitigated)	1.36	8.84	25.03	0.10	0.43	0.47	0.89	0.15	0.42	0.56	10,511.49
2022 TOTALS (tons/year mitigated)	1.36	8.29	25.03	0.10	0.43	0.41	0.84	0.15	0.37	0.51	10,511.49
Percent Reduction	0.00	6.18	0.00	0.00	0.00	11.71	6.14	0.00	12.16	8.95	0.00
2023 TOTALS (tons/year unmitigated)	16.49	10.22	26.41	0.10	0.43	0.58	1.00	0.15	0.51	0.66	10,738.50
2023 TOTALS (tons/year mitigated)	6.06	9.13	26.41	0.10	0.43	0.43	0.86	0.15	0.38	0.53	10,738.50
Percent Reduction	63.23	10.70	0.00	0.00	0.00	25.24	14.49	0.00	26.02	20.16	0.00
2024 TOTALS (tons/year unmitigated)	15.24	1.40	1.39	0.00	0.00	0.11	0.11	0.00	0.10	0.10	228.76
2024 TOTALS (tons/year mitigated)	4.76	0.85	1.39	0.00	0.00	0.02	0.02	0.00	0.02	0.02	228.76
Percent Reduction	68.80	39.49	0.00	0.00	0.00	83.99	82.49	0.00	84.06	83.48	0.00
2025 TOTALS (tons/year unmitigated)	15.18	1.39	1.38	0.00	0.00	0.11	0.11	0.00	0.10	0.10	227.89
2025 TOTALS (tons/year mitigated)	4.72	0.84	1.38	0.00	0.00	0.02	0.02	0.00	0.02	0.02	227.89
Percent Reduction	68.92	39.49	0.00	0.00	0.00	83.99	82.49	0.00	84.06	83.48	0.00
2026 TOTALS (tons/year unmitigated)	0.12	0.69	0.65	0.00	0.00	0.05	0.05	0.00	0.05	0.05	103.82
2026 TOTALS (tons/year mitigated)	0.12	0.41	0.65	0.00	0.00	0.01	0.01	0.00	0.01	0.01	103.82
Percent Reduction	0.00	39.66	0.00	0.00	0.00	84.41	83.55	0.00	84.44	84.11	0.00

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Urbemis 2007 Version 9.2.4

Summary Report for Annual Emissions (Tons/Year)

File Name: C:\Documents and Settings\cls\Application Data\Urbemis\Version9a\Projects\Brisbane RD Alt 052312.urb924

Project Name: Brisbane Baylands Reduced Density Alternative 052312

Project Location: San Mateo County

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

Off-Road Vehicle Emissions Based on: OFFROAD2007

CONSTRUCTION EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5	CO2
2014 TOTALS (tons/year unmitigated)	1.00	8.00	4.63	0.00	87.82	0.36	88.19	18.34	0.33	18.67	979.88
2014 TOTALS (tons/year mitigated)	1.00	4.80	4.63	0.00	49.67	0.05	49.72	10.37	0.05	10.42	979.88
Percent Reduction	0.00	39.94	0.00	0.00	43.45	84.84	43.62	43.45	84.85	44.18	0.00
2015 TOTALS (tons/year unmitigated)	2.41	16.85	46.07	0.09	0.40	0.74	1.14	0.14	0.66	0.81	9,640.27
2015 TOTALS (tons/year mitigated)	2.41	16.00	46.07	0.09	0.40	0.63	1.03	0.14	0.56	0.70	9,640.27
Percent Reduction	0.00	5.01	0.00	0.00	0.00	15.39	9.98	0.00	15.73	12.99	0.00
2016 TOTALS (tons/year unmitigated)	2.22	15.16	43.20	0.09	0.40	0.67	1.07	0.14	0.60	0.74	9,640.56
2016 TOTALS (tons/year mitigated)	2.22	14.38	43.20	0.09	0.40	0.57	0.97	0.14	0.51	0.65	9,640.56
Percent Reduction	0.00	5.11	0.00	0.00	0.00	14.47	9.07	0.00	14.83	12.03	0.00
2017 TOTALS (tons/year unmitigated)	19.91	15.33	41.86	0.09	0.40	0.76	1.16	0.14	0.68	0.82	9,839.62
2017 TOTALS (tons/year mitigated)	7.62	13.96	41.86	0.09	0.40	0.55	0.96	0.14	0.49	0.64	9,839.62
Percent Reduction	61.73	8.98	0.00	0.00	0.00	26.68	17.44	0.00	27.28	22.60	0.00
2018 TOTALS (tons/year unmitigated)	17.92	1.62	1.51	0.00	0.00	0.13	0.13	0.00	0.12	0.12	236.39
2018 TOTALS (tons/year mitigated)	5.58	0.99	1.51	0.00	0.00	0.02	0.02	0.00	0.02	0.02	236.39
Percent Reduction	68.84	38.83	0.00	0.00	0.00	83.54	82.06	0.00	83.61	83.03	0.00
2019 TOTALS (tons/year unmitigated)	17.76	0.75	0.79	0.00	0.00	0.06	0.06	0.00	0.05	0.05	127.47
2019 TOTALS (tons/year mitigated)	5.43	0.46	0.79	0.00	0.00	0.01	0.01	0.00	0.01	0.01	127.47
Percent Reduction	69.46	38.73	0.00	0.00	0.00	83.10	80.78	0.00	83.22	82.30	0.00

AREA SOURCE EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10	PM2.5	CO2
TOTALS (tons/year, unmitigated)	5.69	4.56	4.93	0.00	0.01	0.01	5,460.39

OPERATIONAL (VEHICLE) EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10	PM2.5	CO2
TOTALS (tons/year, unmitigated)	13.51	9.86	138.51	0.44	82.71	15.61	43,348.88

SUM OF AREA SOURCE AND OPERATIONAL EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10	PM2.5	CO2
TOTALS (tons/year, unmitigated)	19.20	14.42	143.44	0.44	82.72	15.62	48,809.27

This Spreadsheet adds the emissions from soil transport to thoise calculated by URBEMIS.
URBEMIS calculations included export of 22000 cy of soil associated with the RAP
Assume transport of soil to rail yard occurs in Phase 1 and transport of soil offsite occurs in Phase 2

Reduced Density Alternative - No Mitigation

2014	5.47	43.81	1.98	1.82
2015	13.21	92.32	4.05	3.64
2016	12.17	83.05	3.68	3.31
2017	109.08	84.02	4.14	3.73
2018	98.19	8.86	0.70	0.65
2019	97.32	4.11	0.32	0.29
2020	0.00	0.00	0.00	0.00
BAAQMD Thr	54	54	82	54
Exceeds Thre	Yes	Yes	No	No

	ROG	Nox	PM10	PM2.5
2014	6.05	62.25	2.18	2.00
2015	13.79	**110.76**	4.25	3.83
2016	12.75	**101.49**	3.88	3.49
2017	**109.66**	**102.46**	4.34	3.91
2018	**98.76**	27.29	0.90	0.83
2019	**97.90**	22.55	0.52	0.47
2020	0.58	18.44	0.20	0.18

This Spreadsheet adds the emissions from soil transport to thoise calculated by URBEMIS.
URBEMIS calculations included export of 22000 cy of soil associated with the RAP
Assume transport of soil to rail yard occurs in Phase 1 and transport of soil offsite occurs in Phase 2

Reduced Density Alternative - Mitigated

2014	5.47	26.31	0.30	0.28
2015	13.21	87.69	3.43	3.07
2016	12.17	78.81	3.15	2.82
2017	41.75	76.48	3.04	2.71
2018	30.59	5.42	0.12	0.11
2019	29.73	2.52	0.05	0.05
BAAQMD Thr	54	54	82	54
Exceeds Thre	Yes	Yes	No	No

	ROG	Nox	PM10	PM2.5
2014	6.05	44.75	0.50	0.46
2015	13.79	**106.13**	3.63	3.25
2016	12.75	**97.25**	3.35	3.00
2017	**42.33**	**94.91**	3.24	2.90
2018	**31.17**	23.85	0.32	0.29
2019	**30.30**	20.96	0.25	0.23

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Urbemis 2007 Version 9.2.4

Summary Report for Annual Emissions (Tons/Year)

File Name: C:\Documents and Settings\cls\Application Data\Urbemis\Version9a\Projects\Brisbane REG Alt.urb924

Project Name: Brisbane Baylands Renewable Energy Generation Alternative

Project Location: San Mateo County

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

Off-Road Vehicle Emissions Based on: OFFROAD2007

CONSTRUCTION EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5	CO2
2014 TOTALS (tons/year unmitigated)	1.00	8.00	4.63	0.00	94.01	0.36	94.37	19.63	0.33	19.96	979.88
2014 TOTALS (tons/year mitigated)	1.00	6.47	4.63	0.00	53.16	0.21	53.37	11.10	0.19	11.29	979.88
Percent Reduction	0.00	19.07	0.00	0.00	43.45	42.54	43.45	43.45	42.55	43.43	0.00
2015 TOTALS (tons/year unmitigated)	3.42	27.13	60.01	0.13	0.57	1.13	1.70	0.20	1.02	1.22	13,938.11
2015 TOTALS (tons/year mitigated)	3.42	26.29	60.01	0.13	0.57	1.02	1.58	0.20	0.92	1.11	13,938.11
Percent Reduction	0.00	3.11	0.00	0.00	0.00	10.05	6.70	0.00	10.24	8.58	0.00
2016 TOTALS (tons/year unmitigated)	3.15	24.36	56.29	0.13	0.57	1.03	1.59	0.20	0.93	1.12	13,938.37
2016 TOTALS (tons/year mitigated)	3.15	23.58	56.29	0.13	0.57	0.93	1.50	0.20	0.84	1.03	13,938.37
Percent Reduction	0.00	3.18	0.00	0.00	0.00	9.46	6.10	0.00	9.66	7.96	0.00
2017 TOTALS (tons/year unmitigated)	22.01	23.55	54.11	0.13	0.57	1.08	1.65	0.20	0.97	1.17	14,123.46
2017 TOTALS (tons/year mitigated)	8.86	22.17	54.11	0.13	0.57	0.88	1.45	0.20	0.79	0.99	14,123.46
Percent Reduction	59.76	5.85	0.00	0.00	0.00	18.67	12.25	0.00	19.06	15.84	0.00
2018 TOTALS (tons/year unmitigated)	19.16	1.62	1.52	0.00	0.00	0.13	0.13	0.00	0.12	0.12	238.82
2018 TOTALS (tons/year mitigated)	5.96	0.99	1.52	0.00	0.00	0.02	0.02	0.00	0.02	0.02	238.82
Percent Reduction	68.91	38.76	0.00	0.00	0.00	83.46	81.91	0.00	83.53	82.93	0.00
2019 TOTALS (tons/year unmitigated)	19.00	0.75	0.80	0.00	0.00	0.06	0.06	0.00	0.05	0.05	129.42
2019 TOTALS (tons/year mitigated)	5.80	0.46	0.80	0.00	0.00	0.01	0.01	0.00	0.01	0.01	129.42
Percent Reduction	69.49	38.65	0.00	0.00	0.00	82.99	80.55	0.00	83.11	82.15	0.00

AREA SOURCE EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10	PM2.5	CO2
TOTALS (tons/year, unmitigated)	5.78	1.38	1.71	0.00	0.00	0.00	1,643.66

OPERATIONAL (VEHICLE) EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10	PM2.5	CO2
TOTALS (tons/year, unmitigated)	3.43	2.40	33.79	0.10	20.15	3.80	10,568.54

SUM OF AREA SOURCE AND OPERATIONAL EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10	PM2.5	CO2
TOTALS (tons/year, unmitigated)	9.21	3.78	35.50	0.10	20.15	3.80	12,212.20

This Spreadsheet adds the emissions from soil transport to thoise calculated by URBEMIS.
URBEMIS calculations included export of 22000 cy of soil associated with the RAP
Assume transport of soil to rail yard occurs in Phase 1 and transport of soil offsite occurs in Phase 2
Adjustments made to reflect ARB's 2011 Inventory Model for In-Use Off-Road Equipment

Renewable Energy Generation Alternative - No Mitigation

2014	5.47	43.81	1.98	1.82
2015	18.72	148.68	6.20	5.60
2016	17.28	133.46	5.63	5.08
2017	120.61	129.05	5.92	5.34
2018	105.00	8.87	0.70	0.65
2019	104.13	4.12	0.32	0.29
2020	0.00	0.00	0.00	0.00
BAAQMD Thr	54	54	82	54
Exceeds Thre	Yes	Yes	No	No

	ROG	Nox	PM10	PM2.5
2014	3.47	50.06	2.03	1.87
2015	19.30	**167.11**	6.40	5.78
2016	17.86	**151.89**	5.83	5.26
2017	**121.19**	**147.49**	5.77	5.20
2018	**105.58**	24.89	0.71	0.65
2019	**104.70**	21.44	0.43	0.40
2020	0.58	18.44	0.20	0.18

Adjustments to reflect ARB's 2011 Inventory Model for In-Use Off-Road Equipment	ROG	Nox	PM10	PM2.5
OFFROAD2007 to 2011 EF and LF average adjustment factor (separate workbook) =	0.52	0.719	0.729	0.729

These adjustments only applied to Year 2014 for ROG and year 2014, 2018 and 2019 for Nox when off-road diesel contribute more than 15 percent of emisions
These adjustments only applied to Year 2014 2017, 2018 and 2019 for PM when off-road diesel contribute more than 15 percent of emisions

This Spreadsheet adds the emissions from soil transport to thoise calculated by URBEMIS.
URBEMIS calculations included export of 22000 cy of soil associated with the RAP
Assume transport of soil to rail yard occurs in Phase 1 and transport of soil offsite occurs in Phase 2

Renewable Energy Generation Alternative - Mitigated

2014	5.47	35.46	1.14	1.04
2015	18.72	144.05	5.58	5.03
2016	17.28	129.21	5.10	4.59
2017	48.53	121.50	4.82	4.32
2018	32.65	5.43	0.12	0.11
2019	31.77	2.53	0.05	0.05
BAAQMD Thr	54	54	82	54
Exceeds Thre	Yes	Yes	No	No

	ROG	Nox	PM10	PM2.5
2014	3.47	44.03	1.25	1.15
2015	19.30	**162.49**	5.78	5.21
2016	17.86	**147.65**	5.30	4.77
2017	**49.11**	**139.94**	4.73	4.25
2018	**33.22**	22.39	0.29	0.26
2019	**32.35**	20.28	0.24	0.22
2020	0.58	18.44	0.20	0.18

Adjustments to reflect ARB's 2011 Inventory Model for In-Use Off-Road Equipment	ROG	Nox	PM10	PM2.5
OFFROAD2007 to 2011 EF and LF average adjustment factor (separate workbook) =	0.52	0.719	0.729	0.729

These adjustments only applied to Year 2014 for ROG and year 2014, 2018 and 2019 for Nox when off-road diesel contribute more than 15 percent of emisions
These adjustments only applied to Year 2014 2017, 2018 and 2019 for PM when off-road diesel contribute more than 15 percent of emisions

This Spreadsheet adds the emissions from soil transport to thoise calculated by URBEMIS.
URBEMIS calculations included export of 22000 cy of soil associated with the RAP
Assume transport of soil to rail yard occurs in Phase 1 and transport of soil offsite occurs in Phase 2

This sheet for Phase 2 only
This Sheet Mitigated

Mitigated Phase 2 Construction Emissions from URBEMIS2007

Developer Sponsored Project Construction				
2020	4.18	23.52	0.56	0.51
2021	8.78	50.91	2.71	2.38
2022	8.75	50.72	2.70	2.37
2023	47.99	**55.36**	2.80	2.46
2024	39.69	4.68	0.10	0.09
2025	39.40	4.66	0.10	0.09
2026	0.68	2.28	0.05	0.04
BAAQMD Thr	54	54	82	54
Exceeds Thre	Yes	Yes	No	No

Developer Sponsored Project Entertainment variant Construction				
2020	5.69	29.03	0.50	0.46
2021	25.92	167.02	8.82	7.78
2022	25.82	166.38	8.79	7.75
2023	122.80	171.22	8.90	7.85
2024	98.09	4.88	0.11	0.10
2025	97.35	4.86	0.11	0.10
2026	0.80	2.34	0.05	0.04
BAAQMD Thr	54	54	82	54
Exceeds Thre	Yes	Yes	No	No

Community Preferred Plan Construction				
2020	4.18	22.57	0.45	0.41
2021	7.72	50.96	2.67	2.37
2022	7.69	50.77	2.66	2.36
2023	32.39	**55.37**	2.75	2.45
2024	24.97	4.63	0.10	0.09
2025	24.79	4.61	0.09	0.09
2026	0.65	2.26	0.05	0.04
BAAQMD Thr	54	54	82	54
Exceeds Thre	Yes	Yes	No	No

Community Preferred Plan Recology variant Construction				
2020	4.18	22.57	0.45	0.41
2021	7.48	45.61	2.28	2.01
2022	7.45	45.43	2.27	2.00
2023	33.22	50.03	2.36	2.09
2024	26.06	4.64	0.10	0.09
2025	25.86	4.62	0.10	0.09
2026	0.65	2.27	0.05	0.04
BAAQMD Thr	54	54	82	54
Exceeds Thre	Yes	Yes	No	No

Emissions with Soil Tranport

	ROG	Nox	PM10	PM2.5
2020	4.75	41.96	0.76	0.69
2021	9.36	**69.35**	2.91	2.56
2022	9.32	**69.15**	2.90	2.55
2023	**48.57**	**73.80**	3.00	2.64
2024	**40.27**	23.12	0.30	0.27
2025	**39.97**	23.10	0.30	0.27
2026	1.26	20.72	0.25	0.23

	ROG	Nox	PM10	PM2.5
2020	6.27	47.47	0.70	0.65
2021	26.49	185.46	9.02	7.96
2022	26.39	184.82	8.99	7.93
2023	123.37	189.66	9.10	8.03
2024	98.67	23.31	0.31	0.28
2025	97.93	23.30	0.31	0.28
2026	1.38	20.78	0.25	0.23

	ROG	Nox	PM10	PM2.5
2020	4.75	41.01	0.65	0.60
2021	8.30	**69.40**	2.87	2.55
2022	8.27	**69.21**	2.86	2.54
2023	**32.96**	**73.80**	2.95	2.63
2024	**25.55**	23.07	0.30	0.27
2025	**25.36**	23.05	0.30	0.27
2026	1.23	20.70	0.25	0.23

	ROG	Nox	PM10	PM2.5
2020	4.75	41.01	0.65	0.60
2021	8.06	**64.04**	2.48	2.19
2022	8.03	**63.87**	2.47	2.18
2023	**33.79**	**68.47**	2.56	2.27
2024	**26.63**	23.07	0.30	0.27
2025	**26.44**	23.06	0.30	0.27
2026	1.23	20.70	0.25	0.23

Revised Phase 2 emissions with OFFROAD and EMFAC2011 corrections

	ROG	Nox	PM10	PM2.5
2020	**3.11**	**38.66**	**0.54**	**0.50**
2021	**10.81**	**78.80**	**1.06**	**0.96**
2022	**10.77**	**78.57**	**1.05**	**0.96**
2023	**48.81**	**80.72**	**1.31**	**1.18**
2024	**21.22**	**21.80**	**0.27**	**0.25**
2025	**21.06**	**21.79**	**0.27**	**0.25**
2026	**0.93**	**20.08**	**0.23**	**0.21**

	ROG	Nox	PM10	PM2.5
2020	**4.03**	**43.40**	**0.51**	**0.47**
2021	**18.02**	**197.99**	**2.58**	**2.39**
2022	**17.96**	**197.30**	**2.57**	**2.39**
2023	**123.99**	**211.05**	**3.71**	**3.37**
2024	**51.58**	**21.94**	**0.28**	**0.26**
2025	**51.20**	**21.93**	**0.28**	**0.26**
2026	**0.99**	**20.12**	**0.24**	**0.22**

	ROG	Nox	PM10	PM2.5
2020	**3.11**	**37.84**	**0.47**	**0.44**
2021	**5.78**	**73.23**	**0.92**	**0.86**
2022	**5.76**	**73.02**	**0.92**	**0.85**
2023	**33.12**	**80.72**	**1.29**	**1.18**
2024	**13.56**	**21.77**	**0.27**	**0.25**
2025	**13.47**	**21.76**	**0.27**	**0.25**
2026	**0.92**	**20.07**	**0.23**	**0.21**

	ROG	Nox	PM10	PM2.5
2020	**3.11**	**37.84**	**0.47**	**0.44**
2021	**5.61**	**67.47**	**0.81**	**0.75**
2022	**5.59**	**67.28**	**0.81**	**0.75**
2023	**33.96**	**74.72**	**1.13**	**1.03**
2024	**14.13**	**21.77**	**0.27**	**0.25**
2025	**14.03**	**21.76**	**0.27**	**0.25**
2026	**0.92**	**20.07**	**0.23**	**0.21**

Adjustments to reflect ARB's 2011 Inventory Model for In-Use Off-Road Equipment	ROG	Nox	PM10	PM2.5
OFFROAD2007 to 2011 EF and LF average adjustment factor (separate workbook) =	0.52	0.719	0.729	0.729

	ROG	Nox	PM10	PM2.5
For construction worker trips URBEMIS assumes 50% LDA and 50% LDT				
EMFAC2007 to EMFAC2011 Correction percentage for construction workers =	1.97	1.58	0.2	0.2
For Construction vendor trps URBEMIS assumes 100% HHD				
EMFAC2007 to EMFAC2011 Correction percentage for construction vendors =	1	1.24	0.28	0.28
(separate workbook)				

Percentage vendor trip/truck emissions (URBEMIS)

	ROG	Nox	PM10	PM2.5
2020	18%	27%	26%	24%
2021	59%	78%	65%	65%
2022	59%	78%	65%	65%
2023	5%	68%	52%	52%
2024	0.00	0.00	0.00	0.00
2025	0.00	0.00	0.00	0.00
2026	0.00	0.00	0.00	0.00

Percentage worker trip emissions (URBEMIS)

	ROG	Nox	PM10	PM2.5
2020	0.00	0.00	0.00	0.00
2021	25%	7%	23%	21%
2022	25%	7%	23%	21%
2023	2%	6%	19%	17%
2024	0.00	0.00	0.00	0.00
2025	0.00	0.00	0.00	0.00
2026	0.00	0.00	0.00	0.00

Percentage Offroad emissions (URBEMIS)

	ROG	Nox	PM10	PM2.5	Offgas % ROG
2020	82%	73%	74%	76%	0.00%
2021	16%	15%	12%	14%	0.00%
2022	16%	15%	12%	14%	0.00%
2023	3%	26%	29%	31%	90.00%
2024	100%	100%	100%	100%	0.00%
2025	100%	100%	100%	100%	0.00%
2026	100%	100%	100%	100%	0.00%

Railyard Transport Trips

Truck Trips = 173400 (Round Trips) Page 17 of Infrastructure plan

365 workdays/year
Construction Period = 5 Years
95.0137 round trips per day (assuming 10 hour work day = 15 truck loads per hour or a truck loaded every 4 minutes)
190.0274 one way truck trips/day
69360 oneway trips/yr
Trip Length = 1.25 miles

Mileage travelled in SFBAAB: 86700 miles/year

Truck percentage on 101 ay 3rd Street 0.046 or less per Caltrans 2007
Average vehicle weight for entrained road dust calc = 3.288

EMFAC2011 emission factors for HDD trucks:	ROG	NOx	PM10	CO	PM2.5		CO2	CH4	N2O	
Assumptions:	0.295	10.09	0.141	1.42	0.13	(gm/mile)	1837	0.0051	0.0048	Emisssion factors for CH4 andNO2 from CCAR Protocol Table C4
30 mph ave										
Analysis Year 2014										
Roadway Fugitive Dust Factor			0.001143	(Lb/VMT)						
Fugitive road dust =			0.27	Lb/day						
Emissions =	26	875	12	123	11.3	(kg/yr)	159268	0	0	kg/yr
	56	1925	27	271	25	(lb/year)				
	0.15	**5.27**	**0.07**	**0.74**	**0.07**	**Pounds/day**				
	0.03	0.96	0.01	0.14	0.012398	Tons/Year	175.19	0.00	0.00	ton/yr
							158.90	0.00	0.00	Metric tons/yr
BAAQMD Threshold	54	54	82	550	54	**Pounds/day**				
						GWP =	1	21	310	(GWP from IPCC 2nd Assessment Report per CCAR 2009)
						eCO2 =	158.9016	0.009264	0.128713	Metric tons/yr
						eCO2 =	**159.0396**			**159 Metric tons/yr**

EMFAC 2011
2015 Estimated Annual Emission Rates
EMFAC 2011 Vehicle Categories
San Francisco COUNTY
San Francisco Bay Area AIR BASIN
Bay Area AQMD

Area	CalYr	Season	Veh	Fuel	MdlYr	Speed (Miles/hr)	Pop (Vehicles)	VMT (Miles/day	Trips (Trips/day)	ROG_RUNE (gms/mile)	ROG_IDLEX (gms/vehic	ROG_STREX (gms/vehic
San Francis	2015	Annual	T7 single cc	DSL	AllMYr	30	0	112.3334	0	0.295245	0	0

ROG_DIUR	ROG_HTSK	ROG_RUNL	ROG_RESTI	TOG_RUNE	TOG_IDLEX	TOG_STRE	TOG_DIURI	TOG_HTSK	TOG_RUNL	TOG_RESTI	CO_RUNEX	CO_IDLEX
(gms/vehic	(gms/vehic	(gms/mile)	(gms/vehic	(gms/mile)	(gms/vehic	(gms/vehic	(gms/vehic	(gms/vehic	(gms/mile)	(gms/vehic	(gms/mile)	(gms/vehic
0	0	0	0	0.336114	0	0	0	0	0	0	1.422896	0

CO_STREX	NOX_RUNE	NOX_IDLEX	NOX_STRE	CO2_RUNE	CO2_IDLEX	CO2_STRE	CO2_RUNE	CO2_IDLEX	CO2_STRE	PM10_RUN	PM10_IDLE	PM10_STR
(gms/vehic	(gms/mile)	(gms/vehic	(gms/vehic	(gms/mile)	(gms/vehic	(gms/vehic	(gms/mile)	(gms/vehic	(gms/vehic	(gms/mile)	(gms/vehic	(gms/vehic
0	10.08771	0	0	1884.519	0	0	1837.406	0	0	0.141378	0	0

PM10_PM	PM10_PMI	PM2_5_RU	PM2_5_IDI	PM2_5_STI	PM2_5_PM	PM2_5_PM	SOX_RUNE	SOX_IDLEX	SOX_STREX
(gms/mile)	(gms/mile)	(gms/mile)	(gms/vehic	(gms/vehic	(gms/mile)	(gms/mile)	(gms/mile)	(gms/vehic	(gms/vehicle/day)
0	0	0.130068	0	0	0	0	0	0	0

Annual Average Daily Phase 1 construction from Urbemis2007 (lb/dy)

	ROG	Nox	PM10	PM2.5
Community Preferred Plan (and Recology variant)				
2014	6.45	**59.93**	2.51	2.31
2015	8.17	48.28	2.32	2.08
2016	7.51	43.63	2.10	1.88
2017	**80.80**	48.70	2.69	2.42
2018	**74.11**	8.07	0.71	0.65
2019	4.08	4.08	0.32	0.29
BAAQMD Thr	54	54	82	54
Exceeds Thre	Yes	Yes	No	No
Developer Sponsored Project (and Entertainment variant)				
2014	5.67	52.21	2.22	2.04
2015	12.51	**77.42**	3.54	3.17
2016	11.51	**69.79**	3.23	2.89
2017	**131.85**	**72.11**	3.74	3.35
2018	**121.66**	8.77	0.70	0.64
2019	**120.84**	4.08	0.32	0.29

Revised Phase 1 emissions with tranport to railyard

	ROG	Nox	PM10	PM2.5
2014	6.60	**65.21**	2.58	2.38
2015	8.32	53.56	2.39	2.15
2016	7.67	48.90	2.18	1.95
2017	**80.95**	**53.98**	2.77	2.49
2018	**74.27**	13.34	0.78	0.71
2019	4.24	9.36	0.39	0.36
2014	5.83	**57.49**	2.29	2.11
2015	12.67	**82.69**	3.61	3.24
2016	11.67	**75.06**	3.30	2.95
2017	**132.01**	**77.38**	3.82	3.42
2018	**121.82**	14.04	0.77	0.71
2019	**121.00**	9.35	0.39	0.36

Revised Phase 1 emissions with OFFROAD and EMFAC2011 corrections

	ROG	**Nox**	**PM10**	**PM2.5**
2014	**4.74**	**53.92**	**2.09**	**1.91**
2015	**11.07**	**61.41**	**1.01**	**0.92**
2016	**10.04**	**55.45**	**0.90**	**0.85**
2017	**82.54**	**57.76**	**1.39**	**1.26**
2018	**73.56**	**12.49**	**0.59**	**0.54**
2019	**4.24**	**8.24**	**0.30**	**0.28**
2014	**4.19**	**47.66**	**1.86**	**1.70**
2015	**16.87**	**95.28**	**1.50**	**1.36**
2016	**15.31**	**85.54**	**1.34**	**1.27**
2017	**134.59**	**62.76**	**0.56**	**0.49**
2018	**120.65**	**13.11**	**0.58**	**0.54**
2019	**121.00**	**8.24**	**0.30**	**0.28**

Adjustments to reflect ARB's 2011 Inventory Model for In-Use Off-Road Equipment	ROG	Nox	PM10	PM2.5
OFFROAD2007 to 2011 EF and LF average adjustment factor (separate workbook) =	0.52	0.719	0.729	0.729

For construction worker trips URBEMIS assumes 50% LDA and 50% LDT	ROG	Nox	PM10	PM2.5
EMFAC2007 to EMFAC2011 Correction percentage for construction workers =	1.97	1.58	0.2	0.2
For Construction vendor trps URBEMIS assumes 100% HHD				
EMFAC2007 to EMFAC2011 Correction percentage for construction vendors =	1	1.24	0.28	0.28
(separate workbook)				

Percentage vendor trip emissions (URBEMIS)

	ROG	Nox	PM10	PM2.5
2014	0	0	0	0
2015	0.31	0.62	0.50	0.50
2016	0.31	0.61	0.50	0.50
2017	0.03	0.49	0.35	0.34
2018	0.00	0.00	0.00	0.00
2019	0.00	0.00	0.00	0.00

Percentage worker trip emissions (URBEMIS)

	ROG	Nox	PM10	PM2.5
2014	0.00	0.00	0.00	0.00
2015	0.46	0.14	0.19	0.18
2016	0.45	0.14	0.21	0.21
2017	0.04	0.12	0.16	0.16
2018	0.00	0.11	0.00	0.00
2019	0.00	0.00	0.00	0.00

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Urbemis 2007 Version 9.2.4

Summary Report for Annual Emissions (Tons/Year)

File Name: C:\Documents and Settings\cls\Application Data\Urbemis\Version9a\Projects\Bribsane Construction CPP Phase 1.urb924

Project Name: Brisbane Baylands - CPP construction Phase 1

Project Location: San Mateo County

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

Off-Road Vehicle Emissions Based on: OFFROAD2007

CONSTRUCTION EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5	CO2
2014 TOTALS (tons/year unmitigated)	1.18	10.94	5.51	0.01	61.89	0.46	62.35	12.92	0.42	13.35	1,756.46
2014 TOTALS (tons/year mitigated)	1.18	7.99	5.51	0.01	61.78	0.18	61.95	12.90	0.16	13.06	1,756.46
Percent Reduction	0.00	26.94	0.00	0.00	0.18	61.65	0.64	0.18	61.65	2.13	0.00
2015 TOTALS (tons/year unmitigated)	1.49	8.81	29.91	0.05	0.24	0.42	0.66	0.08	0.38	0.46	5,595.47
2015 TOTALS (tons/year mitigated)	1.49	7.97	29.91	0.05	0.24	0.31	0.54	0.08	0.27	0.36	5,595.47
Percent Reduction	0.00	9.58	0.00	0.00	0.00	26.89	17.28	0.00	27.56	22.60	0.00
2016 TOTALS (tons/year unmitigated)	1.37	7.96	28.06	0.05	0.24	0.38	0.62	0.08	0.34	0.43	5,595.71
2016 TOTALS (tons/year mitigated)	1.37	7.19	28.06	0.05	0.24	0.29	0.52	0.08	0.25	0.34	5,595.71
Percent Reduction	0.00	9.73	0.00	0.00	0.00	25.35	15.72	0.00	26.06	20.97	0.00
2017 TOTALS (tons/year unmitigated)	14.75	8.89	27.69	0.05	0.24	0.49	0.73	0.08	0.44	0.53	5,801.55
2017 TOTALS (tons/year mitigated)	5.51	7.51	27.69	0.05	0.24	0.29	0.53	0.08	0.26	0.34	5,801.55
Percent Reduction	62.60	15.49	0.00	0.00	0.00	41.06	27.73	0.00	41.99	35.31	0.00
2018 TOTALS (tons/year unmitigated)	13.53	1.61	1.47	0.00	0.00	0.13	0.13	0.00	0.12	0.12	227.79
2018 TOTALS (tons/year mitigated)	4.26	0.98	1.47	0.00	0.00	0.02	0.02	0.00	0.02	0.02	227.79
Percent Reduction	68.51	39.09	0.00	0.00	0.00	83.83	82.57	0.00	83.89	83.40	0.00
2019 TOTALS (tons/year unmitigated)	13.37	0.75	0.76	0.00	0.00	0.06	0.06	0.00	0.05	0.05	120.57
2019 TOTALS (tons/year mitigated)	4.11	0.45	0.76	0.00	0.00	0.01	0.01	0.00	0.01	0.01	120.57
Percent Reduction	69.30	39.01	0.00	0.00	0.00	83.49	81.58	0.00	83.59	82.83	0.00

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Urbemis 2007 Version 9.2.4

Summary Report for Annual Emissions (Tons/Year)

File Name: C:\Documents and Settings\cls\Application Data\Urbemis\Version9a\Projects\Bribsane Construction DSP Phase 1.urb924

Project Name: Brisbane Baylands - DSP construction Phase 1

Project Location: San Mateo County

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

Off-Road Vehicle Emissions Based on: OFFROAD2007

CONSTRUCTION EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5	CO2
2014 TOTALS (tons/year unmitigated)	1.04	9.53	4.94	0.01	43.52	0.41	43.93	9.09	0.37	9.46	1,519.00
2014 TOTALS (tons/year mitigated)	1.04	6.93	4.94	0.01	43.41	0.15	43.56	9.06	0.14	9.20	1,519.00
Percent Reduction	0.00	27.25	0.00	0.00	0.26	62.55	0.84	0.26	62.56	2.72	0.00
2015 TOTALS (tons/year unmitigated)	2.28	14.13	47.93	0.09	0.39	0.65	1.04	0.14	0.58	0.72	9,235.75
2015 TOTALS (tons/year mitigated)	2.28	13.29	47.93	0.09	0.39	0.53	0.92	0.14	0.47	0.61	9,235.75
Percent Reduction	0.00	5.98	0.00	0.00	0.00	17.62	10.95	0.00	18.10	14.59	0.00
2016 TOTALS (tons/year unmitigated)	2.10	12.74	44.92	0.09	0.39	0.59	0.98	0.14	0.53	0.67	9,236.12
2016 TOTALS (tons/year mitigated)	2.10	11.96	44.92	0.09	0.39	0.49	0.89	0.14	0.44	0.58	9,236.12
Percent Reduction	0.00	6.08	0.00	0.00	0.00	16.50	9.90	0.00	16.99	13.45	0.00
2017 TOTALS (tons/year unmitigated)	24.06	13.16	43.46	0.09	0.39	0.68	1.08	0.14	0.61	0.75	9,435.22
2017 TOTALS (tons/year mitigated)	8.78	11.78	43.46	0.09	0.39	0.48	0.87	0.14	0.43	0.57	9,435.22
Percent Reduction	63.53	10.46	0.00	0.00	0.00	29.55	18.74	0.00	30.34	24.71	0.00
2018 TOTALS (tons/year unmitigated)	22.20	1.60	1.53	0.00	0.00	0.13	0.13	0.00	0.12	0.12	234.82
2018 TOTALS (tons/year mitigated)	6.86	0.97	1.53	0.00	0.00	0.02	0.02	0.00	0.02	0.02	234.82
Percent Reduction	69.12	39.23	0.00	0.00	0.00	83.86	82.36	0.00	83.94	83.35	0.00
2019 TOTALS (tons/year unmitigated)	22.05	0.74	0.81	0.00	0.00	0.06	0.06	0.00	0.05	0.05	129.28
2019 TOTALS (tons/year mitigated)	6.71	0.45	0.81	0.00	0.00	0.01	0.01	0.00	0.01	0.01	129.28
Percent Reduction	69.58	39.07	0.00	0.00	0.00	83.32	80.79	0.00	83.45	82.45	0.00

MITIGATED SCENARIOS

Annual Average Daily Phase 1 construction from Urbemis2007 (lb/dy)

	ROG	Nox	PM10	PM2.5
Community Preferred Plan (and Recology variant)				
2014	6.45	43.79	0.96	0.89
2015	8.17	43.66	1.69	1.51
2016	7.51	39.38	1.57	1.39
2017	30.22	41.16	1.59	1.41
2018	23.34	8.07	0.12	0.11
2019	2.49	2.49	0.05	0.05
BAAQMD Thr	54	54	82	54
Exceeds Thre	Yes	Yes	No	No
Developer Sponsored Project (and Entertainment variant)				
2014	5.67	37.98	0.83	0.76
2015	12.51	**72.80**	2.91	2.59
2016	11.51	**65.54**	2.70	2.40
2017	48.09	**64.57**	2.64	2.34
2018	37.58	5.33	0.11	0.10
2019	36.76	2.48	0.05	0.05

Revised Phase 1 emissions with tranport to railyard

	ROG	Nox	PM10	PM2.5
2014	6.60	**49.06**	1.04	0.95
2015	8.32	48.93	1.77	1.57
2016	7.67	44.65	1.64	1.46
2017	**30.37**	**46.43**	1.66	1.47
2018	**23.49**	13.34	0.20	0.18
2019	2.64	7.76	0.13	0.12
2014	5.83	**43.26**	0.91	0.83
2015	12.67	**78.07**	2.99	2.66
2016	11.67	**70.81**	2.77	2.46
2017	**48.24**	**69.84**	2.71	2.40
2018	**37.73**	10.60	0.19	0.17
2019	**36.91**	7.76	0.13	0.12

Revised Phase 1 emissions with OFFROAD and EMFAC2011 corrections

	ROG	**Nox**	**PM10**	**PM2.5**
2014	**4.74**	**40.82**	**0.85**	**0.78**
2015	**11.07**	**56.03**	**0.76**	**0.68**
2016	**10.04**	**50.57**	**0.69**	**0.65**
2017	**30.96**	**49.63**	**0.85**	**0.76**
2018	**23.27**	**12.49**	**0.16**	**0.15**
2019	**2.64**	**7.08**	**0.11**	**0.10**
2014	**4.19**	**36.10**	**0.74**	**0.68**
2015	**16.87**	**89.90**	**1.25**	**1.13**
2016	**15.31**	**80.66**	**1.13**	**1.06**
2017	**49.18**	**56.75**	**0.42**	**0.37**
2018	**37.37**	**10.04**	**0.16**	**0.14**
2019	**36.91**	**7.08**	**0.11**	**0.10**

Adjustments to reflect ARB's 2011 Inventory Model for In-Use Off-Road Equipment	ROG	Nox	PM10	PM2.5
OFFROAD2007 to 2011 EF and LF average adjustment factor (separate workbook) =	0.52	0.719	0.729	0.729

For construction worker trips URBEMIS assumes 50% LDA and 50% LDT	ROG	Nox	PM10	PM2.5
EMFAC2007 to EMFAC2011 Correction percentage for construction workers =	1.97	1.58	0.2	0.2

For Construction vendor trps URBEMIS assumes 100% HHD				
EMFAC2007 to EMFAC2011 Correction percentage for construction vendors =	1	1.24	0.28	0.28
(separate workbook)				

Percentage vendor trip emissions (URBEMIS)

	ROG	Nox	PM10	PM2.5
2014	0	0	0	0
2015	0.31	0.62	0.50	0.50
2016	0.31	0.61	0.50	0.50
2017	0.03	0.49	0.35	0.34
2018	0.00	0.00	0.00	0.00
2019	0.00	0.00	0.00	0.00

Percentage worker trip emissions (URBEMIS)

	ROG	Nox	PM10	PM2.5
2014	0.00	0.00	0.00	0.00
2015	0.46	0.14	0.19	0.18
2016	0.45	0.14	0.21	0.21
2017	0.04	0.12	0.16	0.16
2018	0.00	0.11	0.00	0.00
2019	0.00	0.00	0.00	0.00

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Urbemis 2007 Version 9.2.4

Summary Report for Annual Emissions (Tons/Year)

File Name: C:\Documents and Settings\cls\Application Data\Urbemis\Version9a\Projects\Bribsane Construction CPP Phase 1.urb924

Project Name: Brisbane Baylands - CPP construction Phase 1

Project Location: San Mateo County

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

Off-Road Vehicle Emissions Based on: OFFROAD2007

CONSTRUCTION EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5	CO2
2014 TOTALS (tons/year unmitigated)	1.18	10.94	5.51	0.01	61.89	0.46	62.35	12.92	0.42	13.35	1,756.46
2014 TOTALS (tons/year mitigated)	1.18	7.99	5.51	0.01	61.78	0.18	61.95	12.90	0.16	13.06	1,756.46
Percent Reduction	0.00	26.94	0.00	0.00	0.18	61.65	0.64	0.18	61.65	2.13	0.00
2015 TOTALS (tons/year unmitigated)	1.49	8.81	29.91	0.05	0.24	0.42	0.66	0.08	0.38	0.46	5,595.47
2015 TOTALS (tons/year mitigated)	1.49	7.97	29.91	0.05	0.24	0.31	0.54	0.08	0.27	0.36	5,595.47
Percent Reduction	0.00	9.58	0.00	0.00	0.00	26.89	17.28	0.00	27.56	22.60	0.00
2016 TOTALS (tons/year unmitigated)	1.37	7.96	28.06	0.05	0.24	0.38	0.62	0.08	0.34	0.43	5,595.71
2016 TOTALS (tons/year mitigated)	1.37	7.19	28.06	0.05	0.24	0.29	0.52	0.08	0.25	0.34	5,595.71
Percent Reduction	0.00	9.73	0.00	0.00	0.00	25.35	15.72	0.00	26.06	20.97	0.00
2017 TOTALS (tons/year unmitigated)	14.75	8.89	27.69	0.05	0.24	0.49	0.73	0.08	0.44	0.53	5,801.55
2017 TOTALS (tons/year mitigated)	5.51	7.51	27.69	0.05	0.24	0.29	0.53	0.08	0.26	0.34	5,801.55
Percent Reduction	62.60	15.49	0.00	0.00	0.00	41.06	27.73	0.00	41.99	35.31	0.00
2018 TOTALS (tons/year unmitigated)	13.53	1.61	1.47	0.00	0.00	0.13	0.13	0.00	0.12	0.12	227.79
2018 TOTALS (tons/year mitigated)	4.26	0.98	1.47	0.00	0.00	0.02	0.02	0.00	0.02	0.02	227.79
Percent Reduction	68.51	39.09	0.00	0.00	0.00	83.83	82.57	0.00	83.89	83.40	0.00
2019 TOTALS (tons/year unmitigated)	13.37	0.75	0.76	0.00	0.00	0.06	0.06	0.00	0.05	0.05	120.57
2019 TOTALS (tons/year mitigated)	4.11	0.45	0.76	0.00	0.00	0.01	0.01	0.00	0.01	0.01	120.57
Percent Reduction	69.30	39.01	0.00	0.00	0.00	83.49	81.58	0.00	83.59	82.83	0.00

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Urbemis 2007 Version 9.2.4

Summary Report for Annual Emissions (Tons/Year)

File Name: C:\Documents and Settings\cls\Application Data\Urbemis\Version9a\Projects\Bribsane Construction CPP Phase 2.urb924

Project Name: Brisbane Baylands - CPP construction Phase 2

Project Location: San Mateo County

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

Off-Road Vehicle Emissions Based on: OFFROAD2007

CONSTRUCTION EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5	CO2
2020 TOTALS (tons/year unmitigated)	0.76	5.81	4.06	0.01	66.21	0.23	66.44	13.83	0.21	14.04	1,604.32
2020 TOTALS (tons/year mitigated)	0.76	4.12	4.06	0.01	39.82	0.08	39.91	8.32	0.08	8.39	1,604.32
Percent Reduction	0.00	29.09	0.00	0.00	39.85	64.79	39.94	39.85	64.81	40.23	0.00
2021 TOTALS (tons/year unmitigated)	1.41	9.30	25.34	0.10	0.44	0.49	0.92	0.15	0.43	0.58	10,840.45
2021 TOTALS (tons/year mitigated)	1.41	9.30	25.34	0.10	0.44	0.49	0.92	0.15	0.43	0.58	10,840.45
Percent Reduction	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2022 TOTALS (tons/year unmitigated)	1.40	9.27	25.24	0.10	0.44	0.49	0.92	0.15	0.43	0.58	10,798.92
2022 TOTALS (tons/year mitigated)	1.40	9.27	25.24	0.10	0.44	0.49	0.92	0.15	0.43	0.58	10,798.92
Percent Reduction	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2023 TOTALS (tons/year unmitigated)	15.88	10.65	26.62	0.10	0.44	0.59	1.03	0.15	0.53	0.68	11,024.80
2023 TOTALS (tons/year mitigated)	5.91	10.10	26.62	0.10	0.44	0.50	0.94	0.15	0.45	0.60	11,024.80
Percent Reduction	62.78	5.14	0.00	0.00	0.00	15.28	8.80	0.00	15.74	12.22	0.00
2024 TOTALS (tons/year unmitigated)	14.59	1.40	1.39	0.00	0.00	0.11	0.11	0.00	0.10	0.10	227.62
2024 TOTALS (tons/year mitigated)	4.56	0.85	1.39	0.00	0.00	0.02	0.02	0.00	0.02	0.02	227.62
Percent Reduction	68.76	39.51	0.00	0.00	0.00	84.02	82.56	0.00	84.09	83.52	0.00
2025 TOTALS (tons/year unmitigated)	14.53	1.39	1.38	0.00	0.00	0.11	0.11	0.00	0.10	0.10	226.75
2025 TOTALS (tons/year mitigated)	4.52	0.84	1.38	0.00	0.00	0.02	0.02	0.00	0.02	0.02	226.75
Percent Reduction	68.87	39.51	0.00	0.00	0.00	84.02	82.56	0.00	84.09	83.52	0.00
2026 TOTALS (tons/year unmitigated)	0.12	0.69	0.65	0.00	0.00	0.05	0.05	0.00	0.05	0.05	103.65
2026 TOTALS (tons/year mitigated)	0.12	0.41	0.65	0.00	0.00	0.01	0.01	0.00	0.01	0.01	103.65
Percent Reduction	0.00	39.67	0.00	0.00	0.00	84.42	83.57	0.00	84.45	84.13	0.00

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Urbemis 2007 Version 9.2.4

Summary Report for Annual Emissions (Tons/Year)

File Name: C:\Documents and Settings\cls\Application Data\Urbemis\Version9a\Projects\Bribsane Construction CPPREV Phase 2.urb924

Project Name: Brisbane Baylands - CPPREV construction Phase 2

Project Location: San Mateo County

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

Off-Road Vehicle Emissions Based on: OFFROAD2007

CONSTRUCTION EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5	CO2
2020 TOTALS (tons/year unmitigated)	0.76	5.81	4.06	0.01	68.98	0.23	69.21	14.40	0.21	14.62	1,604.32
2020 TOTALS (tons/year mitigated)	0.76	4.12	4.06	0.01	68.98	0.08	69.06	14.40	0.08	14.48	1,604.32
Percent Reduction	0.00	29.09	0.00	0.00	0.00	64.79	0.22	0.00	64.81	0.95	0.00
2021 TOTALS (tons/year unmitigated)	1.37	8.87	25.12	0.10	0.43	0.47	0.90	0.15	0.42	0.57	10,551.92
2021 TOTALS (tons/year mitigated)	1.37	8.32	25.12	0.10	0.43	0.42	0.84	0.15	0.37	0.52	10,551.92
Percent Reduction	0.00	6.18	0.00	0.00	0.00	11.71	6.14	0.00	12.16	8.95	0.00
2022 TOTALS (tons/year unmitigated)	1.36	8.84	25.03	0.10	0.43	0.47	0.89	0.15	0.42	0.56	10,511.49
2022 TOTALS (tons/year mitigated)	1.36	8.29	25.03	0.10	0.43	0.41	0.84	0.15	0.37	0.51	10,511.49
Percent Reduction	0.00	6.18	0.00	0.00	0.00	11.71	6.14	0.00	12.16	8.95	0.00
2023 TOTALS (tons/year unmitigated)	16.49	10.22	26.41	0.10	0.43	0.58	1.00	0.15	0.51	0.66	10,738.50
2023 TOTALS (tons/year mitigated)	6.06	9.13	26.41	0.10	0.43	0.43	0.86	0.15	0.38	0.53	10,738.50
Percent Reduction	63.23	10.70	0.00	0.00	0.00	25.24	14.49	0.00	26.02	20.16	0.00
2024 TOTALS (tons/year unmitigated)	15.24	1.40	1.39	0.00	0.00	0.11	0.11	0.00	0.10	0.10	228.76
2024 TOTALS (tons/year mitigated)	4.76	0.85	1.39	0.00	0.00	0.02	0.02	0.00	0.02	0.02	228.76
Percent Reduction	68.80	39.49	0.00	0.00	0.00	83.99	82.49	0.00	84.06	83.48	0.00
2025 TOTALS (tons/year unmitigated)	15.18	1.39	1.38	0.00	0.00	0.11	0.11	0.00	0.10	0.10	227.89
2025 TOTALS (tons/year mitigated)	4.72	0.84	1.38	0.00	0.00	0.02	0.02	0.00	0.02	0.02	227.89
Percent Reduction	68.92	39.49	0.00	0.00	0.00	83.99	82.49	0.00	84.06	83.48	0.00
2026 TOTALS (tons/year unmitigated)	0.12	0.69	0.65	0.00	0.00	0.05	0.05	0.00	0.05	0.05	103.82
2026 TOTALS (tons/year mitigated)	0.12	0.41	0.65	0.00	0.00	0.01	0.01	0.00	0.01	0.01	103.82
Percent Reduction	0.00	39.66	0.00	0.00	0.00	84.41	83.55	0.00	84.44	84.11	0.00

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Urbemis 2007 Version 9.2.4

Summary Report for Annual Emissions (Tons/Year)

File Name: C:\Documents and Settings\cls\Application Data\Urbemis\Version9a\Projects\Bribsane Construction DSP Phase 1.urb924

Project Name: Brisbane Baylands - DSP construction Phase 1

Project Location: San Mateo County

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

Off-Road Vehicle Emissions Based on: OFFROAD2007

CONSTRUCTION EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5	CO2
2014 TOTALS (tons/year unmitigated)	1.04	9.53	4.94	0.01	43.52	0.41	43.93	9.09	0.37	9.46	1,519.00
2014 TOTALS (tons/year mitigated)	1.04	6.93	4.94	0.01	43.41	0.15	43.56	9.06	0.14	9.20	1,519.00
Percent Reduction	0.00	27.25	0.00	0.00	0.26	62.55	0.84	0.26	62.56	2.72	0.00
2015 TOTALS (tons/year unmitigated)	2.28	14.13	47.93	0.09	0.39	0.65	1.04	0.14	0.58	0.72	9,235.75
2015 TOTALS (tons/year mitigated)	2.28	13.29	47.93	0.09	0.39	0.53	0.92	0.14	0.47	0.61	9,235.75
Percent Reduction	0.00	5.98	0.00	0.00	0.00	17.62	10.95	0.00	18.10	14.59	0.00
2016 TOTALS (tons/year unmitigated)	2.10	12.74	44.92	0.09	0.39	0.59	0.98	0.14	0.53	0.67	9,236.12
2016 TOTALS (tons/year mitigated)	2.10	11.96	44.92	0.09	0.39	0.49	0.89	0.14	0.44	0.58	9,236.12
Percent Reduction	0.00	6.08	0.00	0.00	0.00	16.50	9.90	0.00	16.99	13.45	0.00
2017 TOTALS (tons/year unmitigated)	24.06	13.16	43.46	0.09	0.39	0.68	1.08	0.14	0.61	0.75	9,435.22
2017 TOTALS (tons/year mitigated)	8.78	11.78	43.46	0.09	0.39	0.48	0.87	0.14	0.43	0.57	9,435.22
Percent Reduction	63.53	10.46	0.00	0.00	0.00	29.55	18.74	0.00	30.34	24.71	0.00
2018 TOTALS (tons/year unmitigated)	22.20	1.60	1.53	0.00	0.00	0.13	0.13	0.00	0.12	0.12	234.82
2018 TOTALS (tons/year mitigated)	6.86	0.97	1.53	0.00	0.00	0.02	0.02	0.00	0.02	0.02	234.82
Percent Reduction	69.12	39.23	0.00	0.00	0.00	83.86	82.36	0.00	83.94	83.35	0.00
2019 TOTALS (tons/year unmitigated)	22.05	0.74	0.81	0.00	0.00	0.06	0.06	0.00	0.05	0.05	129.28
2019 TOTALS (tons/year mitigated)	6.71	0.45	0.81	0.00	0.00	0.01	0.01	0.00	0.01	0.01	129.28
Percent Reduction	69.58	39.07	0.00	0.00	0.00	83.32	80.79	0.00	83.45	82.45	0.00

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Urbemis 2007 Version 9.2.4

Summary Report for Annual Emissions (Tons/Year)

File Name: C:\Documents and Settings\cls\Application Data\Urbemis\Version9a\Projects\Bribsane Construction DSP Phase 2.urb924

Project Name: Brisbane Baylands - DSP construction Phase 2

Project Location: San Mateo County

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

Off-Road Vehicle Emissions Based on: OFFROAD2007

CONSTRUCTION EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5	CO2
2020 TOTALS (tons/year unmitigated)	0.76	5.81	4.06	0.01	103.84	0.23	104.07	21.68	0.21	21.90	1,604.32
2020 TOTALS (tons/year mitigated)	0.76	4.29	4.06	0.01	103.84	0.10	103.94	21.68	0.09	21.78	1,604.32
Percent Reduction	0.00	26.11	0.00	0.00	0.00	56.26	0.13	0.00	56.28	0.55	0.00
2021 TOTALS (tons/year unmitigated)	1.60	9.84	32.88	0.12	0.55	0.55	1.10	0.19	0.48	0.68	13,120.56
2021 TOTALS (tons/year mitigated)	1.60	9.29	32.88	0.12	0.55	0.49	1.04	0.19	0.43	0.63	13,120.56
Percent Reduction	0.00	5.57	0.00	0.00	0.00	10.03	5.03	0.00	10.46	7.50	0.00
2022 TOTALS (tons/year unmitigated)	1.60	9.80	32.76	0.12	0.54	0.55	1.09	0.19	0.48	0.67	13,070.29
2022 TOTALS (tons/year mitigated)	1.60	9.26	32.76	0.12	0.54	0.49	1.04	0.19	0.43	0.62	13,070.29
Percent Reduction	0.00	5.57	0.00	0.00	0.00	10.03	5.03	0.00	10.46	7.50	0.00
2023 TOTALS (tons/year unmitigated)	24.91	11.20	34.17	0.12	0.55	0.66	1.20	0.19	0.58	0.77	13,311.55
2023 TOTALS (tons/year mitigated)	8.76	10.10	34.17	0.12	0.55	0.51	1.06	0.19	0.45	0.64	13,311.55
Percent Reduction	64.84	9.77	0.00	0.00	0.00	22.19	12.10	0.00	23.00	17.30	0.00
2024 TOTALS (tons/year unmitigated)	23.49	1.41	1.43	0.00	0.00	0.11	0.11	0.00	0.10	0.10	243.11
2024 TOTALS (tons/year mitigated)	7.24	0.85	1.43	0.00	0.00	0.02	0.02	0.00	0.02	0.02	243.11
Percent Reduction	69.16	39.25	0.00	0.00	0.00	83.62	81.67	0.00	83.72	82.95	0.00
2025 TOTALS (tons/year unmitigated)	23.40	1.40	1.42	0.00	0.00	0.11	0.11	0.00	0.10	0.10	242.19
2025 TOTALS (tons/year mitigated)	7.19	0.85	1.42	0.00	0.00	0.02	0.02	0.00	0.02	0.02	242.19
Percent Reduction	69.28	39.25	0.00	0.00	0.00	83.62	81.67	0.00	83.72	82.95	0.00
2026 TOTALS (tons/year unmitigated)	0.12	0.69	0.65	0.00	0.00	0.05	0.05	0.00	0.05	0.05	106.05
2026 TOTALS (tons/year mitigated)	0.12	0.42	0.65	0.00	0.00	0.01	0.01	0.00	0.01	0.01	106.05
Percent Reduction	0.00	39.51	0.00	0.00	0.00	84.26	83.29	0.00	84.30	83.92	0.00

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Urbemis 2007 Version 9.2.4

Summary Report for Annual Emissions (Tons/Year)

File Name: C:\Documents and Settings\cls\Application Data\Urbemis\Version9a\Projects\Bribsane Construction DSPE Phase 2.urb924

Project Name: Brisbane Baylands - DSPE construction Phase 2

Project Location: San Mateo County

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

Off-Road Vehicle Emissions Based on: OFFROAD2007

CONSTRUCTION EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5	CO2
2020 TOTALS (tons/year unmitigated)	1.04	7.77	4.92	0.01	253.16	0.30	253.46	52.87	0.28	53.14	1,992.10
2020 TOTALS (tons/year mitigated)	1.04	5.30	4.92	0.01	145.55	0.09	145.64	30.39	0.08	30.48	1,992.10
Percent Reduction	0.00	31.84	0.00	0.00	42.51	69.31	42.54	42.51	69.33	42.65	0.00
2021 TOTALS (tons/year unmitigated)	4.73	31.03	94.10	0.38	1.68	1.67	3.35	0.59	1.47	2.06	40,693.29
2021 TOTALS (tons/year mitigated)	4.73	30.48	94.10	0.38	1.68	1.61	3.29	0.59	1.42	2.01	40,693.29
Percent Reduction	0.00	1.77	0.00	0.00	0.00	3.31	1.65	0.00	3.45	2.46	0.00
2022 TOTALS (tons/year unmitigated)	4.71	30.91	93.74	0.38	1.68	1.66	3.34	0.59	1.46	2.05	40,537.38
2022 TOTALS (tons/year mitigated)	4.71	30.36	93.74	0.38	1.68	1.60	3.28	0.59	1.41	2.00	40,537.38
Percent Reduction	0.00	1.77	0.00	0.00	0.00	3.31	1.65	0.00	3.45	2.46	0.00
2023 TOTALS (tons/year unmitigated)	63.08	32.34	95.31	0.38	1.68	1.77	3.45	0.59	1.57	2.15	40,839.65
2023 TOTALS (tons/year mitigated)	22.41	31.25	95.31	0.38	1.68	1.62	3.31	0.59	1.43	2.02	40,839.65
Percent Reduction	64.47	3.38	0.00	0.00	0.00	8.23	4.22	0.00	8.55	6.22	0.00
2024 TOTALS (tons/year unmitigated)	58.81	1.44	1.59	0.00	0.01	0.11	0.12	0.00	0.10	0.10	304.60
2024 TOTALS (tons/year mitigated)	17.90	0.89	1.59	0.00	0.01	0.02	0.03	0.00	0.02	0.02	304.60
Percent Reduction	69.56	38.28	0.00	0.00	0.00	82.08	78.32	0.00	82.26	80.76	0.00
2025 TOTALS (tons/year unmitigated)	58.59	1.44	1.58	0.00	0.01	0.11	0.12	0.00	0.10	0.10	303.43
2025 TOTALS (tons/year mitigated)	17.77	0.89	1.58	0.00	0.01	0.02	0.03	0.00	0.02	0.02	303.43
Percent Reduction	69.68	38.28	0.00	0.00	0.00	82.08	78.32	0.00	82.26	80.76	0.00
2026 TOTALS (tons/year unmitigated)	0.15	0.70	0.65	0.00	0.00	0.05	0.05	0.00	0.05	0.05	115.59
2026 TOTALS (tons/year mitigated)	0.15	0.43	0.65	0.00	0.00	0.01	0.01	0.00	0.01	0.01	115.59
Percent Reduction	0.00	38.86	0.00	0.00	0.00	83.65	82.19	0.00	83.68	83.13	0.00

D.2
Operational Calculations

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Post Processsing EMFAC2011 Adjustment Calculations

Adjusted Emissions DSP Scenario:	Unmitigated (pounds/day)				Unmitigated (Tons/year)			
	ROG	Nox	PM10	PM2.5	ROG	Nox	PM10	PM2.5
Mobile emissions reported by URBEMIS:	116.67	96.53	620.81	117.16	20.27	13.49	113.31	21.37
Back out non-exhaust contribution for PM:			592.0975	99.93748			108.0694	18.22861
Mobile emissions from Exhaust:	116.67	96.53	28.71246	17.22252	20.27	13.49	5.240588	3.14139
EMFAC2011 Conversion Factor:	1.011317	1.046924	0.156732	0.150934	1.011317	1.046924	0.156732	0.150934
Adjusted Emission =	**117.99**	**101.06**	**596.60**	**102.54**	**20.50**	**14.12**	**108.89**	**18.70**
Adjusted Emissions DSPV Scenario:	Unmitigated (pounds/day)				Unmitigated (Tons/year)			
	ROG	Nox	PM10	PM2.5	ROG	Nox	PM10	PM2.5
Mobile emissions reported by URBEMIS:	110.55	90.63	582.71	109.95	19.16	12.66	106.33	20.08
Back out non-exhaust contribution for PM:			555.7597	93.78735			101.4122	17.12824
Mobile emissions from Exhaust:	110.55	90.63	26.95034	16.16265	19.16	12.66	4.917763	2.95176
EMFAC2011 Conversion Factor:	1.011317	1.046924	0.156732	0.150934	1.011317	1.046924	0.156732	0.150934
Adjusted Emission =	**111.80**	**94.88**	**559.98**	**96.23**	**19.38**	**13.25**	**102.18**	**17.57**
Adjusted Emissions CPP Scenario:	Unmitigated (pounds/day)				Unmitigated (Tons/year)			
	ROG	Nox	PM10	PM2.5	ROG	Nox	PM10	PM2.5
Mobile emissions reported by URBEMIS:	171.27	165.82	1063	200.46	30.46	23.18	194.01	36.58
Back out non-exhaust contribution for PM:			1013.836	170.9924			185.037	31.20274
Mobile emissions from Exhaust:	171.27	165.82	49.16375	29.46762	30.46	23.18	8.972963	5.37726
EMFAC2011 Conversion Factor:	1.011317	1.046924	0.156732	0.150934	1.011317	1.046924	0.156732	0.150934
Adjusted Emission =	**173.21**	**173.60**	**1021.54**	**175.44**	**30.80**	**24.27**	**186.44**	**32.01**
Adjusted Emissions CPP-V Scenario:	Unmitigated (pounds/day)				Unmitigated (Tons/year)			
	ROG	Nox	PM10	PM2.5	ROG	Nox	PM10	PM2.5
Mobile emissions reported by URBEMIS:	163.56	158.34	1015.05	191.4	28.95	22.14	185.24	34.93
Back out non-exhaust contribution for PM:			968.13	163.36			176.68	29.81
Mobile emissions from Exhaust:	163.56	158.34	46.92	28.04	28.95	22.14	8.56	5.12
EMFAC2011 Conversion Factor:	1.011317	1.046924	0.156732	0.150934	1.011317	1.046924	0.156732	0.150934
Adjusted Emission =	**165.41**	**165.77**	**975.48**	**167.59**	**29.28**	**23.18**	**178.02**	**30.58**
Adjusted Emissions Renewable Energy Alternative	Unmitigated (pounds/day)							
	ROG	Nox	PM10	PM2.5				
Mobile emissions reported by URBEMIS:	19.4	17.2	110.46	20.84				
Back out non-exhaust contribution for PM:			105.34	17.78				
Mobile emissions from Exhaust:	19.4	17.2	5.12	3.06				
EMFAC2011 Conversion Factor:	1.011317	1.046924	0.156732	0.150934				
Adjusted Emission =	**19.62**	**18.01**	**106.14**	**18.24**				

Conversion Factor Calculations for EMFAC2011 Post Processing Adjustment

EMFAC 2011
2035 Estimated Seasonal Emission Rates
EMFAC 2011 Vehicle Categories
Winter Season
San Mateo COUNTY
San Francisco Bay Area AIR BASIN
Bay Area AQMD

NOTE: URBEMIS/EMFAC2007 ran for year 2040; 2035 is latest analysis year available in EMFAC2011

Area	CalYr	Season	Veh	Fuel	MdlYr	Speed (Miles/hr)	ROG_RUNEX (gms/mile)	CO_RUNEX (gms/mile)	NOX_RUNEX (gms/mile)	CO2_RUNEX (gms/mile)	PM10_RUNEX (gms/mile)	PM2_5_RUNEX (gms/mile)
San Mateo (SF)	2035	Winter	LDA	GAS	AllMYr	35	0.008105808	0.581709994	0.058975026	314.2962617	1.92E-03	1.78E-03
San Mateo (SF)	2035	Winter	LDT1	GAS	AllMYr	35	0.011550012	0.793298719	0.076939928	365.2404401	1.91E-03	1.77E-03
San Mateo (SF)	2035	Winter	LDT2	GAS	AllMYr	35	0.010762506	0.733177203	0.079257783	427.674597	1.90E-03	1.76E-03
San Mateo (SF)	2035	Winter	MDV	GAS	AllMYr	35	0.015413645	1.000344795	0.110331757	548.0066457	1.85E-03	1.72E-03
San Mateo (SF)	2035	Winter	LHD1	GAS	AllMYr	35	0.007780937	0.159111802	0.151650852	527.8465377	2.45E-04	2.27E-04
San Mateo (SF)	2035	Winter	LHD1	DSL	AllMYr	35	0.070365475	0.554663947	0.896164616	519.0658135	1.88E-02	1.73E-02
San Mateo (SF)	2035	Winter	LHD2	GAS	AllMYr	35	0.005660032	0.116258833	0.110509556	527.8465366	1.76E-04	1.63E-04
San Mateo (SF)	2035	Winter	LHD2	DSL	AllMYr	35	0.064727208	0.525972273	0.816615459	519.1967058	1.77E-02	1.62E-02
San Mateo (SF)	2035	Winter	T6 instate h	DSL	AllMYr	35	0.096380023	0.349906103	1.134522162	1134.543175	3.21E-02	2.96E-02
San Mateo (SF)	2035	Winter	T6TS	GAS	AllMYr	35	0.015110031	0.287660211	0.202648415	527.8465505	1.81E-04	1.68E-04
San Mateo (SF)	2035	Winter	All Other B	DSL	AllMYr	35	0.103850316	0.377026878	1.269152735	1134.582437	3.54E-02	3.25E-02
San Mateo (SF)	2035	Winter	UBUS	DSL	AllMYr	35	0.336711347	1.213169485	8.108432178	2394.880331	1.52E-01	1.40E-01
San Mateo (SF)	2035	Winter	MCY	GAS	AllMYr	35	1.975455666	16.18331492	1.205937709	141.6729825	1.82E-04	1.58E-04
San Mateo (SF)	2035	Winter	MH	GAS	AllMYr	35	0.008880177	0.158867138	0.162307135	527.8465177	1.67E-04	1.55E-04
Composite Fleet EMFAC2011 Emission Factor =							**0.065385404**		**0.109354868**	**327.1795395**	**2.00E-03**	**1.85E-03**

URBEMIS Vehicle Fleet Mix

Vehicle Type	Percent type
LDA	57.00%
LDT1	11.30%
LDT2	19.60%
MDV	6.40%
LDH1 -Gas	0.70%
LDH1 - Diesel	0.10%
LDH2- Gas	0.40%
LDH2 - Diesel	0.20%
MDH -Gas	0.20%
MDH - Diesel	0.70%
Other Bus	0.10%
Urban Bus	0.10%
Motorcycle	2.80%

Motor Home - Gas	0.40%
	100.00%

Title : EMFAC2007 Year 2040
Version : Emfac2007 V2.3 Nov 1 2006
Run Date : 2012/11/19 13:45:56
Scen Year: 2040 -- All model years in the range 1996 to 2040 selected
Season : Winter
Area : San Mateo

Area	CalYr	Season	Veh	Fuel	MdlYr	Speed (Miles/hr)	ROG_RUNEX (gms/mile)	CO_RUNEX (gms/mile)	NOX_RUNEX (gms/mile)	CO2_RUNEX (gms/mile)	PM10_RUNEX (gms/mile)	PM2_5_RUNEX (gms/mile)
San Mateo (SF)	2035	Winter	LDA	GAS	AllMYr	35	0.005	0.431	0.04	299.744	0.008	0.008
San Mateo (SF)	2035	Winter	LDT1	GAS	AllMYr	35	0.005	0.519	0.046	378.664	0.011	0.01
San Mateo (SF)	2035	Winter	LDT2	GAS	AllMYr	35	0.01	0.876	0.083	387.342	0.024	0.023
San Mateo (SF)	2035	Winter	MDV	GAS	AllMYr	35	0.012	1.143	0.095	526.831	0.024	0.022
San Mateo (SF)	2035	Winter	LHD1	GAS	AllMYr	35	0.005	0.102	0.126	497.421	0.007	0.006
San Mateo (SF)	2035	Winter	LHD1	DSL	AllMYr	35	0.06	0.514	0.755	519	0.017	0.016
San Mateo (SF)	2035	Winter	LHD2	GAS	AllMYr	35	0.004		0.108	497.421	0.006	0.006
San Mateo (SF)	2035	Winter	LHD2	DSL	AllMYr	35	0.054		0.651	519	0.015	0.014
San Mateo (SF)	2035	Winter	T6 instate I	DSL	AllMYr	35	0.096		0.917	1505	0.113	0.104
San Mateo (SF)	2035	Winter	T6TS	GAS	AllMYr	35	0.01		0.189	497.421	0.008	8.00E-03
San Mateo (SF)	2035	Winter	All Other B	DSL	AllMYr	35	0.095		0.9	1505	0.112	1.03E-01
San Mateo (SF)	2035	Winter	UBUS	DSL	AllMYr	35	0.255		7.294	2302.372	0.113	0.104
San Mateo (SF)	2035	Winter	MCY	GAS	AllMYr	35	2.059		1.382	152.201	0.002	0.002
San Mateo (SF)	2035	Winter	MH	GAS	AllMYr	35	0.007		0.173	497.421	0.002	0.002
Composite Fleet EMFAC2007 Emission Factor =							**0.064653728**		**0.104453458**	**346.8565317**	**1.27E-02**	**1.23E-02**
EMFAC2007 to EMFAC2011 Correction percentage =							**1.011316835**		**1.046924348**	**0.943270516**	**0.156732057**	**0.15093415**

For Construction worker calculations URBEMIS assumes 50% LDA and 50% LDT1

Construction worker Composite Fleet Emission Factor in EMFAC2007 =	0.0050	0.043	0.0095	0.009
Construction worker Composite Fleet Emission Factor in EMFAC2011 =	0.010	0.068	0.002	0.002
EMFAC2007 to EMFAC2011 Correction percentage for construction workers =	1.965582	1.580406442	0.201451684	0.197298056

For Construction vendor trps URBEMIS assumes 100% HHD

EMFAC2007 to EMFAC2011 Correction percentage for construction vendors =	1.003958573	1.237210646	0.284386593	0.284277212

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Urbemis 2007 Version 9.2.4

Summary Report for Summer Emissions (Pounds/Day)

File Name: C:\Documents and Settings\cls\Application Data\Urbemis\Version9a\Projects\Bribsane Operation CPP.urb924

Project Name: Brisbane Baylands Operations CPP

Project Location: San Mateo County

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

Off-Road Vehicle Emissions Based on: OFFROAD2007

AREA SOURCE EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10	PM2.5	CO2
TOTALS (lbs/day, unmitigated)	49.43	52.82	55.07	0.00	0.13	0.13	63,236.55

OPERATIONAL (VEHICLE) EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10	PM2.5	CO2
TOTALS (lbs/day, unmitigated)	164.79	107.64	1,753.62	5.81	1,063.00	200.46	584,594.95

SUM OF AREA SOURCE AND OPERATIONAL EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10	PM2.5	CO2
TOTALS (lbs/day, unmitigated)	214.22	160.46	1,808.69	5.81	1,063.13	200.59	647,831.50

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Urbemis 2007 Version 9.2.4

Summary Report for Winter Emissions (Pounds/Day)

File Name: C:\Documents and Settings\cls\Application Data\Urbemis\Version9a\Projects\Bribsane Operation CPP.urb924

Project Name: Brisbane Baylands Operations CPP

Project Location: San Mateo County

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

Off-Road Vehicle Emissions Based on: OFFROAD2007

AREA SOURCE EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10	PM2.5	CO2
TOTALS (lbs/day, unmitigated)	48.57	52.68	44.25	0.00	0.09	0.09	63,216.89

OPERATIONAL (VEHICLE) EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10	PM2.5	CO2
TOTALS (lbs/day, unmitigated)	171.27	165.82	1,808.50	4.95	1,063.00	200.46	499,370.24

SUM OF AREA SOURCE AND OPERATIONAL EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10	PM2.5	CO2
TOTALS (lbs/day, unmitigated)	219.84	218.50	1,852.75	4.95	1,063.09	200.55	562,587.13

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Urbemis 2007 Version 9.2.4

Detail Report for Winter Operational Unmitigated Emissions (Pounds/Day)

File Name: C:\Documents and Settings\cls\Application Data\Urbemis\Version9a\Projects\Bribsane Operation CPP.urb924

Project Name: Brisbane Baylands Operations CPP

Project Location: San Mateo County

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

Off-Road Vehicle Emissions Based on: OFFROAD2007

OPERATIONAL EMISSION ESTIMATES (Winter Pounds Per Day, Unmitigated)

Source	ROG	NOX	CO	SO2	PM10	PM25	CO2
Hotel	28.82	27.89	303.70	0.83	178.66	33.68	83,845.59
Strip mall	56.72	54.88	597.01	1.63	351.41	66.25	164,804.06
General office building	12.03	11.68	128.36	0.35	75.11	14.18	35,472.46
Warehouse	1.62	1.56	17.00	0.05	10.01	1.89	4,693.76
General light industry	18.88	18.34	202.44	0.56	118.19	22.32	55,970.41
Entertainment/Cultural	39.61	38.32	416.91	1.14	245.40	46.26	115,087.83
Conference/Exhibition	13.59	13.15	143.08	0.39	84.22	15.88	39,496.13
TOTALS (lbs/day, unmitigated)	171.27	165.82	1,808.50	4.95	1,063.00	200.46	499,370.24

Does not include correction for passby trips

Does not include double counting adjustment for internal trips

Analysis Year: 2040 Temperature (F): 40 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
Hotel		7.03	rooms	1,990.00	13,989.70	104,328.19
Strip mall		12.56	1000 sq ft	2,210.00	27,757.60	205,211.94
General office building		5.45	1000 sq ft	993.00	5,411.85	43,849.51
Warehouse		2.16	1000 sq ft	366.00	790.56	5,844.61
General light industry		4.08	1000 sq ft	2,007.00	8,188.56	68,988.62
Entertainment/Cultural		24.23	1000 sq ft	800.00	19,384.00	143,305.91
Conference/Exhibition		24.19	1000 sq ft	275.00	6,652.25	49,180.08
					82,174.52	620,708.86

Vehicle Fleet Mix

Vehicle Type	Percent Type	Non-Catalyst	Catalyst	Diesel
Light Auto	57.0	0.0	100.0	0.0
Light Truck < 3750 lbs	11.3	0.0	100.0	0.0
Light Truck 3751-5750 lbs	19.6	0.0	100.0	0.0
Med Truck 5751-8500 lbs	6.4	0.0	100.0	0.0
Lite-Heavy Truck 8501-10,000 lbs	0.8	0.0	87.5	12.5
Lite-Heavy Truck 10,001-14,000 lbs	0.6	0.0	66.7	33.3
Med-Heavy Truck 14,001-33,000 lbs	0.9	0.0	22.2	77.8
Heavy-Heavy Truck 33,001-60,000 lbs	0.0	0.0	0.0	0.0
Other Bus	0.1	0.0	0.0	100.0
Urban Bus	0.1	0.0	0.0	100.0
Motorcycle	2.8	32.1	67.9	0.0
School Bus	0.0	0.0	0.0	0.0

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Vehicle Fleet Mix

Vehicle Type	Percent Type	Non-Catalyst	Catalyst	Diesel
Motor Home	0.4	0.0	100.0	0.0

Travel Conditions

	Residential			Commercial		
	Home-Work	Home-Shop	Home-Other	Commute	Non-Work	Customer
Urban Trip Length (miles)	10.8	7.3	7.5	9.5	7.4	7.4
Rural Trip Length (miles)	16.8	7.1	7.9	14.7	6.6	6.6
Trip speeds (mph)	35.0	35.0	35.0	35.0	35.0	35.0
% of Trips - Residential	32.9	18.0	49.1			
% of Trips - Commercial (by land use)						
Hotel				5.0	2.5	92.5
Strip mall				2.0	1.0	97.0
General office building				35.0	17.5	47.5
Warehouse				2.0	1.0	97.0
General light industry				50.0	25.0	25.0
Entertainment/Cultural				2.0	1.0	97.0
Conference/Exhibition				2.0	1.0	97.0

Operational Changes to Defaults

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Urbemis 2007 Version 9.2.4

Summary Report for Summer Emissions (Pounds/Day)

File Name: C:\Documents and Settings\cls\Application Data\Urbemis\Version9a\Projects\Bribsane Operation CPPRV.urb924

Project Name: Brisbane Baylands Operations CPPRV

Project Location: San Mateo County

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

Off-Road Vehicle Emissions Based on: OFFROAD2007

AREA SOURCE EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10	PM2.5	CO2
TOTALS (lbs/day, unmitigated)	45.76	48.90	51.78	0.00	0.13	0.13	58,532.55

OPERATIONAL (VEHICLE) EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10	PM2.5	CO2
TOTALS (lbs/day, unmitigated)	156.21	102.76	1,674.02	5.56	1,015.05	191.40	558,181.86

SUM OF AREA SOURCE AND OPERATIONAL EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10	PM2.5	CO2
TOTALS (lbs/day, unmitigated)	201.97	151.66	1,725.80	5.56	1,015.18	191.53	616,714.41

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Urbemis 2007 Version 9.2.4

Summary Report for Winter Emissions (Pounds/Day)

File Name: C:\Documents and Settings\cls\Application Data\Urbemis\Version9a\Projects\Bribsane Operation CPPRV.urb924

Project Name: Brisbane Baylands Operations CPPRV

Project Location: San Mateo County

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

Off-Road Vehicle Emissions Based on: OFFROAD2007

AREA SOURCE EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10	PM2.5	CO2
TOTALS (lbs/day, unmitigated)	44.90	48.76	40.96	0.00	0.09	0.09	58,512.89

OPERATIONAL (VEHICLE) EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10	PM2.5	CO2
TOTALS (lbs/day, unmitigated)	163.56	158.34	1,726.79	4.74	1,015.05	191.40	476,801.21

SUM OF AREA SOURCE AND OPERATIONAL EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10	PM2.5	CO2
TOTALS (lbs/day, unmitigated)	208.46	207.10	1,767.75	4.74	1,015.14	191.49	535,314.10

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Urbemis 2007 Version 9.2.4

Detail Report for Winter Operational Unmitigated Emissions (Pounds/Day)

File Name: C:\Documents and Settings\cls\Application Data\Urbemis\Version9a\Projects\Bribsane Operation CPPRV.urb924

Project Name: Brisbane Baylands Operations CPPRV

Project Location: San Mateo County

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

Off-Road Vehicle Emissions Based on: OFFROAD2007

OPERATIONAL EMISSION ESTIMATES (Winter Pounds Per Day, Unmitigated)

Source	ROG	NOX	CO	SO2	PM10	PM25	CO2
Hotel	21.97	21.26	231.52	0.63	136.20	25.68	63,919.40
Strip mall	57.44	55.57	604.62	1.66	355.89	67.09	166,903.48
General office building	12.19	11.83	130.01	0.36	76.08	14.36	35,928.07
Warehouse	1.63	1.58	17.16	0.05	10.10	1.90	4,737.22
General light industry	16.42	15.95	176.09	0.48	102.80	19.41	48,685.18
Entertainment/Cultural	40.12	38.81	422.24	1.16	248.54	46.85	116,560.27
Conference/Exhibition	13.79	13.34	145.15	0.40	85.44	16.11	40,067.59
TOTALS (lbs/day, unmitigated)	163.56	158.34	1,726.79	4.74	1,015.05	191.40	476,801.21

Does not include correction for passby trips

Does not include double counting adjustment for internal trips

Analysis Year: 2040 Temperature (F): 40 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
Hotel		7.11	rooms	1,500.00	10,665.00	79,534.24
Strip mall		12.72	1000 sq ft	2,210.00	28,111.20	207,826.10
General office building		5.52	1000 sq ft	993.00	5,481.36	44,412.72
Warehouse		2.18	1000 sq ft	366.00	797.88	5,898.73
General light industry		4.26	1000 sq ft	1,672.00	7,122.72	60,008.92
Entertainment/Cultural		24.54	1000 sq ft	800.00	19,632.00	145,139.38
Conference/Exhibition		24.54	1000 sq ft	275.00	6,748.50	49,891.66
					78,558.66	592,711.75

Vehicle Fleet Mix

Vehicle Type	Percent Type	Non-Catalyst	Catalyst	Diesel
Light Auto	57.0	0.0	100.0	0.0
Light Truck < 3750 lbs	11.3	0.0	100.0	0.0
Light Truck 3751-5750 lbs	19.6	0.0	100.0	0.0
Med Truck 5751-8500 lbs	6.4	0.0	100.0	0.0
Lite-Heavy Truck 8501-10,000 lbs	0.8	0.0	87.5	12.5
Lite-Heavy Truck 10,001-14,000 lbs	0.6	0.0	66.7	33.3
Med-Heavy Truck 14,001-33,000 lbs	0.9	0.0	22.2	77.8
Heavy-Heavy Truck 33,001-60,000 lbs	0.0	0.0	0.0	0.0
Other Bus	0.1	0.0	0.0	100.0
Urban Bus	0.1	0.0	0.0	100.0
Motorcycle	2.8	32.1	67.9	0.0
School Bus	0.0	0.0	0.0	0.0

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Vehicle Fleet Mix

Vehicle Type	Percent Type	Non-Catalyst	Catalyst	Diesel
Motor Home	0.4	0.0	100.0	0.0

Travel Conditions

	Residential			Commercial		
	Home-Work	Home-Shop	Home-Other	Commute	Non-Work	Customer
Urban Trip Length (miles)	10.8	7.3	7.5	9.5	7.4	7.4
Rural Trip Length (miles)	16.8	7.1	7.9	14.7	6.6	6.6
Trip speeds (mph)	35.0	35.0	35.0	35.0	35.0	35.0
% of Trips - Residential	32.9	18.0	49.1			
% of Trips - Commercial (by land use)						
Hotel				5.0	2.5	92.5
Strip mall				2.0	1.0	97.0
General office building				35.0	17.5	47.5
Warehouse				2.0	1.0	97.0
General light industry				50.0	25.0	25.0
Entertainment/Cultural				2.0	1.0	97.0
Conference/Exhibition				2.0	1.0	97.0

Operational Changes to Defaults

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Urbemis 2007 Version 9.2.4

Summary Report for Summer Emissions (Pounds/Day)

File Name: C:\Documents and Settings\cls\Application Data\Urbemis\Version9a\Projects\Bribsane Operation DSP.urb924

Project Name: Brisbane Baylands Operations DSP

Project Location: San Mateo County

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

Off-Road Vehicle Emissions Based on: OFFROAD2007

AREA SOURCE EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10	PM2.5	CO2
TOTALS (lbs/day, unmitigated)	292.82	61.95	51.93	0.00	0.17	0.16	76,702.78

OPERATIONAL (VEHICLE) EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10	PM2.5	CO2
TOTALS (lbs/day, unmitigated)	116.67	62.56	1,040.95	3.43	620.81	117.16	342,904.56

SUM OF AREA SOURCE AND OPERATIONAL EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10	PM2.5	CO2
TOTALS (lbs/day, unmitigated)	409.49	124.51	1,092.88	3.43	620.98	117.32	419,607.34

2/13/2013 11:25:30 AM

Urbemis 2007 Version 9.2.4

Summary Report for Winter Emissions (Pounds/Day)

File Name: C:\Documents and Settings\cls\Application Data\Urbemis\Version9a\Projects\Bribsane Operation DSP.urb924

Project Name: Brisbane Baylands Operations DSP

Project Location: San Mateo County

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

Off-Road Vehicle Emissions Based on: OFFROAD2007

AREA SOURCE EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10	PM2.5	CO2
TOTALS (lbs/day, unmitigated)	293.14	86.28	48.45	0.16	2.10	2.07	107,976.32

OPERATIONAL (VEHICLE) EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10	PM2.5	CO2
TOTALS (lbs/day, unmitigated)	99.80	96.53	1,062.72	2.91	620.81	117.16	293,141.94

SUM OF AREA SOURCE AND OPERATIONAL EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10	PM2.5	CO2
TOTALS (lbs/day, unmitigated)	392.94	182.81	1,111.17	3.07	622.91	119.23	401,118.26

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Urbemis 2007 Version 9.2.4

Detail Report for Winter Area Source Unmitigated Emissions (Pounds/Day)

File Name: C:\Documents and Settings\cls\Application Data\Urbemis\Version9a\Projects\Bribsane Operation DSP.urb924

Project Name: Brisbane Baylands Operations DSP

Project Location: San Mateo County

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

Off-Road Vehicle Emissions Based on: OFFROAD2007

AREA SOURCE EMISSION ESTIMATES (Winter Pounds Per Day, Unmitigated)

Source	ROG	NOx	CO	SO2	PM10	PM2.5	CO2
Natural Gas	4.64	61.76	38.02	0.00	0.12	0.11	76,677.50
Hearth	1.43	24.52	10.43	0.16	1.98	1.96	31,298.82
Landscaping - No Winter Emissions							
Consumer Products	216.93						
Architectural Coatings	70.14						
TOTALS (lbs/day, unmitigated)	293.14	86.28	48.45	0.16	2.10	2.07	107,976.32

Area Source Changes to Defaults

Percentage of residences with wood stoves changed from 35% to 0%

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

Percentage of residences with natural gas fireplaces changed from 55% to 100%

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Urbemis 2007 Version 9.2.4

Summary Report for Summer Emissions (Pounds/Day)

File Name: C:\Documents and Settings\cls\Application Data\Urbemis\Version9a\Projects\Bribsane Operation DSPE.urb924

Project Name: Brisbane Baylands Operations DSP Entertainment Variant

Project Location: San Mateo County

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

Off-Road Vehicle Emissions Based on: OFFROAD2007

AREA SOURCE EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10	PM2.5	CO2
TOTALS (lbs/day, unmitigated)	289.94	63.95	56.67	0.00	0.18	0.18	79,057.60
TOTALS (lbs/day, mitigated)	289.94	63.95	56.67	0.00	0.18	0.18	79,057.60
Percent Reduction	0.00	0.00	0.00	NaN	0.00	0.00	0.00

OPERATIONAL (VEHICLE) EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10	PM2.5	CO2
TOTALS (lbs/day, unmitigated)	110.55	58.74	975.85	3.20	582.71	109.95	321,751.65
TOTALS (lbs/day, mitigated)	89.81	43.23	715.49	2.35	426.61	80.50	236,393.48
Percent Reduction	18.76	26.40	26.68	26.56	26.79	26.78	26.53

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SUM OF AREA SOURCE AND OPERATIONAL EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10	PM2.5	CO2
TOTALS (lbs/day, unmitigated)	400.49	122.69	1,032.52	3.20	582.89	110.13	400,809.25
TOTALS (lbs/day, mitigated)	379.75	107.18	772.16	2.35	426.79	80.68	315,451.08
Percent Reduction	5.18	12.64	25.22	26.56	26.78	26.74	21.30

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Urbemis 2007 Version 9.2.4

Summary Report for Winter Emissions (Pounds/Day)

File Name: C:\Documents and Settings\cls\Application Data\Urbemis\Version9a\Projects\Bribsane Operation DSPE.urb924

Project Name: Brisbane Baylands Operations DSP Entertainment Variant

Project Location: San Mateo County

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

Off-Road Vehicle Emissions Based on: OFFROAD2007

AREA SOURCE EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10	PM2.5	CO2
TOTALS (lbs/day, unmitigated)	290.02	88.24	50.10	0.16	2.10	2.08	110,325.52
TOTALS (lbs/day, mitigated)	290.02	88.24	50.10	0.16	2.10	2.08	110,325.52
Percent Reduction	0.00	0.00	0.00	0.00	0.00	0.00	0.00

OPERATIONAL (VEHICLE) EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10	PM2.5	CO2
TOTALS (lbs/day, unmitigated)	93.71	90.63	997.23	2.71	582.71	109.95	275,043.16
TOTALS (lbs/day, mitigated)	68.86	66.69	731.99	2.02	426.61	80.50	202,047.45
Percent Reduction	26.52	26.42	26.60	25.46	26.79	26.78	26.54

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SUM OF AREA SOURCE AND OPERATIONAL EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10	PM2.5	CO2
TOTALS (lbs/day, unmitigated)	383.73	178.87	1,047.33	2.87	584.81	112.03	385,368.68
TOTALS (lbs/day, mitigated)	358.88	154.93	782.09	2.18	428.71	82.58	312,372.97
Percent Reduction	6.48	13.38	25.33	24.04	26.69	26.29	18.94

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Urbemis 2007 Version 9.2.4

Detail Report for Summer Operational Unmitigated Emissions (Pounds/Day)

File Name: C:\Documents and Settings\cls\Application Data\Urbemis\Version9a\Projects\Bribsane Operation DSPE.urb924

Project Name: Brisbane Baylands Operations DSP Entertainment Variant

Project Location: San Mateo County

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

Off-Road Vehicle Emissions Based on: OFFROAD2007

OPERATIONAL EMISSION ESTIMATES (Summer Pounds Per Day, Unmitigated)

Source	ROG	NOX	CO	SO2	PM10	PM25	CO2
Apartments mid rise	25.34	11.15	189.16	0.61	111.09	20.98	61,625.40
Condo/townhouse general	4.24	2.21	37.54	0.12	22.05	4.16	12,231.15
Elementary school	1.20	0.31	5.12	0.02	3.08	0.58	1,696.05
High school	4.41	1.35	22.02	0.07	13.34	2.52	7,339.37
Hotel	9.30	5.62	91.19	0.30	55.46	10.46	30,474.50
Strip mall	10.95	7.75	125.43	0.42	76.46	14.41	41,986.68
General office building	21.98	12.06	200.87	0.66	119.71	22.59	66,129.80
Government (civic center)	3.80	2.67	43.57	0.14	26.40	4.98	14,521.70
General light industry	23.47	12.44	209.56	0.68	123.79	23.37	68,544.70
Movies/Theater	3.59	2.71	43.80	0.15	26.70	5.03	14,661.92
Arena	2.27	0.47	7.59	0.03	4.63	0.87	2,540.38
TOTALS (lbs/day, unmitigated)	110.55	58.74	975.85	3.20	582.71	109.95	321,751.65

Does not include correction for passby trips

Does not include double counting adjustment for internal trips

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Analysis Year: 2040 Temperature (F): 85 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
Apartments mid rise	103.95	1.92	dwelling units	3,950.00	7,584.00	64,840.92
Condo/townhouse general	30.25	3.11	dwelling units	484.00	1,505.24	12,869.35
Elementary school		0.77	students	300.00	231.00	1,797.18
High school		1.03	students	1,000.00	1,030.00	7,791.95
Hotel		6.04	rooms	719.00	4,342.76	32,386.13
Strip mall		21.34	1000 sq ft	283.00	6,039.22	44,647.95
General office building		3.83	1000 sq ft	2,252.00	8,625.16	69,885.36
Government (civic center)		19.98	1000 sq ft	102.00	2,037.96	15,417.17
General light industry		3.30	1000 sq ft	2,599.00	8,576.70	72,258.70
Movies/Theater		191.72	unknown	11.00	2,108.92	15,591.25
Arena		0.58	1000 sq ft	630.00	365.40	2,701.40
					42,446.36	340,187.36

Vehicle Fleet Mix

Vehicle Type	Percent Type	Non-Catalyst	Catalyst	Diesel
Light Auto	57.0	0.0	100.0	0.0
Light Truck < 3750 lbs	11.3	0.0	100.0	0.0
Light Truck 3751-5750 lbs	19.6	0.0	100.0	0.0
Med Truck 5751-8500 lbs	6.4	0.0	100.0	0.0

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Vehicle Fleet Mix

Vehicle Type	Percent Type	Non-Catalyst	Catalyst	Diesel
Lite-Heavy Truck 8501-10,000 lbs	0.8	0.0	87.5	12.5
Lite-Heavy Truck 10,001-14,000 lbs	0.6	0.0	66.7	33.3
Med-Heavy Truck 14,001-33,000 lbs	0.9	0.0	22.2	77.8
Heavy-Heavy Truck 33,001-60,000 lbs	0.0	0.0	0.0	0.0
Other Bus	0.1	0.0	0.0	100.0
Urban Bus	0.1	0.0	0.0	100.0
Motorcycle	2.8	32.1	67.9	0.0
School Bus	0.0	0.0	0.0	0.0
Motor Home	0.4	0.0	100.0	0.0

Travel Conditions

	Residential			Commercial		
	Home-Work	Home-Shop	Home-Other	Commute	Non-Work	Customer
Urban Trip Length (miles)	10.8	7.3	7.5	9.5	7.4	7.4
Rural Trip Length (miles)	16.8	7.1	7.9	14.7	6.6	6.6
Trip speeds (mph)	35.0	35.0	35.0	35.0	35.0	35.0
% of Trips - Residential	32.9	18.0	49.1			
% of Trips - Commercial (by land use)						
Elementary school				20.0	10.0	70.0
High school				10.0	5.0	85.0
Hotel				5.0	2.5	92.5

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Travel Conditions

	Residential			Commercial		
	Home-Work	Home-Shop	Home-Other	Commute	Non-Work	Customer
Strip mall				2.0	1.0	97.0
General office building				35.0	17.5	47.5
Government (civic center)				10.0	5.0	85.0
General light industry				50.0	25.0	25.0
Movies/Theater				2.0	1.0	97.0
Arena				2.0	1.0	97.0

Operational Changes to Defaults

Recology Trips

Trip Type	Existing	Future	Project Increment
Intercompany	1273	1527	254
Other	1910	2293	383
Emlpoyee	1120	1120	0
Visitor	28	28	0

EMFAC 2011
2030 Estimated Annual Emission Rates
EMFAC 2011 Vehicle Categories
San Francisco COUNTY
San Francisco Bay Area AIR BASIN
Bay Area AQMD

Area	CalYr	Season	Veh	Fuel	MdlYr	Speed (Miles/hr)	Pop (Vehicles)	VMT (Miles/day	Trips (Trips/day)	ROG_RUNE (gms/mile)	ROG_IDLEX (gms/vehic	ROG_STREX (gms/vehic
San Francis	2030	Annual	T7 SWCV	DSL	AllMYr	40	0	166.0233	0	0.138534	0	0

ROG_DIUR	ROG_HTSK	ROG_RUNL	ROG_RESTI	TOG_RUNE	TOG_IDLEX	TOG_STRE	TOG_DIURI	TOG_HTSK	TOG_RUNL	TOG_RESTI	CO_RUNEX	CO_IDLEX
(gms/vehic	(gms/vehic	(gms/mile)	(gms/vehic	(gms/mile)	(gms/vehic	(gms/vehic	(gms/vehic	(gms/vehic	(gms/mile)	(gms/vehic	(gms/mile)	(gms/vehic
0	0	0	0	0.15771	0	0	0	0	0	0	0.642377	0

CO_STREX	NOX_RUNE	NOX_IDLEX	NOX_STRE	CO2_RUNE	CO2_IDLEX	CO2_STRE	CO2_RUNE	CO2_IDLEX	CO2_STRE	PM10_RUN	PM10_IDLE	PM10_STR
(gms/vehic	(gms/mile)	(gms/vehic	(gms/vehic	(gms/mile)	(gms/vehic	(gms/vehic	(gms/mile)	(gms/vehic	(gms/vehic	(gms/mile)	(gms/vehic	(gms/vehic
0	1.862809	0	0	1678.34	0	0	1510.506	0	0	0.041262	0	0

PM10_PM	PM10_PMI	PM2_5_RU	PM2_5_IDI	PM2_5_STI	PM2_5_PM	PM2_5_PM	SOX_RUNE	SOX_IDLEX	SOX_STREX
(gms/mile)	(gms/mile)	(gms/mile)	(gms/vehic	(gms/vehic	(gms/mile)	(gms/mile)	(gms/mile)	(gms/vehic	(gms/vehicle/day)
0	0	0.037961	0	0	0	0	0	0	0

2035 Estimated Annual Emission Rates
EMFAC 2011 Vehicle Categories
San Francisco COUNTY
San Francisco Bay Area AIR BASIN
Bay Area AQMD

Area	CalYr	Season	Veh	Fuel	MdlYr	Speed	Pop	VMT	Trips	ROG_RUNE	ROG_IDLEX	ROG_STREX
						(Miles/hr)	(Vehicles)	(Miles/day	(Trips/day)	(gms/mile)	(gms/vehic	(gms/vehic
San Francis	2035	Annual	MDV	GAS	AllMYr	30	0	362118	0	0.019082	0	0
San Francis	2035	Annual	MDV	DSL	AllMYr	30	0	737.3075	0	0.007032	0	0
50% Composite										0.013057		

ROG_DIUR	ROG_HTSK	ROG_RUNL	ROG_RESTI	TOG_RUNE	TOG_IDLEX	TOG_STRE	TOG_DIURI	TOG_HTSK	TOG_RUNL	TOG_RESTI	CO_RUNEX	CO_IDLEX
(gms/vehic	(gms/vehic	(gms/mile)	(gms/vehic	(gms/mile)	(gms/vehic	(gms/vehic	(gms/vehic	(gms/vehic	(gms/mile)	(gms/vehic	(gms/mile)	(gms/vehic
0	0	0	0	0.032922	0	0	0	0	0	0	1.056564	0
0	0	0	0	0.008005	0	0	0	0	0	0	0.079838	0
											0.568201	

CO_STREX	NOX_RUNE	NOX_IDLEX	NOX_STRE	CO2_RUNE	CO2_IDLEX	CO2_STRE	CO2_RUNE	CO2_IDLEX	CO2_STRE	PM10_RUN	PM10_IDLE	PM10_STR
(gms/vehic	(gms/mile)	(gms/vehic	(gms/vehic	(gms/mile)	(gms/vehic	(gms/vehic	(gms/mile)	(gms/vehic	(gms/vehic	(gms/mile)	(gms/vehic	(gms/vehic
0	0.104033	0	0	614.8392	0	0	433.3143	0	0	0.002227	0	0
0	0.236398	0	0	281.2077	0	0	196.0342	0	0	0.004261	0	0
	0.170216			448.0234			314.6742			0.003244		

PM10_PM	PM10_PMI	PM2_5_RU	PM2_5_IDI	PM2_5_STI	PM2_5_PM	PM2_5_PM	SOX_RUNE	SOX_IDLEX	SOX_STREX
(gms/mile)	(gms/mile)	(gms/mile)	(gms/vehic	(gms/vehic	(gms/mile)	(gms/mile)	(gms/mile)	(gms/vehic	(gms/vehicle/day)
0	0	0.002066	0	0	0	0	0	0	0
0	0	0.00392	0	0	0	0	0	0	0
		0.002993							

Recology Emissions - Waste Collection

Average trip Length = 10 miles

Mileage travelled in SFBAAB: 2540 miles/year

Truck percentage on 101 ay 3rd Street 0.046 or less per Caltrans 2007
Average vehicle weight for entrained road dust calc = 3.288

EMFAC2011 emission factors for HDD trucks:	ROG	NOx	PM10	CO	PM2.5		CO2	CH4	N2O	
Assumptions:	0.138534	1.862809	0.041262	0.642377	0.037961	(gm/mile)	1510.506	0.0051	0.0048	Emisssion factors for CH4 andNO2 from CCAR Protocol Table C4
30 mph ave										
Analysis Year 2035										
Roadway Fugitive Dust Factor			0.001143	(Lb/VMT)						
Fugitive road dust =			0.01	Lb/day						
Emissions =	0	5	0	2	0.1	(kg/yr)	3837	0	0	kg/yr
	1	10	0	4	0	(lb/year)				
	0.00	**0.03**	**0.00**	**0.01**	**0.00**	**Pounds/day**				
	0.00	0.01	0.00	0.00	0.000106	Tons/Year	4.22	1.42E-05	1.34E-05	ton/yr
							3.83	1.29E-05	1.22E-05	Metric tons/yr
BAAQMD Threshold	54	54	82	550	54	**Pounds/day**				
						GWP =	1	21	310	(GWP from IPCC 2nd Assessment Report per CCAR 2009)
						eCO2 =	3.827861	0.000271	0.003771	Metric tons/yr
							3.831904			

Recology Emissions - Drop off

Average trip Length = 10 miles

Mileage travelled in SFBAAB: 3830 miles/year

Truck percentage on 101 ay 3rd Street 0.046 or less per Caltrans 2007
Average vehicle weight for entrained road dust calc = 3.288

EMFAC2011 emission factors for HDD trucks:	ROG	NOx	PM10	CO	PM2.5		CO2	CH4	N2O	
Assumptions:	0.013057	0.170216	0.003244	0.568201	0.002993	(gm/mile)	314.6742	0.0051	0.0048	Emisssion factors for CH4 andNO2 from CCAR Protocol Table C4
30 mph ave										
Analysis Year 2035										
Roadway Fugitive Dust Factor			0.001143	(Lb/VMT)						
Fugitive road dust =			0.01	Lb/day						
Emissions =	0	1	0	2	0.0	(kg/yr)	1205	1.95E-02	1.84E-02	kg/yr
	0	1	0	5	0	(lb/year)				
	3.01E-04	**3.93E-03**	**7.49E-05**	**1.31E-02**	**6.91E-05**	**Pounds/day**				
	5.50E-05	7.17E-04	1.37E-05	2.39E-03	1.26E-05	Tons/Year	1.33	2.15E-05	2.02E-05	ton/yr
							1.20	1.95E-05	1.83E-05	Metric tons/yr
BAAQMD Threshold	54	54	82	550	54	**Pounds/day**				
						GWP =	1	21	310	(GWP from IPCC 2nd Assessment Report per CCAR 2009)
						eCO2 =	1.20243	0.000409	0.005686	Metric tons/yr
						eCO2 =	**1.208526**			**1 Metric tons/yr**

Recology Transport Trips

Truck Trips = 35 (311 future less 276 existing) per tables 5 and 6 of Recology trip study

				Percent trips
Destinations =	Organics > Vacaviile (end of basin)	65	miles	18.00%
	MSW >Yuba County (end of basin)	65	miles	31.00%
	Commodities>End of air basin	65	miles	31.00%
	Pier 96	4	miles	20.00%

days per year = 240

35 one way truck trips/day
8400 oneway trips/yr
Average trip Length = 52.8 miles

Mileage travelled in SFBAAB: 443520 miles/year

Truck percentage on 101 ay 3rd Street 0.046 or less per Caltrans 2007
Average vehicle weight for entrained road dust calc = 3.288

EMFAC2011 emission factors for HDD trucks:	ROG	NOx	PM10	CO	PM2.5		CO2	CH4	N2O	
Assumptions:	0.138534	1.862809	0.041262	0.642377	0.037961	(gm/mile)	1678.34	0.0051	0.0048	Emisssion factors for CH4 andNO2 from CCAR Protocol Table C4
40 mph ave										
Analysis Year 2020										
Roadway Fugitive Dust Factor			0.001143	(Lb/VMT)						
Fugitive road dust =			1.39	Lb/day						
Emissions =	61	826	18	285	16.8	(kg/yr)	744377	2	2	kg/yr
	135	1818	40	627	37	(lb/year)				
	0.37	**4.98**	**0.11**	**1.72**	**0.10**	**Pounds/day**				
	0.07	0.91	0.02	0.31	0.01852	Tons/Year	818.82	0.00	0.00	ton/yr
							742.67	0.00	0.00	Metric tons/yr
BAAQMD Threshold	54	54	82	550	54	**Pounds/day**				

GWP =	1	21	310	(GWP from IPCC 2nd Assessment Report per CCAR 2009)
eCO2 =	742.6654	0.047392	0.65844	Metric tons/yr
eCO2 =	**743.3712**			**743 Metric tons/yr**

EMFAC 2011
2030 Estimated Annual Emission Rates
EMFAC 2011 Vehicle Categories
San Francisco COUNTY
San Francisco Bay Area AIR BASIN
Bay Area AQMD

Area	CalYr	Season	Veh	Fuel	MdlYr	Speed (Miles/hr)	Pop (Vehicles)	VMT (Miles/day	Trips (Trips/day)	ROG_RUNE (gms/mile)	ROG_IDLEX (gms/vehic	ROG_STREX (gms/vehic
San Francis	2030	Annual	T7 SWCV	DSL	AllMYr	40	0	166.0233	0	0.138534	0	0

ROG_DIUR	ROG_HTSK	ROG_RUNL	ROG_RESTI	TOG_RUNE	TOG_IDLEX	TOG_STRE	TOG_DIURI	TOG_HTSK	TOG_RUNL	TOG_RESTI	CO_RUNEX	CO_IDLEX
(gms/vehic	(gms/vehic	(gms/mile)	(gms/vehic	(gms/mile)	(gms/vehic	(gms/vehic	(gms/vehic	(gms/vehic	(gms/mile)	(gms/vehic	(gms/mile)	(gms/vehic
0	0	0	0	0.15771	0	0	0	0	0	0	0.642377	0

CO_STREX	NOX_RUNE	NOX_IDLEX	NOX_STRE	CO2_RUNE	CO2_IDLEX	CO2_STRE	CO2_RUNE	CO2_IDLEX	CO2_STRE	PM10_RUN	PM10_IDLE	PM10_STR
(gms/vehic	(gms/mile)	(gms/vehic	(gms/vehic	(gms/mile)	(gms/vehic	(gms/vehic	(gms/mile)	(gms/vehic	(gms/vehic	(gms/mile)	(gms/vehic	(gms/vehic
0	1.862809	0	0	1678.34	0	0	1510.506	0	0	0.041262	0	0

PM10_PM	PM10_PMI	PM2_5_RU	PM2_5_IDI	PM2_5_STI	PM2_5_PM	PM2_5_PM	SOX_RUNE	SOX_IDLEX	SOX_STREX
(gms/mile)	(gms/mile)	(gms/mile)	(gms/vehic	(gms/vehic	(gms/mile)	(gms/mile)	(gms/mile)	(gms/vehic	(gms/vehicle/day)
0	0	0.037961	0	0	0	0	0	0	0

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

              JOB: Brisbane Geneva Bayshore  Cum + EV Event
              RUN: Hour 1
        POLLUTANT: Carbon Monoxide


  I.  SITE VARIABLES

        U=    .5 M/S              Z0= 100. CM            ALT=     0. (M)
      BRG=  90.0 DEGREES          VD=   .0 CM/S
     CLAS=     7 (G)              VS=   .0 CM/S
     MIXH= 1000. M               AMB=  5.7 PPM
    SIGTH=   10. DEGREES        TEMP=  4.4 DEGREE (C)


  II.  LINK VARIABLES

      LINK      *  LINK COORDINATES (M)   *              EF     H     W
   DESCRIPTION  *   X1    Y1    X2    Y2  * TYPE  VPH  (G/MI)  (M)   (M)
 ----------------*-------------------------*-------------------------------
 A. Link A       *     0   200     0  -200 *  AG   2666   1.0     .0  10.0
 B. Link B       *   -20   200   -20  -200 *  AG   1830   1.0     .0  10.0
 C. Link C       *  -200     0   200     0 *  AG   3455   1.0     .0  10.0
 D. Link D       *  -200   -20   200   -20 *  AG   3024   1.0     .0  10.0


 III.  RECEPTOR LOCATIONS

            *    COORDINATES (M)
  RECEPTOR  *    X      Y      Z
 ------------*--------------------
 1. Recpt 1  *    -35     15   1.8
 2. Recpt 2  *     15     15   1.8
 3. Recpt 3  *    -35    -35   1.8
 4. Recpt 4  *     15    -35   1.8


  IV.  MODEL RESULTS (PRED. CONC. INCLUDES AMB.)

            * PRED  *      CONC/LINK
            * CONC  *        (PPM)
  RECEPTOR  * (PPM) *   A    B    C    D
-------------*-------*--------------------
 1. Recpt 1  *   5.9 *   .0   .0   .0   .0
 2. Recpt 2  *   5.8 *   .0   .0   .0   .0
 3. Recpt 3  *   5.9 *   .0   .0   .0   .0
 4. Recpt 4  *   5.7 *   .0   .0   .0   .0
```

♀◘

DPM emissions from operations - Brisbane Baylands

CPP Scenario PM2.5 emissions = 36.58 TPY

Truck type	Percent type	percent diesel	DPM Emissions
LHT1	0.80%	12.50%	0.03658
LHT2	0.60%	33.30%	0.073087
MHT	0.90%	77.80%	0.256133
Bus	0.10%	100.00%	0.03658
Bus	0.10%	100.00%	0.03658
		Total	0.43896 TPY

CPP Recology Scenario PM2.5 emissions = 34.93 TPY DOES NOT INCLUDE RECOLOGY TRAFFIC

Truck type	Percent type	percent diesel	DPM Emissions
LHT1	0.80%	12.50%	0.03493
LHT2	0.60%	33.30%	0.06979
MHT	0.90%	77.80%	0.24458
Bus	0.10%	100.00%	0.03493
Bus	0.10%	100.00%	0.03493
		Total	0.41916 TPY

DSP Scenario PM2.5 emissions = 21.28 TPY

Truck type	Percent type	percent diesel	DPM Emissions
LHT1	0.80%	12.50%	0.02128
LHT2	0.60%	33.30%	0.042517
MHT	0.90%	77.80%	0.149003
Bus	0.10%	100.00%	0.02128
Bus	0.10%	100.00%	0.02128
		Total	0.25536 TPY

DSPE Scenario PM2.5 emissions = 20.26 TPY

Truck type	Percent type	percent diesel	DPM Emissions
LHT1	0.80%	12.50%	0.02026
LHT2	0.60%	33.30%	0.040479
MHT	0.90%	77.80%	0.141861
Bus	0.10%	100.00%	0.02026
Bus	0.10%	100.00%	0.02026
		Total	0.24312 TPY

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D.3
Health Risk Analysis

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Brisbane Baylands
Health Risk Assessment

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March 29, 2012

Health Risk Assessment

A health risk assessment (HRA) is accomplished in four steps; hazards identification, exposure assessment, toxicity assessment, and risk characterization. These steps cover the estimation of air emissions, the estimation of the air concentrations resulting from a dispersion analysis, the incorporation of the toxicity of the pollutants emitted, and the characterization of the risk based on exposure parameters such as breathing rate, age adjustment factors, and exposure duration; each depending on receptor type.

The HRA was conducted in accordance with technical guidelines developed by federal, state, and regional agencies, including US Environmental Protection Agency (USEPA), California Environmental Protection Agency (CalEPA), California Office of Environmental Health Hazard Assessment (OEHHA) *Air Toxics Hot Spots Program Guidance*[1], and the BAAQMD's *Health Risk Screening Analysis Guidelines*.[2]

According to CalEPA, a HRA should not be interpreted as the expected rates of cancer or other potential human health effects, but rather as estimates of potential risk or likelihood of adverse effects based on current knowledge, under a number of highly conservative assumptions and the best assessment tools currently available.

TERMS AND DEFINITIONS

As the practice of conducting a HRA is particularly complex and involves concepts that are not altogether familiar to most people, several terms and definitions are provided that are considered essential to the understanding of the approach, methodology and results:

> *Acute effect* – a health effect (non-cancer) produced within a short period of time (few minutes to several days) following an exposure to toxic air contaminants (TAC).
>
> *Cancer risk* – the probability of an individual contracting cancer from a lifetime (i.e., 70 year) exposure to TAC in the ambient air.
>
> *Chronic effect* – a health effect (non-cancer) produced from a continuous exposure occurring over an extended period of time (weeks, months, years).
>
> *Hazard Index (HI)* – the unitless ratio of an exposure level over the acceptable reference dose (RfC). The HI can be applied to multiple compounds in an additive manner.
>
> *Hazard Quotient (HQ)* – the unitless ratio of an exposure level over the acceptable reference dose (RfC). The HQ is applied to individual compounds.
>
> *Toxic air contaminants (TAC)* – any air pollutant that is capable of causing short-term (acute) and/or long-term (chronic or carcinogenic, i.e., cancer causing) adverse human health effects (i.e., injury or illness). The current California list of TAC lists approximately 200 compounds, including particulate emissions from diesel-fueled engines.

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[1] Office of Environmental Health Hazard Assessment (OEHHA), 2003. *Air Toxics Hot Spots Program Guidance Manual for Preparation of Health Risk Assessments*, http://www.oehha.org/air/hot_spots/pdf/HRAguidefinal.pdf

[2] Bay Area Air Quality Management District (BAAQMD), 2005. *BAAQMD Health Risk Screening Analysis Guidelines (http://www.baaqmd.gov/pmt/air_toxics/risk_procedures_policies/hrsa_guidelines.pdf)*, June 2005.

Human Health Effects - comprise disorders such as eye watering, respiratory or heart ailments, and other (i.e., non-cancer) related diseases.

Health Risk Assessment (HRA) – an analysis designed to predict the generation and dispersion of TAC in the outdoor environment, evaluate the potential for exposure of human populations, and to assess and quantify both the individual and population-wide health risks associated with those levels of exposure.

Incremental – under CEQA, the net difference (or change) in conditions or impacts when comparing the baseline to future year project conditions.

Maximum exposed individual (MEI) – an individual assumed to be located at the point where the highest concentrations of TAC, and therefore, health risks are predicted to occur.

Non-cancer risks – health risks such as eye watering, respiratory or heart ailments, and other non-cancer related diseases.

Receptors – the locations where potential health impacts or risks are predicted (schools, residences and work-sites).

LIMITATIONS AND UNCERTAINTIES

There are a number of important limitations and uncertainties commonly associated with a HRA due to the wide variability of human exposures to TACs, the extended timeframes over which the exposures are evaluated and the inability to verify the results. Among these challenges are the following:

- The HRA exposure estimates do not take into account that people do not usually reside at the same location for 70 years and that other exposures (i.e., school children) are also of much shorter durations than was assumed in this analysis. Therefore, the results of the HRA are highly overstated for those cases.

- Other limitations and uncertainties associated with HRA and identified by the CalEPA include: (a.) lack of reliable monitoring data; (b.) extrapolation of toxicity data in animals to humans; (c.) estimation errors in calculating TACs emissions; (d.) concentration prediction errors with dispersion models; and (e.) the variability in lifestyles, fitness and other confounding factors of the human population.

HAZARDS IDENTIFICATION

TAC emissions associated with the project would occur from the following project activities:

- Off-road equipment and haul trucks during construction activities
- Motor vehicle operations along nearby roadways

Diesel exhaust is a complex mixture of numerous individual gaseous and particulate compounds emitted from diesel-fueled combustion engines diesel particulate matter (DPM) is formed primarily through the incomplete combustion of diesel fuel. DPM is removed from the atmosphere through physical processes including atmospheric fall-out and washout by rain. Humans can be exposed to airborne DPM by deposition on water, soil, and vegetation; although the main pathway of exposure is inhalation.

In August 1998, the California Air Resource Board (CARB) identified DPM as a TAC. The CARB developed *Risk Reduction Plan to Reduce Particulate Matter Emissions from Diesel- Fueled Engines and Vehicles* and *Risk Management Guidance for the Permitting of New Stationary Diesel-Fueled Engines* and approved these documents on September 28, 2000. The documents represent proposals to reduce DPM emissions, with the goal of reducing emissions and the associated health risk by 75 percent in 2010 and by 85 percent in 2020. The program aimed to require the use of state-of-the-art catalyzed DPM filters and ultra-low-sulfur diesel fuel.

In 2001, CARB assessed the state-wide health risks from exposure to diesel exhaust and to other toxic air contaminants. It is difficult to distinguish the health risks of diesel emissions from those of other air toxics, since diesel exhaust contains approximately 40 different TACs. The CARB study detected diesel exhaust by using ambient air carbon soot measurements as a surrogate for diesel emissions. The study reported that the state-wide cancer risk from exposure to diesel exhaust was about 540 per million population as compared to a total risk for exposure to all ambient air toxics of 760 per million. This estimate, which accounts for about 70 percent of the total risk from TACs, included both urban and rural areas in the state. The estimate can also be considered an average worst-case for the state, since it assumes constant exposure to outdoor concentrations of diesel exhaust and does not account for expected lower concentrations indoors, where most of time is spent.

EXPOSURE ASSESSMENT

Dispersion is the process by which atmospheric pollutants circulate due to wind and vertical stability. The results of a dispersion analysis are used to assess pollutant concentrations at or near an emission source. The results of this analysis allow predicted concentrations of pollutants to be compared directly to air quality standards and other criteria such as health risks.

Dispersion Modeling Approach

This section presents the methodology used for the dispersion modeling analysis. This section addresses all of the fundamental components of an air dispersion modeling analysis including:

- Model selection and options
- Receptor locations
- Meteorological data
- Source release characteristics

Model Selection and Options

The AERMOD (Version 11353) was used for the dispersion analysis. AERMOD is the US EPA preferred dispersion model for general industrial sources. The model can simulate point, area, volume, and line sources. The AERMOD model is the appropriate model for this analysis based on the coverage of simple, intermediate, and complex terrain. It also predicts both short-term and long-term (annual) average concentrations. The model was executed using the regulatory default options (stack-tip downwash, buoyancy-induced dispersion, and final plume rise), default wind speed profile categories, default potential temperature gradients, and no pollutant decay.

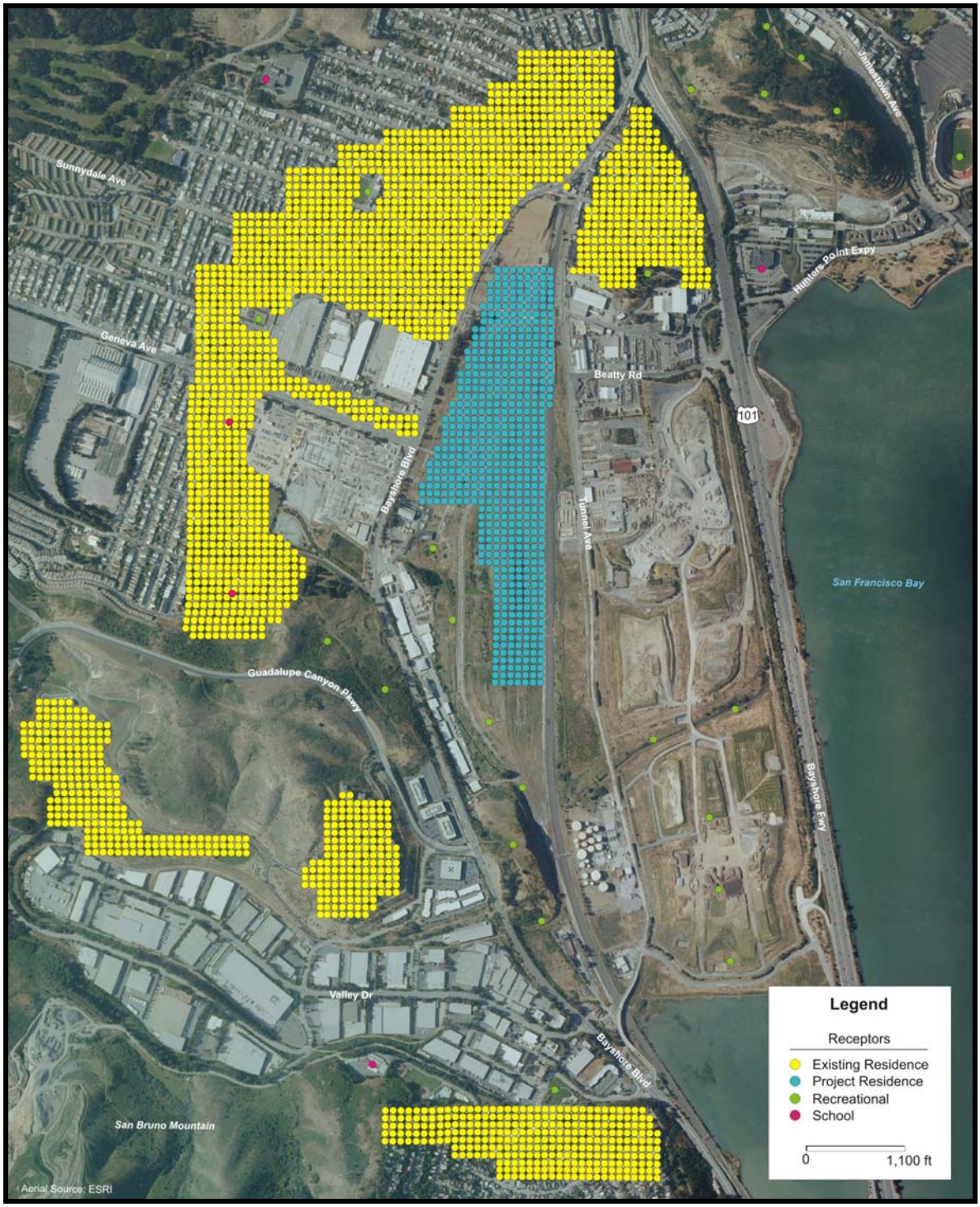
The selection of the appropriate dispersion coefficients depends on the land use within three kilometers (km) of the project site. The land use typing was based on the classification method defined by Auer (1978); using pertinent United States Geological Survey (USGS) 1:24,000 scale (7.5 minute) topographic maps of the area. If the Auer land use types of heavy industrial, light-to-moderate industrial, commercial, and compact residential account for 50 percent or more of the total area, the US EPA *Guideline on Air Quality Models* recommends using urban dispersion coefficients; otherwise, the appropriate rural coefficients were used. Based on observation of the area surrounding the project site, rural (urban is only designated within dense city centers such as San Francisco) dispersion coefficients were applied in the analysis.

Receptors

Some receptors are considered more sensitive to air pollutants than others, because of preexisting health problems, proximity to the emissions source, or duration of exposure to air pollutants. Land uses such as primary and secondary schools, hospitals, and convalescent homes are considered to be relatively sensitive to poor air quality because the very young, the old, and the infirm are more susceptible to respiratory infections and other air quality-related health problems than the general public. Residential areas are also considered sensitive to poor air quality because people in residential areas are often at home for extended periods. Recreational land uses are moderately sensitive to air pollution, because vigorous exercise associated with recreation places a high demand on respiratory system function.

The closest residential uses are approximately 150 feet east of the project site, along Geneva Avenue and near Bayshore Boulevard. Additional residences are to the northeast (along Blanken Avenue and Lathrop Avenue) and to the southwest within Brisbane. Eight schools were included in the analysis as well as 23 recreational receptors. Nearly 3,150 receptors were included in the analysis. Terrain elevations for receptor locations were used (i.e., complex terrain) based on available USGS information for the area. Receptors were placed at a height of 1.8 meters (typical breathing height). **Exhibit 1** displays the location of the receptors used in the HRA.

EXHIBIT 1
HEALTH RISK ASSESSMENT RECEPTORS

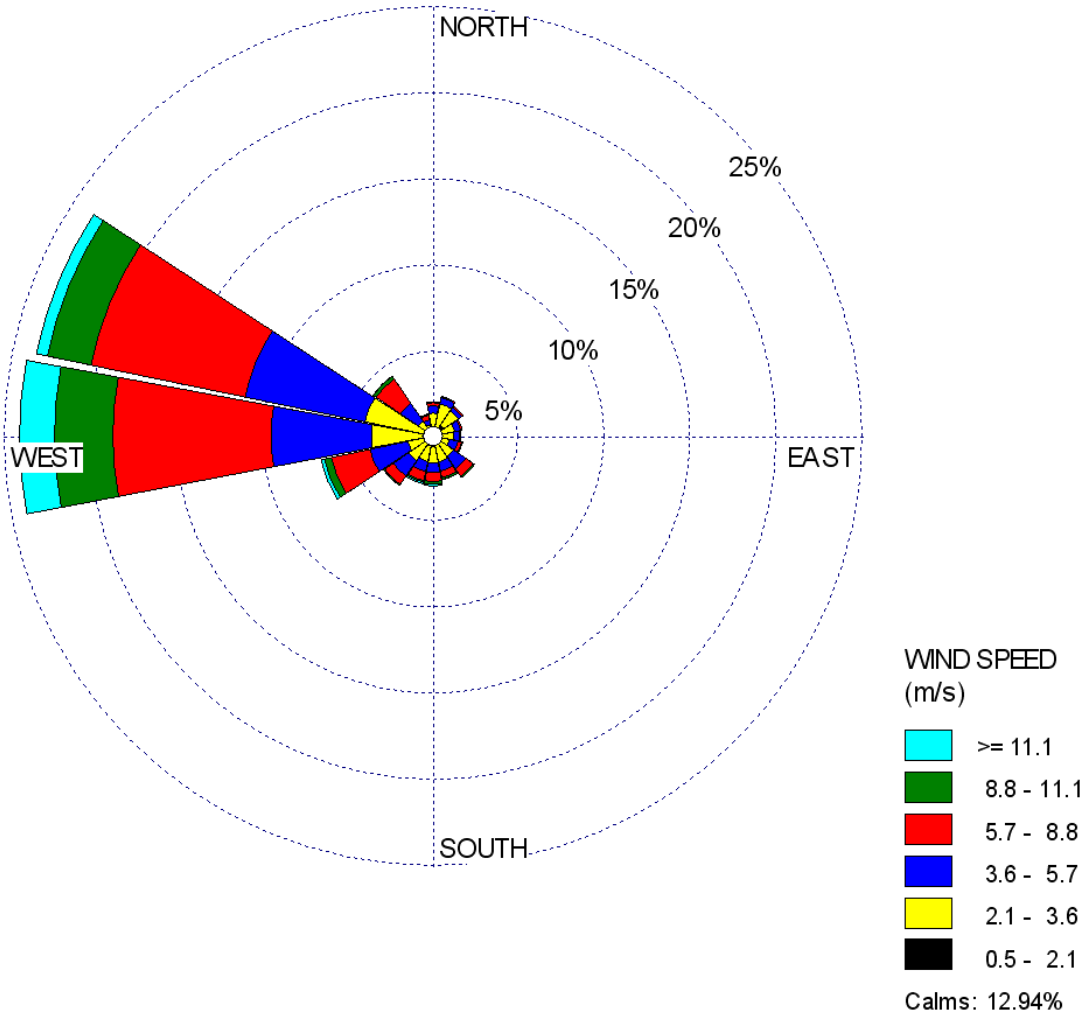


Meteorological Data

Air quality is a function of both the rate and location of pollutant emissions under the influence of meteorological conditions and topographic features affecting pollutant movement and dispersal. Atmospheric conditions such as wind speed, wind direction, atmospheric stability, and air temperature gradients interact with the physical features of the landscape to determine the movement and dispersal of air pollutants, and consequently affect air quality.

Hourly surface meteorological data and upper air meteorological data from San Francisco and Oakland, California, respectively, were provided by BAAQMD and used for the modeling analysis and. **Exhibit 2** provides the annual wind roses for the meteorological station. Wind directions are predominately from the south southwest and there is a low frequency of calm wind conditions.

EXHIBIT 2
WINDROSE FOR SAN FRANCISCO, CALIFORNIA



Source Release Characteristics

Construction equipment was treated as an area source within the facility expansion area. The release height of the off-road equipment exhaust was 3.05 meters. Delivery trucks and employee trips were treated as a line source (i.e., volume sources placed at regular intervals) located along the access road. The delivery trucks were assigned a release height of 3.05 meters and an initial vertical dimension of 4.15 meters, which accounts for dispersion from the movement of vehicles.

Terrain elevations for emission source locations were used (i.e., complex terrain) based on available USGS DEM for the area. AERMAP (Version 11103) was used to develop the terrain elevations, although the project site is generally flat.

Emission Estimates

The emissions associated with the HRA were based on the air quality calculations using URBEMIS (version 9.2.4) and the information within the project description regarding construction schedule and project operations.

Phase I of the project would occur between 2014 and 2019 and Phase II would occur between 2020 and 2026. Construction equipment and materials staging would be accommodated mostly on the Project Site. During Phase I haul truck trips would occur to transport soil from the railroad area (approximate travel trip distance of 1.25 miles). During Phase II haul truck trips would occur to transport materials to the Ox Mountain landfill (approximate travel trip distance of 22.5 miles).

Tables 1 through 4 show the estimated DPM construction emissions for the Phase I and II offroad equipment and haul trucks for each of the four alternatives. Haul truck emissions represent values within the modeling domain, approximately 2.8 miles for Ox Mountain trips and 2.2 miles for railroad area trips.

TABLE 1
DPM EMISSION ESTIMATES DURING CONSTRUCTION (TONS PER YEAR)

DEVELOPER-SPONSORED PROJECT

	Offroad Equipment		Haul Trucks	
Year	**Phase I**	**Phase II**	**Railroad**	**Ox Mountain**
2014	0.28		0.01	
2015	0.25		0.01	
2016	0.23		0.01	
2017	0.29		0.01	
2018	0.08		0.01	
2019	0.03		0.01	
2020		0.14		0.02
2021		0.32		0.02
2022		0.32		0.02
2023		0.38		0.02
2024		0.07		0.02
2025		0.07		0.02
2026		0.03		0.02

TABLE 2
DPM EMISSION ESTIMATES DURING CONSTRUCTION (TONS PER YEAR)

DEVELOPER-SPONSORED PROJECT (ENTERAINMENT VARIANT

	Offroad Equipment		Haul Trucks	
Year	**Phase I**	**Phase II**	**Railroad**	**Ox Mountain**
2014	0.28		0.01	
2015	0.25		0.01	
2016	0.23		0.01	
2017	0.29		0.01	
2018	0.08		0.01	
2019	0.03		0.01	
2020		0.18		0.02
2021		0.97		0.02
2022		0.96		0.02
2023		1.03		0.02
2024		0.07		0.02
2025		0.07		0.02
2026		0.03		0.02

TABLE 3
DPM EMISSION ESTIMATES DURING CONSTRUCTION (TONS PER YEAR)

COMMUNITY PREFERRED PLAN

	Offroad Equipment		Haul Trucks	
Year	**Phase I**	**Phase II**	**Railroad**	**Ox Mountain**
2014	0.25		0.01	
2015	0.38		0.01	
2016	0.35		0.01	
2017	0.40		0.01	
2018	0.08		0.01	
2019	0.03		0.01	
2020		0.14		0.02
2021		0.28		0.02
2022		0.28		0.02
2023		0.35		0.02
2024		0.07		0.02
2025		0.07		0.02
2026		0.03		0.02

TABLE 4
DPM EMISSION ESTIMATES DURING CONSTRUCTION (TONS PER YEAR)

COMMUNITY PREFERRED PLAN (RECOLOGY VARIANT)

	Offroad Equipment		Haul Trucks	
Year	**Phase I**	**Phase II**	**Railroad**	**Ox Mountain**
2014	0.25		0.01	
2015	0.38		0.01	
2016	0.35		0.01	
2017	0.40		0.01	
2018	0.08		0.01	
2019	0.03		0.01	
2020		0.14		0.02
2021		0.27		0.02
2022		0.27		0.02
2023		0.34		0.02
2024		0.07		0.02
2025		0.07		0.02
2026		0.03		0.02

Table 5 and 6 shows the data used to estimate the DPM operational emissions. Operational emissions represent values within the modeling domain, approximately 2.7 miles of roadway length, emission factors during the operational period, a percent DPM to $PM_{2.5}$ emissions, and the URBEMIS2007 $PM_{2.5}$ exhaust emissions for each alternative. Operational impacts from Caltrains, passing through the project site and the Bayshore Station, were included.[3] Emissions were based on USEPA's *Emission Factors for Locomotives* (dated December 1997). The health impacts were based on 96 trips per day for an existing total of 32 tons per year of DPM emissions and 2 tons per year by 2035 within the Caltrains route (approximately 52 miles).[4]

TABLE 5
PM2.5 EXHUAST EMISSIONS (TONS PER YEAR) AND ROUND TRIP DISTANCE (MILES)

Alternative	PM2.5 Exhaust Emissions	Round Trip Distance
Developer-Sponsored Project	3.10	16.12
Developer-Sponsored Project with Entertainment Variant	2.94	16.12
Community-Preferred Plan	5.29	15.09
Community-Preferred Plan with Recology Variant	5.04	15.09

TABLE 6
DPM EMISSION ESTIMATE PARAMETERS

Year	DPM Emission Factor (g/mile)	% DPM of PM2.5
2020	0.117	21%
2025	0.102	18%
2030	0.093	17%
2035	0.089	15%
2040	0.084	15%

Dispersion Modeling Results

Using AERMOD, the maximum 1-hour and average annual concentrations were determined for the emission sources of concern. These concentrations were estimated for a unit emission rate (1 gram per second) and adjusted based on the calculated project-related emission rate.

TOXICITY ASSESSMENT

The HRA was conducted following methodologies in BAAQMD's *Health Risk Screening Analysis Guidelines*[5] and in the California Office of Environmental Health Hazard Assessment (OEHHA) *Air Toxics Hot Spots Program Guidance.*[6] This was accomplished by applying the highest estimated concentrations at the receptors analyzed to the established cancer risk estimates and acceptable reference concentrations (RfC) for non-cancer health effects.

The toxicity values used in this analysis were based on OEHHA guidance. These toxicity values are for carcinogenic effects and acute/chronic health impacts. The primary pathway for exposures

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[3] A proposed Caltrain electrification project would convert the Caltrain mainline between San Francisco and San Jose from the current diesel-electric locomotive power source to a fully electric rolling stock. Electrification would reduce pollution. Caltrain planned to complete electrification by 2015 for the first phase and 2020 for the second phase.

[4] Caltrains Electrification Program, Final Environmental Assessment/Environmental Impact Statement, July 2009.

[5] Bay Area Air Quality Management District (BAAQMD), 2005. *BAAQMD Health Risk Screening Analysis Guidelines* (*http://www.baaqmd.gov/pmt/air_toxics/risk_procedures_policies/hrsa_guidelines.pdf*), June 2005.

[6] Office of Environmental Health Hazard Assessment (OEHHA), 2003. *Air Toxics Hot Spots Program Guidance Manual for Preparation of Health Risk Assessments*, http://www.oehha.org/air/hot_spots/pdf/HRAguidefinal.pdf

was assumed to be inhalation and carcinogenic and non-carcinogenic effects were evaluated separately. The incremental risks were determined for each emission source of TAC and summed to obtain an estimated total incremental carcinogenic health risk.

The 80th percentile adult breathing rate of 302 L/kg-day was used to determine cancer risks to residents from exposure to TAC. The residential exposure frequency and duration was assumed to be 350 days per year and 70 years. For children, OEHHA recommends assuming a breathing rate of 581 L/kg-day to assess potential risk via the inhalation exposure pathway. This value represents the upper 95th percentile of daily breathing rates for children. The modeled TAC concentrations were used to represent the exposure concentrations in the air. The inhalation absorption factor was assumed to be 1.

Cancer risk estimates also incorporate age sensitivity factors (ASFs). This approach provides updated calculation procedures that factor in the increased susceptibility of infants and children to carcinogens as compared to adults. OEHHA recommends that cancer risks be weighted by a factor of 10 for exposures that occur from the third trimester of pregnancy to 2 years of age, and by a factor of 3 for exposures from 2 years through 15 years of age. For estimating cancer risks for residential receptors over a 70 year lifetime, the incorporation of the ASFs results in a cancer risk adjustment factor (CRAF) of 1.7.

Based on OEHHA recommendations, the cancer risk to residential receptors assumes exposure occurs 24 hours per day for 350 days per year. For children at school sites, exposure is assumed to occur 10 hours per day for 180 days (or 36 weeks) per year. Cancer risk to residential receptors based on a 70-year lifetime exposure. Cancer risk estimates for children at school sites are calculated based on 9 year exposure duration.

Table 7 provides a summary of the risk assessment exposure parameters used in the analysis.

TABLE 7
HEALTH RISK ASSESSMENT EXPOSURE PARAMETERS

Receptor	Breathing Rate (DBR)	Cancer Risk Adjustment Factor (CRAF)	Daily Exposure	Annual Exposure	Exposure Duration (ED)
Adult	302	1.7	24 hours	350 days	70 years
Child	581	10	24 hours	350 days	3 years
School	581	3	10 hours	180 days	9 years

RISK CHARACTERIZATION

Cancer risk is defined as the lifetime probability of developing cancer from exposure to carcinogenic substances. Cancer risks are expressed as the chance in one million of getting cancer (i.e., number of cancer cases among one million people exposed). The cancer risks are assumed to occur exclusively through the inhalation pathway. The cancer risk can be estimated by using the cancer potency factor (milligrams per kilogram of body weight per day [mg/kg-day]), the 70-year annual average concentration (microgram per cubic meter [$\mu g/m^3$]), and the lifetime exposure adjustment.

Following guidelines established by OEHHA, the incremental cancer risks attributable to the project were calculated by applying exposure parameters to modeled TAC concentrations in order

to determine the inhalation dose (mg/kg-day) or the amount of pollutants inhaled per body weight mass per day. The cancer risks occur exclusively through the inhalation pathway; therefore, the cancer risks can be estimated from the following equation:

$$\text{Dose-inh} = \frac{C_{air} * \{DBR\} * A * CRAF * EF * ED * 10^{-6}}{AT}$$

Where:

Dose-inh	= Dose of the toxic substance through inhalation in mg/kg-day
10^{-6}	= Micrograms to milligrams conversion, Liters to cubic meters conversion
C_{air}	= Concentration in air (microgram (μg)/cubic meter (m^{3}))
{DBR}	= Daily breathing rate (liter (L)/kg body weight – day)
A	= Inhalation absorption factor
CRAF	= Cancer Risk Adjustment Factor, Age Sensitivity Factor
EF	= Exposure frequency (days/year)
ED	= Exposure duration (years)
AT	= Averaging time period over which exposure is averaged in days (25,550 days for a 70 year cancer risk)

To determine incremental cancer risk, the estimated inhalation dose attributed to the project was multiplied by the cancer potency slope factor (cancer risk per mg/kg-day). The cancer potency slope factor is the upper bound on the increased cancer risk from a lifetime exposure to a pollutant. These slope factors are based on epidemiological studies and are different values for different pollutants. This allows the estimated inhalation dose to be equated to a cancer risk.

Non-cancer adverse health impacts, acute (short-term) and chronic (long-term), are measured against a hazard index (HI), which is defined as the ratio of the predicted incremental exposure concentration from the project to a published reference exposure level (REL) that could cause adverse health effects as established by OEHHA. The ratio (referred to as the Hazard Quotient [HQ]) of each non-carcinogenic substance that affects a certain organ system is added to produce an overall HI for that organ system. The overall HI is calculated for each organ system. If the overall HI for the highest-impacted organ system is greater than one, then the impact is considered to be significant.

The HI is an expression used for the potential for non-cancer health effects. The relationship for the non-cancer health effects is given by the annual concentration ($\mu g/m^3$) and the REL ($\mu g/m^3$). The acute hazard index was determined using the "simple" concurrent maximum approach, which tends to be conservative (i.e., overpredicts).

The relationship for the non-cancer health effects is given by the following equation:

$$HI = C/REL$$

where,

HI Hazard index; an expression of the potential for non-cancer health effects.

C	Annual average concentration ($\mu g/m^3$) during the 70 year exposure period
REL	The concentration at which no adverse health effects are anticipated.

The chronic REL for DPM was established by the California OEHHA[7] as 5 $\mu g/m^3$. There is no acute REL for DPM. However, diesel exhaust does contain acrolein and other compounds, which do have an acute REL. BAAQMD's DPM speciation table (based on profile 4674 within the U.S. EPA Speciate 4.2)[8] was used to assess the acute impacts. Acrolein emissions are approximately 1.3 percent of the total emissions. The acute REL for acrolein was established by the California OEHHA[9] as 2.5 $\mu g/m^3$.

CUMULATIVE SOURCES

The BAAQMD's *CEQA Air Quality Guidelines* include standards and methods for determining the significance of cumulative health risk impacts. The method for determining cumulative health risk requires the tallying of health risk from permitted sources and major roadways in the vicinity of a project (i.e., within a 1,000-foot radius of the source or new receptor), then adding the project impacts (in this case, construction activities) to determine whether the cumulative health risk thresholds are exceeded.

BAAQMD has developed a geo-referenced database of permitted emissions sources throughout the San Francisco Bay Area, and has developed the *Stationary Source Risk & Hazard Analysis Tool* (dated May 2011) for estimating cumulative health risks from permitted sources. Eight permitted sources are located within 1,000 feet of the fenceline of the proposed project. These sources are listed in **Table 8**.

Information associated with these sources was provided and/or verified by BAAQMD.[10] Information (cancer risks and chronic index) was adjusted for distance from source to receptor, based on BAAQMD's *Distance Adjustment Multiplier for Diesel Internal Combustion Engine* and the *Distance Adjustment Multiplier for Gasoline Dispensing Facilities*. The cancer risks for the dry cleaner stationary source were adjusted to reflect the regulation that Perchloroethylene (PCE) is prohibited from use in the US after 2023. That is, the BAAQMD data were adjusted to 17 percent (12 years of PCE usage over a 70 year lifetime) of the reported value. **Table 8** provides the distance adjustment factors and the screening (unadjusted) cancer risk, hazard impacts, and the $PM_{2.5}$ concentrations. **Table 9** provides the adjusted cancer risk, hazard impacts, and the $PM_{2.5}$ concentrations.

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7 California Office of Environmental Health Hazards Assessment Toxicity Criteria Database, 2010. http://www.oehha.ca.gov//.

8 Provides for a speciation faction of 1.3 percent of acrolein per DPM emission rate. http://www.epa.gov////.html.

9 California Office of Environmental Health Hazards Assessment Toxicity Criteria Database, 2010. http://www.oehha.ca.gov//.

10 Email from Andrea Gordon at BAAQMD on June 13, 2011 and from Jaclyn Winkel on March 14, 2012 - Stationary Source Inquiry Form Request - Brisbane Baylands.

TABLE 8
CUMULATIVE HEALTH IMPACTS – PERMITTED SOURCES
Adjustment Factors and Screening Data

Facility #	Facility Type	Address	Distance to Project (feet)	Adjustment Factor	Cancer Risk	Chronic Impact	PM2.5 Concentration
2902	View Rite	455 Allan Street	795	1	0	0.001	0
G10024	Bayshore Chevron	2690 Bayshore Blvd	150	0.305	13.4	0.022	0
17835	PG&E - Martin	3150 Geneva Avenue	560	1	0	0	0
G2818	Seven Eleven	2700 Bayshore Blvd	170	0.260	28.2	0.047	0
17020	Tiger's Autobody	23 Industrial Way	610	1	0	0	0
9595	Sunquest Properties	Bayshore Blvd & Sunnyvale	0	1	0	0	0
1108	Brisbane Recycling	5 Beatty Road	925	1	0	0	4.88
4021	SFPP	950 Tunnel Avenue	360	1	26.4	0.011	0.007
3520[1]	Leland Cleaners	151 Leland Avenue	380	1	37.5	0.10	0
13872	Super Tech Body Shop	370 Industrial Way	665	1	0	0.003	0
18394	InterMune	3260 Bayshore Blvd	650	0.08	23.5	0.008	0.005
5691	Sunquest Properties	Brisbane Landfill	900	1	54.5	0.103	0.479
4173[2]	Recology Sunset	501 Tunnel Avenue	1,400/200[3]	1	47.8	0.017	92.1
4173[4]	Recology Sunset	501 Tunnel Avenue	1,400/200[3]	1	14.1	-	0.044

1 HRSA# 19700 (dated March 24, 1999)
2 HRSA#7759 (dated September 1, 2003)
3 Located approximately 1,400 feet from Phase I residences but 200 feet from existing residences
4 HRSA#9302 (dated July 29, 2004)

TABLE 9
CUMULATIVE HEALTH IMPACTS – PERMITTED SOURCES
Adjusted and Refined Data

Facility #	Facility Type	Address	Cancer Risk	Chronic Impact	PM2.5 Concentration
2902	View Rite	455 Allan Street	0	0.001	0
G10024	Bayshore Chevron	2690 Bayshore Blvd	4.07	0.0067	0
17835	PG&E - Martin	3150 Geneva Avenue	0	0	0
G2818	Seven Eleven	2700 Bayshore Blvd	7.32	0.0121	0
17020	Tiger's Autobody	23 Industrial Way	0	0	0
9595	Sunquest Properties	Bayshore Blvd & Sunnyvale	0	0	0
1108	Brisbane Recycling	5 Beatty Road	0	0	4.88
4021	SFPP	950 Tunnel Avenue	0.17	0.011	0.0005
3520	Leland Cleaners	151 Leland Avenue	6.38	0.10	0
13872	Super Tech Body Shop	370 Industrial Way	0	0.003	0
18394	InterMune	3260 Bayshore Blvd	1.88	0.001	0.001
5691	Sunquest Properties	Brisbane Landfill	54.5	0.103	0.479
4173	Recology Sunset	501 Tunnel Avenue	0.99	0.017	0.003
4173	Recology Sunset	501 Tunnel Avenue	14.1	0	0.044

Note: Facility # 17020, 9595, 1108, 13872, and 5691 will be removed as part of the project.

The following pertain to some of the cumulative permitted sources near and on the project site:

- Tiger's Autobody and Super Tech Body Shop are current operations on Industrial Way which will be removed as part of the project (i.e., was not included as a cumulative source).

- Sunquest Properties at Bayshore Boulevard and Sunnydale Avenue is the Visitacion Valley Mixed Use Residential project (City of San Francisco) at the former Schlage Lock site.
- Santa Fe Pacific Pipeline (SFPP) is the Kinder Morgan Tank Farm site, which will remain in place after the project. The facility is used as a storage and transfer facility – fuel supply is ordered, comes into the tank farm and either goes out to SFO (jet fuel) or tanker trucks come in to retrieve (i.e., gasoline, diesel) and deliver to local facilities such as gas stations.
- Brisbane Recycling, construction materials recycling and rock crushing operations, will be removed as part of the project (i.e., was not included as a cumulative source). There is also an interim soils processing operation next to the Brisbane Recycling that will also be removed as part of the project (i.e., was not included as a cumulative source).
- Sunquest Properties Brisbane Landfill was closed in the early 1960s. Current activities include remediation under the oversight of the Regional Water Quality Control Board. The Landfill will be removed as part of the project (i.e., was not included as a cumulative source).

Interstate 101 (Bayshore Freeway) located adjacent (to the east of the project) and nearby the project (approximately 1,500 feet from the project). Thus, the health impacts from this roadway were not included in the cumulative analysis. BAAQMD has also developed a geo-referenced database of roadways throughout the San Francisco Bay Area and has developed the *Highway Screening Analysis Tool (*dated May 2011*)* for estimating cumulative health risks from roadways.

BAAQMD *CEQA Air Quality Guidelines* also require the inclusion of surface streets within 1,000 feet of the project with annual average daily traffic (AADT) of 10,000 or greater[11]. Upon review the health impacts from Geneva Avenue with 18,900 AADT and located within 150 feet of the project site was be included. Bayshore Boulevard with 25,800 AADT and located within 150 feet of the project site was included in the analysis. **Table 10** provides the cancer risk, hazard impacts, and the $PM_{2.5}$ concentrations for the nearby surface streets.

TABLE 10
CUMULATIVE HEALTH IMPACTS - ROADWAYS

Roadway	Cancer Risk	Hazard Impact	PM2.5 Concentration
Geneva Avenue	2.74	0.02	0.09
Bayshore Boulevard	3.17	0.02	0.16

[11] BAAQMD County Surface Street Screening Tables, May 2011 and CEHTP Traffic Linkage Service Demonstration, http://www.ehib.org/traffic_tool.jsp